



Research report

Physical (in)activity and depression in older people



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ARTICLE INFO

Article history:

Received 2 November 2013

Received in revised form

28 February 2014

Accepted 1 March 2014

Available online 13 March 2014

Key words:

Depression

Physical activity

Aged

Elderly

ABSTRACT

Background: Knowledge about characteristics explaining low level of physical activity in late-life depression is needed to develop specific interventions aimed at improving physical health in depressed people above the age of 60.

Methods: This cross-sectional study used data from the Netherlands Study of Depression in Older Persons (NESDO), a longitudinal multi-site naturalistic cohort study. People aged 60 and over with current depression and a non-depressed comparison group were included, and total amount of PA per week was assessed with the short version of the International Physical Activity Questionnaire (IPAQ). Depression characteristics, socio-demographics, cognitive function, somatic condition, psycho-social, environment and other lifestyle factors were added in a multiple regression analysis.

Results: Depressed persons > 60 y were less physically active in comparison with non-depressed subjects. The difference was determined by somatic condition (especially, functional limitations) and by psychosocial characteristics (especially sense of mastery). Within the depressed subgroup only, a lower degree of physical activity was associated with more functional limitations, being an inpatient, and the use of more medication, but not with the severity of the depression.

Limitation: This study is based on cross-sectional data, so no conclusions can be drawn regarding causality.

Conclusions: This study confirms that depression in people over 60 is associated with lower physical activity. Patient characteristics seem more important than the depression diagnosis itself or the severity of depression. Interventions aimed at improving physical activity in depressed persons aged 60 and over should take these characteristics into account.

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1. Introduction

Physical activity has a positive effect on health-related quality of life and is therefore important for healthy aging (Bize et al., 2007). The World Health Organization (WHO) considers physical inactivity to be of the four major risk factors for mortality worldwide (WHO, 2011), and others even argue that physical inactivity is a causative factor for the majority of chronic diseases (Booth et al., 2002; Pruijboom, 2011). Numerous studies have shown that depression is associated with decreased levels of physical activity (van Gool et al., 2003; Benedetti et al., 2008; Lindwall et al., 2011), which may

partly mediate the negative health outcomes in depressed persons (Uher et al., 2011). Moreover, a limited number of well-designed studies showed that physical activity could reduce depressive symptoms in people above the age of 60 (Blake et al., 2009; Sjosten and Kivela, 2006). Physical activity can thus be regarded as a key factor with respect to modifiable behavior for improving physical health and functioning, and for reducing depressive symptoms (Warburton et al., 2006).

Little is known about the current level of physical activity in depressed people above the age of 60 and its determinants. Many of the studies that have measured the level of activity or its effect on health failed to include depressed persons > 60 y (Koenen et al., 2011; van Stralen et al., 2009). Treatment studies often lack details about the amount of total physical activity before the intervention (Blumenthal et al., 2007), and according to an expert-panel, depression is not a relevant factor in predicting health behavior and/or physical

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activity determinants in the general population (van Stralen et al., 2010). Furthermore, data on physical activity in young adults with depression cannot be extrapolated to later life, as etiology and phenomenology of depression varies by age.

Late-life depression is associated with cognitive impairment, chronic medical illnesses, medication use, and neurodegenerative diseases (Alexopoulos, 2005), characteristics that have a direct impact on physical activity as well as on the phenomenology of the depression. Several studies have pointed to the prolonged course and negative treatment effects in the presence of co-morbid executive dysfunction and co-morbid vascular disease in late-life depression (Naarding and Beekman, 2011; Alexopoulos and Kelly, 2009). These differences are clinically relevant, as a recent study found that ‘negative symptoms’ of depression – such as loss of interest, diminished activity, and indecisiveness – predict poor outcome of antidepressant treatment and require a more multi-disciplinary approach with additional treatment strategies such as behavioral activation and exercise (Uher et al., 2011).

In order to develop interventions to improve physical activity, and thus physical and mental well-being in depressed people aged 60 and over, more knowledge is needed about the current level and the determinants of physical activity in late-life depression (Nguyen et al., 2008). Characteristics that have been demonstrated to be associated with physical activity as well with depression can be clustered into cognitive function (Hoffman et al., 2008), somatic condition (Antonelli Incalzi et al., 2005), other lifestyle factors (Duijvis et al., 2011) and psychosocial and environmental factors (Harvey et al., 2010; Trost et al., 2002). To date, there are no studies available that combine these characteristics.

