

Research Paper

Psychological and physical functioning difficulties associated with complex activity limitations among U.S. adults

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Abstract

Background: There is limited research that assesses psychological functioning categorically as a predictor of complex activity limitations either alone or in conjunction with physical functioning.

Objectives: This paper assesses the impact of psychological and/or physical functioning difficulties as predictors of complex activity limitations among U.S. adults, using data from a national survey.

Methods: Data come from the 2006–2010 National Health Interview Survey among U.S. adults 18 or older ($n = 124,337$). We developed a combined physical/psychological exposure variable with six categories: 1) no/low psychological distress (LPD) and absence of physical functioning difficulties, 2) moderate psychological distress (MPD) only, 3) serious psychological distress (SPD) only, 4) physical functioning difficulty only, 5) MPD and physical functioning difficulties, and 6) SPD and physical functioning difficulties. Selected complex activity limitations include daily living, social and work limitations.

Results: Compared to adults with LPD and absence of physical functioning difficulties, the results demonstrated a clear and significant gradient of increasing risk of complex activity limitations beginning with MPD only, SPD only, physical functioning difficulty only, both MPD and physical functioning difficulties, and SPD and physical functioning difficulties.

Conclusions: The data suggest a stronger risk of complex activity limitations when increasing psychological functioning difficulties coexist with physical functioning difficulties, leading to potential interference with a person's ability to accomplish major life activities measured in this study. The sizeable contribution of psychological distress to the prevalence of basic actions difficulty implies that the mental health component of functional limitations is important in the overall assessment of health and well-being. Published by Elsevier Inc.

Keywords: Psychological functioning; Physical functioning; Basic actions difficulty; Complex activity limitations; K-6

Disability is currently understood,^{1–5} as a complex phenomenon that embraces a bio-psycho-social paradigm and adopts a multidimensional, functional approach. The complexity of disability precludes operationalization by a single survey measure with dichotomous response options. In order to best capture its inherent complexity, disability is best represented by examining its component parts.

Disability can be understood on multiple levels, from manifestation within a person, i.e. individual capacities (basic actions difficulties) to performance in their environment (complex activity limitations). This paper focuses on

two core constructs of the disability phenomenon: basic actions and complex activities; and two components within basic actions – physical and psychological functioning. Basic actions refer to specific acts of physical and mental functioning and include sensory, movement, psychological, intellectual and cognitive functioning. Complex activities represent a more complicated level of functioning and incorporate organized and multiple tasks. Traditionally, difficulties experienced performing basic actions and/or limitations in carrying out complex activities place a person in the category *disabled*.^{6,7} However, we operate under the premise that the process starts with the person's own capacities (basic actions difficulties) and then moves to performance in activities (complex activity limitations). It is clear that there is some overlap between these two constructs and moderate co-linearity would be expected. Therefore we treat basic actions difficulties as a predictor variable and complex activity limitations as an outcome variable. Within basic actions, we will address the interaction of these two components: physical and psychological

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functioning difficulties. In the analyses presented here, physical functioning includes indicators of sensory (seeing and hearing), movement (mobility) and cognition (remembering) difficulty that meet current criteria^{2,6,8} and have been used extensively. Psychological functioning is operationalized using Kessler's K-6 scale⁹ of psychological distress.

Research has demonstrated the associations between certain physical functioning difficulties and complex activity limitations¹⁰; and associations between dichotomous measures of mood disorders and complex activity limitations.^{11–13} General population-based surveys^{14–16} and surveys of the adult population specifically^{17,18} have assessed the co-morbidity of mood disorders and physical functioning. In an earlier paper¹⁹ we examined the joint association between mood disorders (Major Depressive Episode, Dysthymia and Bipolar I-II disorders), physical functioning and complex activity limitations using data from Third National Health and Nutrition Examination Survey (NHANES III 1991–1994). Due to sample restrictions in those data, the paper focused on a population of young adults (17–39 years of age). There is, however, also an association between psychological and physical functioning in older age groups.¹⁸ In order to adequately investigate physical functioning and/or psychological functioning as predictors of complex activity limitations, it is important to address the issue of their comorbidity.

Lacking among established research is a determination of the magnitude of the association of complex activity limitations with basic actions difficulties, particularly those with psychological functioning difficulties or with comorbid psychological and physical functioning difficulties. These associations may have important ramifications because of the potential impact of these difficulties among an aging population that is increasingly prone to chronic conditions and limitations in functional ability. This paper analyzes the impact of selected basic actions difficulties on the risk of complex activity limitations among U.S. adults, using data over several years from a national survey.

Methods

Data source and study population

Data from the 2006–2010 National Health Interview Survey (NHIS) were used for analysis.^{20–24} Due to a change in the hearing question in the 2007 NHIS (the addition of a response category), data reported from 2006 are not strictly comparable with data from more recent years. This will not be immediately apparent in the combined results presented here. The impact on the results is minimal; and pertains more specifically to analyses of trend over time. For more information see: Health, United States, 2010 [Ref. 25, Appendix 2, page 499]. The NHIS is a cross-sectional household survey of the civilian, non-institutionalized population of the United States, conducted annually by the National Center for Health

Statistics (NCHS). Data are collected in person from a sample based on a multistage probability design. The basic module of the NHIS is a core questionnaire that consists of three main components: the Family Core, the Sample Adult Core, and the Sample Child Core. The Family Core collects information for all family members based on responses from a family respondent. The Sample Adult Core collects information from one randomly selected adult aged 18 or over in each surveyed family. Data for this analysis are from the Family Core, the Sample Adult Core, and, for poverty data, the Imputed Incomes files. For the study period (2006 through 2010) 124,337 sample adults participated in the NHIS – and while all analyses are subject to non-response on certain variables, the non-response for the elements in the analyses presented here was minimal (less than or equal to 1.0%). The average final response rate for sample adults over the five study years was 65.2%. Interviews are completed in-person. Specific weights have been established for use of multiple waves. More information on the sample design and survey characteristics of the NHIS is available at: http://www.cdc.gov/nchs/nhis/quest_data_related_1997_forward.htm.

Basic actions difficulties: exposure groups

Kessler's K-6 trichotomized is used as an indicator of psychological functioning^{9,26}; and as indicators of physical functioning, difficulties with mobility, vision, hearing and cognition were operationalized. Details and definitions of these indicators are available in [Ancillary Online-only Material](#).

By cross-classifying the indicators of psychological functioning (trichotomy) and physical functioning (dichotomy), we created one combined exposure variable with six categories defining persons with selected basic actions difficulties: 1) no/low psychological distress (LPD) and absence of physical functioning difficulties (referent group), 2) moderate psychological distress (MPD) only, 3) serious psychological distress (SPD) only, 4) physical functioning difficulty only, 5) both MPD and physical functioning difficulties, and 6) SPD and physical functioning difficulties.^{19,27} Additional details are available in [Ancillary Online-only Material](#).

Complex activity limitations: outcome measures

Complex activity limitations are defined through the presence of daily living, social and/or work limitations. Daily living limitations include activities of daily living (ADL)²⁸ and instrumental activities of daily living (IADL).²⁹

The presence of social limitation is determined on the basis of three NHIS questions that cover difficulties going out, difficulties participating in social, at home or leisure activities.

Inability to work (work limitation) is operationalized in NHIS as either a respondent-defined limitation in the kind or amount of work or as a complete inability to work.

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