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Levels of physical activity among adults 18–64 years old in 28 European countries

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ABSTRACT

Background. Sedentary lifestyle is associated with more than three million deaths annually. Data from the 2013 Eurobarometer survey were analyzed to assess levels of physical activity across the European Union (EU) and to explore factors associated with adequate and high physical activity.

Methods. A representative sample of $n = 19{,}978$ individuals aged 18–64 years from the 28 EU countries (sub-sample of the Eurobarometer survey, wave 80.2) was analyzed. Frequency and average duration of walking, moderate and vigorous physical activity was assessed with a self-reported questionnaire. Participants were then classified as physically inactive or adequately/highly active, based on the World Health Organization's (WHO) recommendations. The total amount of MET-minutes (MET-min) per week was also calculated for each respondent.

Results. The proportion of physically inactive individuals was 28.6%, (12.4% in Sweden to 53.7% in Cyprus), while 59.1% of the respondents (37.9% in Portugal and Cyprus to 72.2% in Sweden) were classified as highly active. The mean total weekly physical activity was 2151 MET-min (95%CI: 2095–2206), of which 891 MET-min (95%CI: 858–924) were contributed by vigorous exercise, 559 MET-min (95%CI: 540–578) by moderate exercise (excluding walking) and 690 MET-min (95%CI: 673–706) by walking. Male gender, younger age, residence in rural areas and Northern Europe, higher education level and ability to pay bills were independently associated with higher physical activity.

Conclusion. One fourth of the EU population did not meet the WHO's recommendations for physical activity, with wide inequalities between and within countries. Wide-reaching environmental approaches are required to promote physical activity and address these inequalities.

Introduction

Sedentary lifestyle is aetiologically associated with more than 3 million deaths annually and reduces life expectancy by 0.68 years (Cornelissen and Fagard, 2005; Lim et al., 2012). Despite the well-established health benefits of physical activity (World Health Organization, 2007, 2011) 28.2% of men and 34.4% of women aged ≥15 years worldwide are estimated to be physically inactive (World Health Organization, 2011). However, in high income countries, the proportions are estimated as high as 41% and 48% respectively (Mendis et al., 2011; World Health Organization, 2010).

According to the World Health Organization's (WHO) guidelines concerning physical activity, adults aged 18–64 years should do at least 150 min of moderate-intensity aerobic physical activity throughout the week, or do at least 75 min of vigorous-intensity aerobic physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity (World Health Organization, 2010).

Europe-wide data on physical activity levels of the population are available for children and adolescents (Currie et al., 2008), but not so much for adults. Country-specific studies (Borodulin et al., 2015; Filippidis et al., 2014; Ng et al., 2011; Salanave et al., 2012; Wallmann-Sperlich and Froboese, 2014), as well as international comparisons with limited number of European countries (Bauman et al., 2009; Demarest et al., 2014) have been conducted, while studies that included all member countries of the European Union (EU) have focused on either leisure-time (Van Tuyckom et al., 2013) or sports physical activity only (Van Tuyckom et al., 2010). Differences in sampling and methods of assessment of physical activity limit comparability between studies. Therefore, we conducted a secondary analysis of cross-sectional data from the 2013 Eurobarometer survey in order to assess the levels of physical activity across the EU and to explore socio-demographic factors associated with adequate and high levels of activity, according to the WHO's recommendations.

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Methods

Data source

We analyzed data from the Eurobarometer survey, wave 80.2 (European Commission, 2014). Data were collected in November–December 2013 and the total sample consisted of $n = 27{,}919$ individuals from the 28 EU member countries. A representative sample of residents aged ≥15 years was selected through a multi-stage sampling design in each of the 28 countries. Respondents were selected from households with probability proportional to population size and density. Interviews were conducted in people's homes and in the language of each country. For the present study analysis was restricted to individuals 18–64 years old.

Measures

Sociodemographic data

Data were collected on respondents' gender (male; female), age (15–24; 25–39; 40–54; or ≥55 years); area of residence (rural area or village; town); education level attained, which was measured in the survey as age at completion of full-time education (≤15; 16–19; or ≥20 years); frequency at which respondents reported experiencing difficulty paying monthly bills–a proxy for income ("most of the time"; "from time to time"; "almost never/never").

