

## Physical Activity in a Randomized Culturally Adapted Lifestyle Intervention



Faiza Siddiqui, MPH,<sup>1</sup> Robert W. Koivula, PhD,<sup>2,3</sup> Azra Kurbasic, PhD,<sup>2</sup>  
Ulf Lindblad, MD, PhD,<sup>4</sup> Peter M. Nilsson, MD, PhD,<sup>1</sup> Louise Bennet, MD, PhD<sup>1,5</sup>

**Introduction:** Middle Eastern immigrants exhibit high levels of physical inactivity and are at an increased risk for Type 2 diabetes. The primary aim of this study was to examine the changes in objectively assessed physical activity levels following a culturally adapted lifestyle intervention program. The secondary aim was to examine the association between objectively assessed physical activity and insulin sensitivity.

**Study design:** RCT conducted over 4 months in 2015.

**Participants:** Iraqi immigrants residing in Malmö, Sweden, exhibiting one or more risk factors for Type 2 diabetes.

**Intervention:** The intervention group ( $n=50$ ) was offered a culturally adapted lifestyle intervention comprising seven group sessions including a cooking class. The control group ( $n=46$ ) received usual care.

**Main outcome measures:** Raw accelerometry data were processed by validated procedures and daily mean physical activity intensity, vector magnitude high-pass filtered (VM-HPF), was inferred. Further inferences into the number of hours/day spent in sedentary (VM-HPF < 48 milli-Gs [mGs] where  $G=9.8 \text{ m/sec}^2$ ) and light- (48– < 163 mGs); moderate- (163– < 420 mGs); and vigorous-intensity ( $\geq 420$  mGs) activities were also calculated (year of analysis was 2016–2017).

**Results:** No difference was observed between the two groups in terms of change over time in VM-HPF. There was a significant increase in the number of hours/day spent in light intensity physical activity in the intervention group compared with the control group ( $\beta=0.023$ , 95% CI=0.001, 0.045,  $p=0.037$ ). The intervention group also increased the time spent in sedentary activities, with the highest VM-HPF (36– < 48 mGs) within the sedentary behavior ( $B=0.022$ , 95% CI=0.002, 0.042,  $p=0.03$ ). Higher VM-HPF was significantly associated with a higher insulin sensitivity index ( $\beta=0.014$ , 95% CI=0.0004, 0.025,  $p=0.007$ ).

**Conclusions:** The findings favor the culturally adapted intervention approach for addressing low physical activity levels among Middle Eastern immigrants. Replacing sedentary time with light-intensity activities could be an achievable goal and will have potential beneficial effects for diabetes prevention among this sedentary group of immigrants.

**Trial registration:** This study was registered at [www.clinicaltrials.gov](http://www.clinicaltrials.gov) NCT01420198.

*Am J Prev Med* 2018;55(2):187–196. © 2018 American Journal of Preventive Medicine. Published by Elsevier Inc. All rights reserved.

From the <sup>1</sup>Department of Clinical Sciences, Lund University, Malmö, Sweden; <sup>2</sup>Genetic and Molecular Epidemiology Unit, Department of Clinical Sciences, Lund University, Malmö, Sweden; <sup>3</sup>Oxford Centre for Diabetes, Endocrinology and Metabolism, Radcliffe Department of Medicine, University of Oxford, Oxford, United Kingdom; <sup>4</sup>Department of Community Medicine/Primary Health Care, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden; and <sup>5</sup>Center for Primary

Health Care Research, Region Skåne and Lund University, Malmö, Sweden

Address correspondence to: Louise Bennet, MD, PhD, Department of Clinical Sciences, Lund University, Building 28, Floor 11, Jan Waldenströms gata 35, 205 02 Malmö, Sweden. E-mail: [louise.bennet@med.lu.se](mailto:louise.bennet@med.lu.se).

0749-3797/\$36.00

<https://doi.org/10.1016/j.amepre.2018.04.016>

## INTRODUCTION

Physical inactivity and hyper-caloric diets are recognized as two of the major environmental factors contributing to the global epidemic of Type 2 diabetes (T2D).<sup>1</sup> Diabetes prevention is therefore largely focused on increasing physical activity (PA) levels and reducing caloric intake in high-risk groups.<sup>2,3</sup> PA is characterized by energy expenditure (EE) over and above the resting metabolic rate,<sup>4</sup> and is a broad concept encompassing occupational, transportation, household, and leisure-time activities. It ranges in intensity from vigorous PA, such as running and aerobic training, to light-intensity activities (LIA), like household work and casual walking, which require much less EE. Another important concept relating to PA is that of sedentary behavior characterized by very low EE activities like watching TV or driving a car. Considering that individuals exhibit different activity patterns, both PA and sedentary behavior should be addressed in health promotion interventions.<sup>5</sup>

