Adult physical inactivity prevalence in the Muslim world: Analysis of 38 countries

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ABSTRACT

Objective. Physical inactivity surveillance informs policy and treatment options toward meeting the World Health Organization's (WHO) goal of a 10% reduction in its prevalence by 2025. We currently do not know the aggregate prevalence for Muslim-majority countries, many of which have extremely high rates of comorbidities associated with physical inactivity.

Method. Based on data for 163, 556 persons in 38 Muslim countries that were collected by the Global Physical Activity Questionnaire and the International Physical Activity Questionnaire, unweighted and weighted physical inactivity prevalence estimates were calculated. I used two-proportion Z tests to determine gender and ethnic differences within the sample and between the sample and 94 non-Muslim countries and odds ratios to determine the magnitude of significant differences.

Results. Total physical inactivity prevalence was 32.3% (95% CI: 31.9, 32.7). Prevalence among males and females was 28.8% and 35.5%, respectively. Prevalence among non-Arabs and Arabs was 28.6% and 43.7%, respectively. Females and Arabs were more likely physically inactive than their respective counterparts [OR = 1.36 (1.33, 1.39) and OR = 1.94 (1.90, 1.98)]. Muslim countries were more likely physically inactive [OR = 1.23 (1.22, 1.25)] than non-Muslim ones, which was primarily due to the influence of Arabs [OR = 2.01 (1.97, 2.04)], and in particular female Arabs [OR = 2.22 (2.17, 2.27)].

Conclusion. Physical inactivity prevalence in the Muslim world is higher than non-Muslim countries and the difference is primarily due to higher rates among Arabs.

Introduction

Physical inactivity among adults threatens global public health as it is a prime behavioral risk factor associated with major non-communicable diseases such as coronary heart disease, type 2 diabetes, and breast and colon cancer (Lee et al., 2012). Its long-term impacts increasingly burden national economies (World Economic Forum, 2011). Decreasing its prevalence is paramount toward decreasing premature mortality and restoring healthy populations. In its most recent iteration of a global action plan for the prevention of non-communicable diseases, the World Health Organization (2013) established voluntary global targets to reduce physical inactivity by 10%. Contained in the report is an imperative to monitor determinants of non-communicable disease, which include physical inactivity.

The WHO maintains a global health data observatory (http://www.who.int/gho/database/en/), which emanated from its 2002–2004 conduct of the World Health Survey of 70 countries. Located in it are the risk factor prevalence values by country for physical inactivity – based on the International Physical Activity Questionnaire (IPAQ). The WHO also provides complementary data through country STEPS reports (http://www.who.int/chp/steps/reports/en/), which resulted from the uniform measurement of physical activity using the Global Physical Activity Questionnaire (GPAQ) (http://www.who.int/chp/steps/Instrument_at_a_glance.pdf?ua=1). These data have been subsequently analyzed according to various geographic permutations.

Hallal et al. (2012) performed the largest analyses to date of the WHO observatory dataset and estimated that adult (i.e., aged ≥ 15 years) physical inactivity among 122 countries is 31.1%. Analyses of data subsets have revealed physical inactivity prevalence of 17.7% among 51 countries worldwide (Guthold et al., 2008), while in 22 African countries, 20.9% did not meet WHO minimum recommendations for physical activity (i.e., 600 MET-minutes per week) (Guthold et al., 2011). The International Prevalence Study (Bauman et al., 2009) surveyed physical activity among 20 countries using the IPAQ and found that physical inactivity prevalence ranged between 6.9% (China) to 43.0% (Belgium). Results of the Special Eurobarometer Wave 58.2 of 15 European Union countries revealed that physical inactivity prevalence ranged between 19.3% (Netherlands) and 43.1% (France) (Sjöströöm et al., 2006). Dumith et al. (2011) merged the aforementioned data sets and found physical inactivity prevalence among 76 countries of 17.4%. Ranasinghe et al. (2013) reviewed 11 research studies and 11 STEPS surveys conducted in 6 South Asian countries

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over 8 years and found that physical inactivity prevalence ranged between 5.5% (Nepal) and 58.6% (Bhutan).

Currently, no published systematic analysis of physical inactivity prevalence among Muslim-majority countries exists. Existing literature is concentrated on Arab countries, which represent less than half of all Muslim nations. A review of adult physical activity among 5 countries of the Arabian Gulf region revealed physical inactivity prevalence as high as 61.0% and 73.7% for males and females, respectively (Mabry et al., 2009). These findings are of concern because heart disease and stroke – morbidities associated with physical inactivity – were two of the top five causes of death in Arab countries in 2010 regardless of income level (Abdul Rahim et al., 2014).

Islam considers health second in importance only to faith and holds that an individual, society, and the state share responsibilities for health promotion (Al-Khayat, 2004). This view is supported within Islamic scripture. For example, in the Tirmidhi *Hadith*, it is told that passage to heaven is partially contingent on accounting for how one safeguarded his or her health over a lifetime. Further, the Prophet Mohammed – whose behavior Muslims are to emulate – led a physically active life by engaging in running, horse racing, wrestling, archery, and swimming (Malik, n.d.). Exegeses such as these justify focusing physical activity health promotion efforts on behalf of the entire religion. To date, however, pan-Islamic physical inactivity data have not been reported. Doing so can potentially galvanize religion-specific agencies (e.g., Islamic Relief Worldwide, Organization of Islamic Cooperation) to fund efforts aimed at decreasing physical inactivity. Therefore the purpose of the current study was (a) to calculate prevalence of physical inactivity across all Muslim countries, (b) to compare prevalence by gender within and ethnicity between Muslim countries, and (c) to compare prevalence between Muslim and non-Muslim countries overall (i.e., religion), by gender, and by ethnicity.

