



The joint association of depression and cognitive function with severe disability among community-dwelling older adults in Finland, Poland and Spain



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ABSTRACT

Objectives: To explore the joint association of depression and cognitive function with severe disability in nationally-representative samples of community-dwelling adults aged 50 years and older from Finland, Poland and Spain.

Design: Cross-sectional.

Setting: Community-based.

Participants: Population-based sample of 7987 non-institutionalized adults aged 50 and older.

Measurements: The outcome was severe disability, defined as ≥ 90 th percentile of the 12-item version of the World Health Organization Disability Assessment Schedule (WHODAS 2.0). Past 12-month DSM-IV major depressive disorder was assessed with the depression module of the WHO Composite International Diagnostic Interview (CIDI). A global cognitive function score was obtained through neuropsychological tests. Product terms between depression and cognition were introduced in multivariable logistic regression models to test for interaction.

Results: Lower cognitive function and depression were both significantly associated with severe disability in all countries. A significant interaction was only found in Finland where the ORs (95% CIs) of depression for severe disability at the 25th (worse), 50th, and 75th (better) percentiles of cognitive function were 7.26 (4.28–12.32), 11.1 (6.7–18.38), and 17.56 (9.29–33.2), respectively.

Conclusion: People with depression and cognitive decline are likely to benefit from the usual evidence-based treatments to reduce the burden of disability. However, in Finland, those with better cognitive function may benefit from more aggressive depression treatment. Future research is warranted to assess whether our results may be replicated.

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1. Introduction

Disability in older adults is related to poor quality of life, increased needs for social services and high health care costs (Fried et al., 2001; Verbrugge and Patrick, 1995). Thus, there is a pressing need to understand the process of disability and to develop strategies to effectively

reduce the burden of disability in this population. Depression and cognitive impairment are among the leading causes of disability among the elderly (Murray and Lopez, 1997). Depressive disorder and cognitive impairment in the elderly are highly prevalent (Baldwin, 2008; Chiu et al., 2009; Park et al., 2003). At least 10% of people older than 65 years, and 50% of those older than 85 years, have some form of cognitive impairment, ranging from mild deficits to severe dementia (Jorm and Jolley, 1998). As for late-life depression, prevalence rates range from 6 to 20% in community-dwelling older adults (Baldwin, 2008; Chiu et al., 2009). Cross-sectional studies have reported a significant association

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between levels of disability and depression or cognitive function (Di Carlo et al., 2000; Verhaak et al., 2014). Similarly, longitudinal studies have found that both depression and cognitive impairment are independent risk factors of incident functional decline (Cronin-Stubbbs et al., 2000; Dalle Carbonare et al., 2009; Moritz et al., 1995; St John et al., 2015).

The majority of these studies, however, have not taken into account the fact that depression and cognitive impairment frequently co-exist and that they might interact and jointly affect disability (Han et al., 2006; Mehta et al., 2002). The few studies which have focused on the joint effect of depression and cognitive impairment on disability in elderly populations have reported mixed results. Some studies found that both conditions are only independent risk factors (Mehta et al., 2002) whilst others reported some evidence of interaction, where the risk for disability was higher in depressed people with lower levels of cognitive function (Li and Conwell, 2009; Raji et al., 2002). An interaction between depression and cognitive impairment might indicate that the co-occurrence of these conditions represents a qualitatively different entity requiring a different clinical and treatment approach.

The prevalence of disability (Koyanagi et al., 2015), depression (Simon et al., 2002), and cognitive impairment (Arnáiz et al., 2004) may widely differ between countries. Many factors could contribute to national differences: cultural factors (e.g., openness about depressive symptomatology which may be affected by level of stigma towards mental disorders and social desirability), macro-economic indicators and characteristics of the health care systems (e.g., quality of care, health expenditure, availability of health professionals and treatments, etc.). Thus, it is important for studies to include culturally diverse nationally-representative community samples of older adults to assure unbiased generalization of the results and to determine whether the effect of depression and cognitive decline on disability differs across countries.

The Collaborative Research on Ageing in Europe (COURAGE) is a large, population-based, nationally-representative health study that used standard design and survey procedures in three culturally and economically distinct European countries (Finland, Poland and Spain), providing the unique opportunity to compare the health status of individuals in diverse European settings. The purpose of the present study was thus to gain further understanding of the joint association of major depressive disorder and cognitive decline with severe disability in a representative sample of community-dwelling adults aged 50 and over, and to compare these results in three different cohorts. Understanding the nature of the joint association between depression and cognitive function with severe disability among the general population of older adults would have potential implications for the diagnosis and treatment of these conditions, and may contribute to mitigate the associated burden of disability. Analyzing the results by country might also help to detect country-specific differences and to adapt clinical and public health interventions to specific contexts.