There is a general consensus that 30 minutes of moderate-intensity PA for 5 days a week is associated with beneficial health effects.<sup>6</sup> Studies have shown beneficial effects from reduction in sedentary time, especially improvements in glycemic regulation.<sup>7,8</sup> PA, with or without weight loss, is associated with improvements in insulin sensitivity—an important factor in the pathogenesis of T2D and risk of cardiovascular diseases.<sup>9</sup> Increasing the PA levels, particularly among immigrant groups, could be a challenging task in real-life settings. Differences in cultural beliefs regarding PA, poor language skills, effect of gender on engagement in PA, and lack of social support are some of the barriers leading to low PA levels in these groups.<sup>10–12</sup> A number of questionnaires have been developed to measure self-reported PA levels. However, they are prone to information or recall bias and overestimation of desirable PA habits.<sup>13,14</sup> Forming an accurate assessment of PA habits in immigrant groups using questionnaires can be especially challenging owing to differences in understanding of PA-related terms and language barriers. More recently, there has been a shift toward objective measurement of PA using accelerometers, which minimizes bias and accommodates methodologic problems associated with self-reported PA.<sup>15,16</sup>

Middle Eastern immigrants, the largest group of non-European immigrants in Sweden,<sup>17</sup> represent a high-risk group for T2D.<sup>18</sup> In the Impact of Migration and Ethnicity on Diabetes In Malmö (MEDIM) population-based study, prevalence of risk factors such as physical inactivity (71.9% vs 38.6%); overweight (48.2% vs 42.5%); and obesity (37.5% vs 23%) in this group was higher compared with the native Swedes.<sup>18</sup> Moreover, only 17%

of Iraqi-born immigrants were found to be sufficiently active (achieving 150 or more minutes/week of PA) according to objectively measured PA using accelerometers, and a substantial overestimation of PA (71%) was observed with self-reported measures.<sup>14</sup> There is a lack of data on efficacy of lifestyle interventions among non-Western immigrants, particularly Middle Eastern immigrants.

A culturally adapted lifestyle intervention among diabetes-prone Middle Eastern immigrants has shown efficacy in reducing bodyweight and low-density lipoprotein cholesterol and in improving insulin sensitivity in the intervention group (IG) compared with the control group (CG).<sup>19</sup> The aim of the current study, an ancillary study within the MEDIM intervention study, is to examine changes in objectively assessed PA levels in the IG compared to the CG following the culturally adapted lifestyle intervention program. The secondary aim is to examine the association between objectively assessed PA levels and insulin sensitivity.

## METHODS

### Study Population

The MEDIM intervention study, conducted between January and June 2015, was an RCT of Iraqi-born immigrants, aged 30–75 years, living in Malmö and at high risk of T2D. In total, 636 eligible participants were identified from the MEDIM population-based study and were invited to participate in the intervention study via mail. The inclusion criteria were set as one of the following: (1) waist circumference  $\geq 80$  cm in females and  $\geq 94$  cm in males; (2) BMI  $\geq 28$ ; or (3) pre-diabetes with impaired fasting (6.1–6.9 mmol/L) or 2-hour glucose (7.8–11.0 mmol/L) or a combination of both on oral glucose tolerance test.<sup>20</sup> Of 636 eligible participants, 104 agreed to participate in the study.<sup>19</sup> Participation rate was 15.1%, as 96 participants were recruited to a baseline health examination (Figure 1).

After the baseline visit, men and women were randomized separately using SPSS random number generator. The randomization ratio was 1:1 for the CG and the IG.<sup>19</sup>

### Measures

Health examinations included collection of anthropometric and clinical measurements as well as blood samples including an oral glucose tolerance test, insulin, hemoglobin A1c, and low-density and high-density lipoprotein cholesterol levels. Dietary and PA data and lifestyle information were collected using validated questionnaires at the start, middle, and end of the study,<sup>21,22</sup> as described previously.<sup>19</sup>

The objectively measured PA data were collected using Actigraph GT3X+ accelerometers. The accelerometers were lightweight units (27 g) with dimensions of 9.6 × 9.4 × 1.8 cm and were water resistant. They were placed on the participants' non-dominant wrist by the study nurse using a plastic wristband. In addition to the verbal instructions by an Arabic-speaking nurse, participants were also provided with written instructions.

Download English Version:

<https://daneshyari.com/en/article/8816432>

Download Persian Version:

<https://daneshyari.com/article/8816432>

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