Research paper

Correlates of sedentary behavior in 2,375 people with depression from 6 low- and middle-income countries

Davy Vancampfort[a,b,*], Brendon Stubbs[c,d,e], James Mugisha[f,g], Joseph Firth[h,i], Felipe B. Schuch[j,k,l], Ai Koyanagi[m,n]

[a] KU Leuven Department of Rehabilitation Sciences, Tervuursevest 101, 3001 Leuven, Belgium
[b] KU Leuven, University Psychiatric Center KU Leuven, Leuvensesteenweg 517, 3070 Kortenberg, Belgium
[c] Physiotherapy Department, South London and Maudsley NHS Foundation Trust, Denmark Hill, London SE5 8AZ, United Kingdom
[d] Health Service and Population Research Department, Institute of Psychiatry, Psychology and Neuroscience, King's College London, De Crespigny Park, London, Box SE5 8AF, United Kingdom
[e] Faculty of Health, Social Care and Education, Anglia Ruskin University, Chelmsford, United Kingdom
[f] Butabika National Referral Mental Hospital, Kampala, Uganda
[g] Kyambogo University, Kampala, Uganda
[h] NICM, School of Science and Health, University of Western Sydney, Australia
[i] Division of Psychology and Mental Health, Faculty of Biology, Medicine and Health, University of Manchester, United Kingdom
[j] Universidade La Salle (Unilasalle), Canoas, Brazil
[k] Escola de Educação Física, Fisioterapia e Dança, Porto Alegre, Brazil
[l] Department of Psychiatry, Universidade Federal do Rio Grande do Sul / Hospital de Clínicas de Porto Alegre, Porto Alegre, Brazil
[m] Instituto de Salud Carlos III, Centro de Investigación Biomédica en Red de Salud Mental, CIBERSAM, Monforte de Lemos 3-5 Pabellón 11, Madrid 28029, Spain
[n] Research and Development Unit, Parc Sanitari Sant Joan de Déu, Universitat de Barcelona, Fundació Sant Joan de Déu, Dr. Antoni Pujadas, 42, Sant Boi de Llobregat, Barcelona 0883, Spain

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ABSTRACT

Objective: Sedentary behaviour (SB) is harmful for health and well-being and may be associated with depression. However, little is known about the correlates of SB in people with depression. Thus, we investigated SB correlates among community-dwelling adults with depression in six low- and middle-income countries.

Methods: Cross-sectional data from the World Health Organization's Study on Global Ageing and Adult Health were analyzed. The analysis was restricted to those with DSM-IV Depression or receiving depression treatment in the last 12 months. Self-reported time spent sedentary per day was the outcome. High SB was defined as ≥ 8 hours of SB per day. The correlates (sociodemographic and health-related) of SB were estimated by multivariable linear and logistic regression analyses.

Results: In 2375 individuals with depression (mean age = 48.0 years; 60.7% female), the prevalence of high SB was 11.1% (95%CI = 8.2%-14.9%), while the mean (± SD) time spent sedentary was 215 (± 192) minutes per day. Socio-demographic factors significantly associated with high SB were older age and being unmarried, being male and being unemployed. In other domains, no alcohol consumption, current smoking, mild cognitive impairment, bodily pain, arthritis, stroke, disability, and lower levels of social cohesion, COPD, visual impairment, and poor self-rated health was associated with greater time spent sedentary.

Conclusion: Our data suggest that future interventions seeking to reduce SB among individuals with depression may target at risk groups based on identified sociodemographic correlates while the promotion of social cohesion may have the potential to increase the efficacy of future public health initiatives. From a clinical perspective, bodily pain and somatic co-morbidities need to be taken into account.

1. Introduction

Depression is globally the leading cause of years lived with disability (Whiteford et al., 2015). Although depression is also associated with elevated premature mortality partly due to suicide (Hawton et al., 2013), cardio-metabolic and respiratory diseases are the most important causes of premature death (Correll et al., 2017; Cuijpers and Smit, 2002). People with depression are at twice the risk of having

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cardio-metabolic diseases versus the general population (Stubbs et al., 2017c; Vancampfort et al., 2016; Vancampfort et al., 2015a). Moreover, those with depression often have poorer physical health including elevated risk of multimorbidity and pain (Stubbs et al., 2017d).

There is increasing evidence demonstrating that sedentary behavior (SB) is associated with a wide range of deleterious outcomes in adults such as diabetes, stroke, associated premature mortality (Biswas et al., 2015), independently of physical activity levels. SB refers to any waking behavior characterized by an energy expenditure ≤1.5 metabolic equivalents (METs), while in a sitting, reclining or lying posture (Tremblay et al., 2017). SB is highly prevalent across the world (Ekelund et al., 2016b; Loyen et al., 2016). In addition to the deleterious physical health consequences of SB (Wirth et al., 2017) including an increased risk of multimorbidity (Loprinzi, 2015), there is also an increasing evidence base suggesting its association with depression. A recent meta-analysis, almost exclusively among high-income countries, found that among more than 110,000 individuals, higher levels of SB were associated with a higher risk for developing depression (relative risk 1.31 (95%CI 1.16 to 1.48)) (Zhai et al., 2015). Vice versa, people who are diagnosed with depression spent 25.6 (95%CI8.5-42.7) more daily minutes in SB than non-depressed participants. This discrepancy is most notable in adults aged ≥65 years (35.6 minutes in those with depression) (Stubbs et al., 2018). Overall, adjusting for socio-demographics and country, depression is associated with a 1.94 (95%CI1.31-2.85) times higher odds for high SB (i.e., ≥8h/day) (Stubbs et al., 2018).