The first objective is to compare the amount of physical activity between depressed and non-depressed persons above the age of 60 and to examine which characteristics explain the hypothesized lower level of physical activity in late-life depression. The second objective is to examine the correlates of physical (in)activity in the subgroup of depressed persons above the age of 60.

2. Methods

Data was obtained from the baseline assessment of the Netherlands Study of Depression in Older Persons (NESDO). The NESDO is a longitudinal multi-site naturalistic cohort study aimed at examining the course and consequences of depressive disorders in older persons. The study design of the NESDO is described in detail elsewhere (Comijs et al., 2011).

2.1. Participants

From 2007 to 2010, 378 persons diagnosed with depression (in various stages of development and severity) within the previous 6 months, and 132 non-depressed persons from 60 to 93 years of age were recruited from mental health care and primary care settings in five regions in The Netherlands (total $N=510$). Persons with a Mini Mental State Examination score (MMSE) under 18, a primary diagnosis of dementia or insufficient command of the Dutch language were excluded. The comparison group was recruited at the same general practice locations where the patients were recruited. Informed consent was requested from a random sample of persons > 60 y who scored less than four on the Geriatric Depression Scale during a visit to their GP. Inclusion criteria for the non-depressed comparison group were: no lifetime diagnosis of depression or dementia, and good command of the Dutch language. The ethical review boards of all participating study centers approved the study protocol of NESDO. Written informed consent was obtained from all participants at the start of the baseline assessment.

For the current study, depressed and non-depressed participants with complete data on physical activity variables were included. In addition, persons from the depressed group were included if they had a past-month depression diagnosis (see the flowchart, Fig. 1).

2.2. Measurements

2.2.1. Physical activity

The Dutch short version of the International Physical Activity Questionnaire (IPAQ) was used to calculate the total amount of physical activity in the previous week. This written self-report questionnaire was developed as a tool for cross-national monitoring of physical activity in adults based on sports and daily activities (Craig et al., 2003). According to the official IPAQ guidelines (Patterson, 2005), data are summed up within each activity item (i.e., vigorous intensity, moderate intensity, and walking) to estimate the total number of minutes engaged in physical activity per week. Total weekly physical activity was estimated by converting the activity items into multiples of the basal resting energy expenditure (Metabolic Equivalent of Task=MET) (Ainsworth et al., 2000). When persons had one missing value for one of the three activity items (vigorous-intensity, moderate-intensity, and walking activities min/day), stratified mean scores were imputed for that item. This procedure was applied for 12% of our subjects. Imputation was done with use of stratification based on sex and 5-year age strata within the depression or control group. The dependent variable (total MET minutes per week) was not normally distributed and could not be normalized by log transformation due to seven extreme outliers. These outliers were therefore trimmed at the group mean plus three standard deviations, which resulted in an acceptable distribution. To improve the interpretation of the strength of the associations with physical activity, the total MET minutes per week will be included as Z-scores in the multivariate analyses (see Tables 2 and 3). The psychometric properties of the IPAQ are acceptable for adults (Craig et al., 2003). For persons > 60 y, the criterion validity is adequate in the general population using the MET-minutes as a continuous variable (Tomioka et al., 2011).

2.2.2. Depression

The data on depression characteristics, age of first depressive episode and classification of clinically relevant depressive syndromes (major/minor depression and dysthymia) were obtained from the Composite Interview Diagnostic Instrument (CIDI) version 2.1, developed by the WHO in 1997 (Andrews and Peters, 1998). The depression variable was dichotomized in the analysis (yes/no). Subjects were included in the depressed group if they had a past-month diagnosis of depression (see section ‘participants’). Severity of depressive symptoms was measured with the Inventory of Depressive Symptoms (IDS) (Rush et al., 1996). To examine different symptom dimensions of late-life depression, mood, motivation, and somatic subscales were used. These three homogenous symptom subscales of the IDS have a good fit with exploratory and confirmatory factor analyses in the NESDO study (Hegeman et al., 2012).

2.2.3. Other characteristics

Variables that have been demonstrated to be associated with both physical activity and depression will be examined as confounders (or explanatory factors) in the comparison between depressed and non-depressed people (objective 1) and as correlates of physical activity in depression within the depressed subgroup (objective 2). The characteristics will be clustered into cognitive function, somatic condition, psychosocial factors, and

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