Method

Sample

A country was considered Muslim if its Muslim population constituted ≥50% of its total 2010 population. Based on the Pew Research Religion and Public Life Project (www.pewforum.org/2011/01/27/table-muslim-population-growth-by-country), 47 countries met this criterion and included the Palestinian territories. As of August, 2014 physical inactivity prevalence data could not be located for the countries of Azerbaijan, Brunei, Djibouti, Kosovo, Kyrgyzstan, Somalia, Tajikistan, Turkmenistan, and Yemen. Thus, the final sample constituted 38 countries and was equally split between Arab (i.e., Arab League members) and non-Arab countries. A total of 94 non-Muslim countries comprised the comparative world sample (see Supplementary file for list) and included all countries for which age-standardized physical inactivity prevalence and sample sizes were reported.

Instruments

The IPAQ was piloted during 1998–1999, which resulted in multiple short (9 items) and long (27 items) versions of the questionnaire that could be administered by telephone or self-administration (Craig et al., 2003). Subsequently, a reliability and validity study was carried out in 2000 in English among 12 countries located in 6 continents (Craig et al., 2003). Results indicated that comparable data were obtained regardless of form length, administration mode, and reference periods (Craig et al., 2003). In the following years, the IPAQ (http://www.ipaq.ki.se/) was adapted for speakers of Arabic, Farsi, French, Malay, and Turkish. These languages along with English constitute official languages of 32 of the 38 countries in the study. Developers of the IPAQ "place great emphasis on developing and creating measures that have high levels of cultural equivalence so we can compare measures and results between countries" (http://www.ipaq.ki.se/cultural.htm).

They recommend standardized procedures (e.g., 4 steps when translating and back-translating, 4 specific questions to ask after a person completes each item, 2 specific questions to ask at the end of the survey) in order to ensure conceptual, metric, and linguistic equivalence.

The GPAQ was conceptualized as drawing on the strengths of the IPAQ and consists of 19 questions that measure domain-specific physical activity (i.e., work, transport, leisure) (Bull et al., 2009). Measurement properties of the GPAQ were tested during 2003–2005 in 9 countries, 2 of which – Bangladesh and Indonesia – were also included in the present study (Bull et al., 2009). Pooled kappa coefficients of 0.73 and 0.68 were obtained for sedentary (i.e., physical inactivity) behavior in the work and leisure domains, respectively (Bull et al., 2009). Concurrent validity between GPAQ and IPAQ was also assessed. A correlation of 0.65 was obtained for sedentary behavior between the two instruments, which reflected the use of an identically-worded question with correlations higher for women than for men and for urban than for rural dwellers (Bull et al., 2009). Pooled kappa (0.22) for physical inactivity showed a low correlation between the two instruments although the percentage of agreement was high (85.2%) (Bull et al., 2009).

Physical inactivity definition and data sources

The WHO defines physical inactivity prevalence as the "percent of defined population attaining less than 5×30 min of moderate activity per week, or less than 3×20 min of vigorous activity per week, or equivalent" (http://apps.who.int/gho/indicatorregistry/App_Main/view_indicator.aspx?iid=2381). Age-standardized values for males, females, and total population ≥ 15 years old were extracted from the WHO Global Health Observatory Data Repository (http://apps.who.int/gho/data/node.main.A893?lang=en). These values represent self-reported and aggregated domestic, occupational, transportation, and leisure-time domains of physical activity using the IPAQ (Craig et al., 2003), GPAQ (Bull et al., 2009), or a similar instrument. When a value was not reported for a particular country, the WHO STEPS country reports were consulted for physical inactivity prevalence (http://www.who.int/chp/steps/reports/en/). For countries not listed in either source, electronic searches were conducted of population-based surveys of physical inactivity in PubMed and in a country's pertinent governmental websites. Subsequently, estimates were obtained for Afghanistan (Islam and Rasooly, 2012), Albania (Shapo et al., 2004), Morocco (Najdi et al., 2011), and Uzbekistan (Mishra et al., 2006). Data for non-Muslim countries were extracted from the same sources as well as from relevant publications (Guthold et al., 2008; Bauman et al., 2009).

Data analysis

Individual country unweighted prevalence data were entered into IBM SPSS Statistics 21. Weighted physical inactivity prevalence was calculated for the Muslim sample by the formula:

$$p = \sum_{k=1}^{38} p_k w_k \tag{1}$$

where p_k = prevalence estimate of adult physical inactivity of a country (whether that be male, female, total) multiplied by w_k, which is the quotient of N_k = adult population of the country (i.e., male, female, total) divided by N = total adult population across all 38 countries (i.e., male, female, total). Values for a country's adult male, female, and total populations (ages 15–64) represented 2014 estimates found in the World Factbook (http://www.cia.gov). Results were then added across countries to yield an overall prevalence estimate. The same procedures were used to calculate non-Muslim physical inactivity prevalence.