



The association between income and leisure-time physical activity is moderated by utilitarian lifestyles: A nationally representative US population (NHANES 1999–2014)

Lisa Kakinami^{a,b,*}, Rita Wissa^a, Rahid Khan^c, Gilles Paradis^d, Tracie A. Barnett^{e,f}, Lise Gauvin^{g,h}

^a Department of Mathematics and Statistics, Concordia University, 1455 de Maisonneuve Blvd West, Montreal, QC H3G 1M8, Canada

^b PERFORM Centre, Concordia University, 7200 Sherbrooke St West, Montreal, QC H4B 1R6, Canada

^c Department of Economics, Concordia University, 1455 de Maisonneuve Blvd West, Montreal, QC H3G 1M8, Canada

^d Department of Epidemiology, Biostatistics and Occupational Health, McGill University, 1020 Pine Ave West, Montreal, QC H3A 1A2, Canada

^e Centre de recherche du CHU Sainte-Justine, 5757 Ave Decelles, Montréal, QC H3S 2C3, Canada

^f INRS-Armand-Frappier Institute, 531 Boul des Prairies, Laval, QC H7V 1B7, Canada

^g Research Centre of the Centre Hospitalier de l'Université de Montréal (CRCHUM), 900 St Denis St, Montreal, QC H2X 0A9, Canada

^h École de santé publique, Université de Montréal (ESPUM), PO Box 6128, Downtown Station, Montreal, QC H3C 3J7, Canada

ARTICLE INFO

Keywords:

Socioeconomic status

Physical activity

NHANES

Poverty income ratio

ABSTRACT

The objective of this study was to determine whether the relationship between income and leisure-time physical activity (LTPA) persists after accounting for a person's utilitarian PA (all non-LTPA), sociodemographic characteristics and transportation PA. Data were from eight cycles (1999–2014) of the nationally representative samples of the US adult population from the National Health and Nutrition Examination Survey ($n = 35,239$). Whether the poverty income ratio (0–1.3, 1.3–1.86, 1.86 + [reference]) was associated with minutes of LTPA (moderate, vigorous) after stratifying for utilitarian PA (sedentary, light, moderate, and vigorous) was assessed in multiple linear regressions adjusted for age, sex, race, education, marital status, weight status, hours worked, and minutes of transportation-related PA in the past week. Likelihood of meeting national physical activity recommendations was also assessed in multiple logistic regressions adjusting for the covariates described. For both sedentary and light utilitarian PA levels, compared to the reference, persons living in households of the lowest poverty income ratio were consistently associated with approximately 17–30 less minutes of moderate LTPA minutes per week, and 20–25 less minutes of vigorous LTPA across all survey cycles. Compared to the reference, the likelihood of meeting national PA recommendations was approximately 31–55% less for these households. The known association between lower income and lower LTPA persist, but is the most persistent and consistent for those with less active utilitarian (such as sedentary) lifestyles. Interventions aimed at increasing LTPA among people with low income and sedentary utilitarian lifestyles whether or not they are in the workforce are particularly needed.

1. Introduction

For adults, a minimum of 150 min of moderate-to-vigorous physical activity (PA) per week is recommended (Strath et al., 2013; U.S. Department of Health and Human Services, 2008), and is inversely associated with chronic diseases (Warburton et al., 2010; Kruk, 2007; Booth et al., 2012). Yet the proportion meeting recommendations is low (Caban-Martinez et al., 2007), and those of lower socioeconomic status (SES) are disproportionately affected (Elhakeem et al., 2015; Ford et al.,

1991; Seiluri et al., 2011). Previous studies indicate that specific PA domains such as leisure time physical activity (LTPA), among others (such as occupational and transportation) all contribute to overall PA (Chu and Moy, 2013). However, different patterns of involvement across PA domains have been noted in the literature: some studies suggest that individuals with greater occupation-related PA also have less LTPA (Makinen et al., 2010), whereas other studies show no such association (Vandelandotte et al., 2015). As persons of lower SES are more likely to be employed in physically demanding jobs (Caban-

Abbreviations: BMI, body mass index; LTPA, leisure time physical activity; MV-LTPA, moderate-to-vigorous leisure time physical activity; NHANES, National Health and Nutrition Examination Survey; PA, physical activity; PIR, poverty to income ratios; SES, socioeconomic status

* Corresponding author at. Department of Mathematics and Statistics in Collaboration with the PERFORM Centre, Concordia University, 1455 Blvd de Maisonneuve West, Montreal, Quebec H3G 1M8, Canada.

E-mail address: lisa.kakinami@concordia.ca (L. Kakinami).

<https://doi.org/10.1016/j.ypmed.2018.05.013>

Received 12 January 2018; Received in revised form 23 April 2018; Accepted 9 May 2018

Available online 16 May 2018

0091-7435/ © 2018 Elsevier Inc. All rights reserved.

Martinez et al., 2007; Salmon et al., 2000; Van Domelen et al., 2011), not accounting for occupational-related PA when assessing the link between low SES and LTPA may be introducing measurement error into the estimates. Indeed, the studies that have assessed the link between SES and LTPA after accounting for occupational-related PA have shown mixed findings (Salmon et al., 2000; Wolin and Bennett, 2008; Finger et al., 2012).