Member countries were grouped into four sub-regions, based on the United Nations geoscheme (United Nations Statistics Division): Southern Europe (Croatia, Greece, Italy, Malta, Portugal, Slovenia, Spain, and Republic of Cyprus), Western Europe (France, Belgium, Austria, Germany, The Netherlands, Luxembourg), Northern Europe (Denmark, Ireland, United Kingdom, Latvia, Lithuania, Estonia, Finland, Sweden), and Eastern Europe (Slovakia, Czech Republic, Hungary, Poland, Bulgaria, Romania).

Physical activity

Frequency and duration of three types of physical activity were assessed: vigorous activity, moderate activity (excluding walking) and walking. Frequency was assessed with the questions "In the last 7 days, on how many days did you do vigorous physical activity like lifting heavy things, digging, aerobics or fast cycling?"; "In the last 7 days, on how many days did you do moderate physical activity like carrying light loads, cycling at normal pace or doubles tennis? Please do not include walking"; and "In the last 7 days, on how many days did you walk for at least 10 min at a time?". Respondents were asked to report a number of days between zero and seven. Duration of each type of physical activity was assessed with the question "In general, on days when you do [type of activity], how much time in total do you usually spend at it?". Response options included 30 min or less; 31 to 60 min; 61 to 90 min; 91 to 120 min; more than 120 min; never do [type of activity]; don't know. These are slightly modified questions derived from the International Physical Activity Questionnaire (IPAQ), which has been validated in several settings (Lee et al., 2011).

In order to compare the reported physical activity to the WHO's guidelines, the total time spent walking, doing moderate and vigorous activity was calculated for each individual, by multiplying the number of days during which they engaged in each type of activity with the amount of time they usually spend when doing such activities. To simplify calculations, an answer of "30 min or less" was assumed to mean 15 min, an answer of "31 to 60 min" was assumed to mean 45 min, "61 to 90 min" 75 min, "91 to 120 min" 105 min and "more than 120 min" 120 min.

Individuals who reported at least 150 min of moderate physical activity – including walking – or at least 75 min of vigorous activity per week, or an equivalent combination of moderate and vigorous activity and therefore met the WHO's guidelines for physical activity, were classified as doing adequate physical activity. Those who reported at least 300 min of moderate physical activity, or at least 150 min of vigorous activity per week, or an equivalent combination of moderate and vigorous activity, were classified as reporting high levels of physical activity (World Health Organization, 2010).

We also used metabolic equivalents of task (METs) to estimate total physical activity per week. Each type of activity was assigned a MET value (Ainsworth et al., 2011), based on energy expenditure estimates used in the IPAQ (The IPAQ Group). Energy expenditure of walking was estimated at 3.3 METs, other moderate activity at 4 METs and vigorous activity at 8.0 METs. The total amount of MET-minutes (MET-min) per week was calculated for each respondent, according to reported time spent walking and doing moderate or/and vigorous physical activity.

Statistical analysis

Analysis was restricted to individuals aged 18–64 years. Proportions are presented as %, with 95% confidence interval (95% CI). Multivariate logistic regression models assessing determinants of adequate (compared to physical inactivity) and high levels (compared to non-high levels) of physical activity were fitted. Independent variables included age; education; geographic region; area of residence; and difficulty in paying bills. Results are presented as adjusted odds ratios (aOR) with 95% confidence interval (95% CI). Total MET-minutes are presented as mean value with 95% CI. A linear regression model, including the same independent variables as above, was fitted to explore associations between sociodemographic variables and the total amount of MET-minutes of physical activity reported by respondents. Data were weighted to ensure nationally representative estimates, and analyses were performed with Stata 12.0.

Results

After excluding individuals younger than 18 or older than 64 years, a final sample of 19,978 was analyzed. In all 28 EU countries the proportion of physically inactive individuals was 28.6% (95% CI: 27.6%–29.6%), while 71.4% (95% CI: 70.4%–72.4%) were classified as adequately active according to WHO's guidelines. Furthermore, 59.1% (95% CI: 58.0%–60.2%) of participants were classified as highly active. There was great variability between countries with the highest proportion of inactive individuals noted in Southern European countries, such as Cyprus (53.7%), Portugal (50.6%) and Malta (48.7%), and the lowest proportion in Northern and Western Europe, namely in Sweden, (12.4%), the Netherlands (14.9%) and Finland (15.9%). Sweden (72.2%), Germany (71.5%) and Latvia (71.4%) presented with the highest proportion of highly active individuals (Table 1).