2. Method

2.1. Sample

The present study used data from COURAGE (Leonardi et al., 2014), a cross-sectional household survey of non-institutionalized adult populations in Finland, Poland and Spain. These countries were selected to provide a broad representation across different European regions according to health and welfare characteristics (Eikemo et al., 2008). The surveys took place between 2011 and 2012. In Poland and Spain, a stratified multistage clustered design was used using strata according to geographical administrative and catchment area sizes. Municipalities and census units were systematically selected with probabilities proportional to the population size. Age strata were used to select households, and individuals were randomly selected from inhabitants in a certain age group within the household. In Finland, a two-stage clustered sampling design was used and strata were created based on the largest towns and

university hospital regions. Systematic sampling was conducted so that the sample size in each stratum was proportional to the base population. The individual response rates were 53.4%, 66.5%, and 69.9% in Finland, Poland and Spain, respectively.

The survey protocol was originally designed in English and translated into Finnish, Polish and Spanish according to World Health Organization (WHO) translation guidelines for assessment instruments (WHO, 2014). Interviews were conducted face-to-face by lay interviewers using Computer-Assisted Personal Interviewing (CAPI) at respondents' homes. Interviewers were trained with the instruments prior to the administration of the survey. Quality control procedures were implemented during fieldwork (Üstün et al., 2005).

At the beginning of the interview, the interviewer judged subjectively whether the selected person had important cognitive limitations that would prohibit correct understanding of the survey questions. In such cases, a proxy respondent was administered a short version of the survey.

The original sample consisted of 10800 individuals aged 18 and older. The present analysis focused on individuals aged 50 years and older as the prevalence of disability and depression are not negligible in older adults in general, including middle-aged individuals (Bischkopf et al., 2002; Koyanagi et al., 2015; Mojtabai and Olfson, 2004). Furthermore, focusing on this age group may allow us to detect possible risk factors for severe disability at early stages, and thereby provide crucial information for the implementation of preventive strategies for future negative health outcomes such as dementia or physical dysfunction. Data from proxy respondents was not included since it lacked information on cognitive function and depression, among other relevant variables. After excluding those who were younger than 50 years and those who participated via a proxy respondent, the final sample size was 7987 (Finland 1452; Poland 2910; Spain 3625).

Ethical approval from the corresponding ethics committees (Parc Sanitari Sant Joan de Déu, Barcelona, Spain; Hospital la Princesa, Madrid, Spain; Hospital District of Helsinki and Uusimaa, Finland; and Jagiellonian University Medical College, Krakow, Poland) and informed consent from each participant were obtained.

2.2. Measures

2.2.1. Outcome measure (disability)

Disability was assessed with the 12-item, interviewer-administered version of the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0; Rehm et al., 1999) which evaluates self-reported measures of individual level of functioning in six life domains: cognition, mobility, self-care, getting along, life activities, and participation, by asking participants about the level of difficulty they had in doing these activities during the previous 30 days using a five-point scale (none = 1, mild = 2, moderate = 3, severe = 4, and extreme/cannot do = 5). The total scoring was determined using an Item Response Theory (IRT) analysis, and ranged from 0 to 100 (higher scores indicate greater disability). The WHODAS 2.0 scores were not normally distributed and presented a markedly right-skewed distribution (i.e., excess of scores near zero). Disability was therefore dichotomized using the 90th percentile as the cut-off for each country. This method captured the most disabled 10% of the population (Scott et al., 2009).

2.2.2. Determinants (depression and cognitive function)

The presence of a major depressive disorder in the previous 12 months was assessed according to the Diagnostic Statistical Manual of Mental Disorders (DSM-IV-TR) criteria (American Psychiatric Association, 2001) using an adapted version of the depression module of the WHO Composite International Diagnostic Interview (CIDI; Kessler and Üstün, 2004). Cognitive function was assessed through five performance tests measuring three domains: learning and short-term memory [three trials of immediate recall after being presented with a list of 10 words, and delayed recall of these same 10 words using the CERAD (Consortium

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