Despite the increased emphasis in the literature on the important physical and mental health benefits of reducing time spent sedentary and the higher risk for SB in people with depression (Schuch et al., 2017), there is a paucity of studies investigating correlates of SB in people with depression.

Identifying correlates of SB in people with depression can aid in the development of successful SB reduction interventions in this population by highlighting the potentially modifiable correlates that may bring about reductions in SB (e.g. physical environment), or identify characteristics of specific subgroups most in need of intervention (e.g. demographics). Evidence from the general population in high income countries has provided some support for sociodemographic and health correlates of SB, including older age, lower education, being unemployed, female gender, a higher body mass index (BMI), a lower income, smoking, and the presence of depressive symptoms (O'Donoghue et al., 2016; Rhodes et al., 2012). However, special attention should be given to people with depression in whom the antecedents and consequences of SB may differ due to their illness (O'Donoghue et al., 2016; Prince et al., 2017). To the best of our knowledge, such evidence is currently lacking.

Furthermore, exploring SB correlates in people with depression in low- and middle-income countries (LMICs) is particularly important given the increasing rates of non-communicable diseases and sedentary lifestyles (Christensen et al., 2009) and the high prevalence of depression (Guerra et al., 2016) in this setting. Also, compared to high-income countries, there may be lower levels of knowledge regarding the risks associated with SB (Pengpid et al., 2015) and different socio-cultural structures (e.g. active outdoor leisure time mostly only accepted for men) and environmental factors (e.g., higher crime rates, bad climate conditions) (Atkinson et al., 2016) which may impact SB. The continuing dearth of studies from LMICs also highlights the gap between where research is conducted and where the largest public health impacts of SB will occur in the future (Sallis et al., 2016). Understanding sociodemographic factors (e.g. age, sex, employment status, marital status, social cohesion), mental/physical health conditions (e.g. physical comorbidities) and health behaviors (e.g. smoking, alcohol use) that are related with higher levels of SB among individuals with depression may prove useful for developing effective interventions for vulnerable populations in LMICs. The current study used a large, multi-national sample and sought to investigate SB correlates among community-dwelling adults with depression in six LMICs.

2. Methods

2.1. The survey

The current analyses utilizes data from the Study on Global Ageing and Adult Health (SAGE) survey (Wave 1). All interested researchers may seek access to this dataset through the World Health Organization (WHO) website (http://www.who.int/healthinfo/sage/en/). Interviews and performance tests were undertaken between 2007 and 2010 in China, Ghana, India, Mexico, Russia, and South Africa, which were all LMICs at the time of the survey according to the World Bank classification (Bank, 2003). Details of the survey methodology are provided elsewhere (Kowal et al., 2012). In brief, following a standard research protocol across countries, trained interviewers conducted face-to-face interviews using a standard questionnaire to collect information with either the use of a computer-assisted personal interview (CAPI) or a paper and pencil interview (PAPI) depending on the setting. Standard translation procedures for the questionnaires were undertaken to ensure comparability between countries. Sampling weights were calculated to adjust for the population structure as reported by the United Nations Statistical Division. Ethical approval was obtained from the WHO Ethical Review Committee and local ethics research review boards. Written informed consent was obtained from all participants. The survey response rate ranged from 51% (Mexico) to 93% (China).

2.2. Depression

Questions based on the World Mental Health Survey version of the Composite International Diagnostic Interview (Kessler and Ustun, 2004) were used for the endorsement of past 12-month Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV depression (American Psychiatric Association, 2000) (Details provided in eTable 1). Individuals who reported to have received a lifetime diagnosis of depression and treatment for it in the past 12 months were also considered to have depression.

2.3. Sedentary behavior

In order to assess SB, participants were asked to state how much time they spent usually (expressed in minutes per day) sitting or reclining in total including at work, at home, getting to and from places, or with friends (sitting at a desk, sitting with friends, travelling in car, bus, train, reading, playing cards or watching television). This did not include time spent sleeping. This single item is derived from the Global Physical Activity Questionnaire (GPAQ) (Armstrong and Bull, 2006). SB is reported as a continuous variable (minutes per day) and also as a categorical [< 8 or ≥8 hours per day (highly sedentary)] variable. The 8 hours cut-off was chose as previous research indicated that being sedentary for 8 or more hours is associated with a higher risk for premature mortality (Ekelund et al., 2016a). The GPAQ is a suitable and acceptable instrument for monitoring SB in population health surveillance systems (Bull et al., 2009).

2.4. Sociodemographic variables

These included age, sex, highest level of education achieved (completed secondary or less), wealth, marital status [married/cohabiting or else (never married, separated, divorced, or widowed)], setting (urban or rural), and employment status (engaged in paid work ≥2 days in last 7 days: Y/N). Wealth quintiles were created based on country-specific income.