The mean total weekly physical activity in the EU was 2151 MET-min (95% CI: 2095–2206), of which 891 MET-min (95% CI: 858–924)

Table 1
Proportion of individuals aged 18–64 years classified as physically inactive, adequately and highly active in the European Union, 2013.

Country	Physically inactive % (95% CI)	Adequately active* % (95% CI)	Highly active % (95% CI)
Southern Europe			
Croatia	21.6 (18.7–24.5)	78.4 (75.5–81.3)	67.0 (63.7–70.3)
Cyprus	53.7 (48.3–59.1)	46.3 (40.9–51.7)	37.9 (32.6–43.2)
Greece	38.1 (34.6–41.6)	61.9 (58.4–65.4)	48.5 (44.9–52.2)
Italy	47.4 (43.8–51.0)	52.6 (49.0–56.2)	41.9 (38.3–45.5)
Malta	48.7 (42.4–55.1)	51.3 (44.9–57.6)	41.8 (35.4–48.2)
Portugal	50.6 (46.9–54.4)	49.4 (45.6–53.1)	37.9 (34.3–41.6)
Slovenia	28.5 (25.2–31.8)	71.5 (68.2–74.8)	59.5 (55.9–63.1)
Spain	20.3 (17.4–23.1)	79.7 (76.9–82.6)	68.5 (65.3–71.8)
Western Europe			
Austria	23.6 (20.5–26.7)	76.4 (73.3–79.5)	64.3 (60.8–67.9)
Belgium	32.0 (28.7–35.3)	68.0 (64.7–71.3)	52.3 (48.7–55.9)
France	29.5 (26.0–32.9)	70.5 (67.1–74.0)	57.8 (54.1–61.5)
Germany	16.1 (13.5–18.7)	83.9 (81.3–86.5)	71.5 (68.4–74.7)
Luxembourg	17.8 (13.6–21.9)	82.2 (78.1–86.4)	67.1 (61.8–72.5)
The Netherlands	14.9 (12.1–17.7)	85.1 (82.3–87.9)	71.0 (67.3–74.6)
Nothern Europe			
Denmark	17.6 (14.4–20.7)	82.4 (79.3–85.6)	66.6 (62.6–70.6)
Estonia	20.0 (16.8–23.1)	80.0 (76.9–83.2)	70.6 (67.0–74.2)
Finland	15.9 (12.7–19.1)	84.1 (80.9–87.3)	66.5 (62.3–70.8)
Ireland	24.8 (21.3–28.3)	75.2 (71.7–78.7)	58.5 (54.4–62.5)
Latvia	19.4 (16.6–22.1)	80.6 (77.9–83.4)	71.4 (68.2–74.5)
Lithuania	24.3 (21.2–27.5)	75.7 (72.5–78.8)	63.6 (60.0–67.1)
Sweden	12.4 (9.6–15.3)	87.6 (84.7–90.4)	72.2 (68.2–76.2)
United Kingdom	24.2 (20.8–27.5)	75.8 (72.5–79.1)	64.1 (60.3–67.9)
Eastern Europe			
Bulgaria	33.3 (29.8–36.9)	66.7 (63.1–70.2)	57.4 (53.6–61.3)
Czech Republic	27.2 (24.0–30.3)	72.8 (69.7–76.0)	60.2 (56.7–63.7)
Hungary	32.8 (29.3–36.2)	67.2 (63.8–70.7)	52.7 (49.1–56.4)
Poland	44.0 (40.0–47.9)	56.0 (52.1–60.0)	43.2 (39.2–47.2)
Romania	27.9 (24.3–31.6)	72.1 (68.4–75.7)	59.8 (55.8–63.8)
Slovakia	28.1 (24.9–31.4)	71.9 (68.6–75.1)	57.7 (54.0–61.3)
28 EU countries	28.6 (27.6–29.6)	71.4 (70.4–72.4)	59.1 (58.0–60.2)

* Meeting WHO's guidelines.