While accounting for occupation-related PA may help to better clarify associations as a function of different domains of overall energy expenditure, it might also introduce bias. In particular, although previous studies utilized representative samples, they were restricted to currently employed participants. As total PA can be accumulated throughout the day, accounting for only occupation-related PA excludes those who are unemployed, thereby considerably narrowing the study sample. Indeed an estimated one-third of the general adult population is not currently employed (e.g., students, unemployed, retired, at-home parents, etc.) (U.S. Census Bureau, 2013) and including them into the study sample is critical to improving the precision and generalizability of the association between SES and LTPA estimates. Utilitarian PA (comprised of all non-LTPA and non-transportation PA) during the day may be a better reflection of daily non-LTPA than a fragmented section such as occupation-related PA. Thus the objective of this study was to determine whether the relationship between SES and LTPA persists after accounting for a person's utilitarian PA. Study results will help determine whether the SES and LTPA association is uniform across utilitarian PA groups, or whether certain groups are particularly vulnerable to lower LTPA and should be targeted in educational efforts and public health messaging.

2. Methods

2.1. Data source

Data were from the National Health and Nutrition Examination Survey (NHANES), a bi-annual survey of a nationally representative sample of the US adult population. The 1999–2014 data collection cycles were used for this analysis ($n = 82,091$). Pregnant women ($n = 1597$), and those missing data on the variables of interest were excluded ($n = 7138$). In addition, occupational history was only measured in those at least 20 years of age, thus participants < 20 years of age ($n = 38,117$) were excluded, resulting in an eligible sample of 35,239 participants. Approval for NHANES was obtained from the National Center for Health Statistics Ethics Review Board. Informed consent was acquired from all adults.

2.2. Measures

2.2.1. Annual income

The previous year's annual household income was self-reported by participants. Income was compared to the poverty guidelines released by the Department of Health and Human Services to calculate poverty to income ratios (PIR). The PIR adjusts for household size and geographic region, and is used to determine eligibility for government programs and assistance. As these guidelines are released annually, using the PIR additionally adjusts for inflation over the 16 years of data collection. Thresholds vary by state, but a PIR < 1.86 may be eligible for government assistance. Thus, for this analysis PIR was categorized into three groups: 0–1.3, 1.3–1.85, and ≥ 1.86 (reference). These categorizations are consistent with the literature and the poverty guidelines (Gundersen et al., 2012; Schanzenbach, 2009).

2.2.2. Utilitarian PA

Activity levels as part of a person's non-LTPA lifestyle were reported in all data cycles. Participants were informed to answer these questions specific to work and chores only; their LTPA was measured in a different set of subsequent questions. As the utilitarian PA measures

differed between the 1999–2006 and the 2007–2014 cycles, they will be described and assessed separately.

For the 1999–2006 cycles, participants reported which of four response options best reflected their utilitarian PA. Daily activities were defined as work, housework, going to and attending classes, and activities done throughout the normal part of the day. Response options included (a) sits during the day and does not walk about very much; (b) stands or walks about quite a lot during the day, but does not have to carry or lift things very often; (c) lifts or carries light loads or climbs stairs or hills often; and (d) carries heavy loads. These were categorized into sedentary, light, moderate, and vigorous-intensity lifestyles, respectively.

For the 2007–2014 cycles, participants reported their frequency and duration of moderate and vigorous activity done in a typical week for paid and unpaid work, household chores and yard work. Moderate-intensity activity was defined as, “small increases in breathing rate such as brisk walking or carrying light loads for at least 10 min continuously”, and vigorous-intensity activity was defined as, “large increases in breathing or heart rate and is done for at least 10 min continuously”. Participants who reported neither moderate-intensity nor vigorous-intensity utilitarian lifestyle activities were categorized as having sedentary lifestyles. Participants who reported only moderate-intensity, or only vigorous-intensity were categorized with moderate and vigorous lifestyles, respectively. Participants who reported both moderate-intensity and vigorous-intensity activities were categorized as having moderate-and-vigorous utilitarian lifestyles.

2.2.3. Leisure-time physical activity (LTPA)

Frequency and duration of moderate-intensity (“light sweating or moderate increases in breathing or heart rate”) and vigorous-intensity (“heavy sweating or large increases in breathing or heart rate”) LTPA were collected in all data cycles. Participants were asked to exclude the activities they had previously reported for their utilitarian lifestyles, thus to only report the leisure-time physical activities that were sustained for at least 10 min at a time. For the 1999–2006 cycles, participants reported their activities in the context of the past 30 days; for the 2007–2014 cycles, participants reported their activities in the context of a typical week. In accordance with the International Physical Activity Questionnaire recommendations, LTPA minutes ≥ 180 min/day were truncated to 180 min/day (International Physical Activity Questionnaire, 2005).

The total weekly minutes of each of moderate and vigorous LTPA were calculated. Moderate-intensity and vigorous-intensity LTPA were considered separately and also combined (MV-LTPA). Participants who reported at least 150 min/week of moderate-intensity LTPA, 75 min/week of vigorous-intensity LTPA, or 150 min/week of MV-LTPA were identified as meeting the national recommendations for LTPA.

2.2.4. Transportation PA and hours worked

Usual minutes of active-commuting PA (based on frequency and duration of walking and/or cycling for travel), and hours worked in the past week were also collected. While the wording of the hours worked in the past week was identical across all survey cycles, the active-commuting PA variables differed between the 1999–2006 and the 2007–2014 cycles. More specifically, for the 1999–2006 cycles, the respondent indicated the frequency and duration of actively commuting (walked or bicycled), while the 2007–2014 cycles further specified that the active commuting must have been conducted continuously for at least 10 min at a time. In addition, the 1999–2006 cycles were on the timescale of the past 30 days, while the 2007–2014 cycles' timescale were in the past week. The items were re-scaled to a weekly average to be consistent across survey cycles.

2.3. Covariates

Demographic characteristics (sex, age, race/ethnicity, marital status) and highest level of education completed were self-reported.

Download English Version:

<https://daneshyari.com/en/article/8693471>

Download Persian Version:

<https://daneshyari.com/article/8693471>

[Daneshyari.com](https://daneshyari.com)