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Original Study

Depression and Health Service Utilization From Age 70 to 85: The Jerusalem Longitudinal Study

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A B S T R A C T

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Background: Health service utilization rises with age, and yet, its determinants are poorly understood. Our objective was to examine the association between depression and health service utilization from age 70–85.

Methods: A representative sample (born 1920–1921) from the Jerusalem Longitudinal Cohort Study (1990–2010) was assessed at age 70, 78, and 85 for depression (using the Brief Symptoms Inventory); emergency room (ER) visits, and hospitalization in the previous year; social, functional, and medical domains.

Results: We examined 414, 674, and 1118 subjects at ages 70, 78, and 85, among whom prevalence of depression was 16.2%, 21.1%, and 36.7%, respectively. ER visits and hospitalization were higher among depressed subjects. We adjusted for sex as well as financial status (social model); physical activity, going outdoors, functional status (functional model); and diabetes, ischemic heart disease, hypertension, cancer, dementia, chronic pain, and smoking (medical model). Depressed subjects were more likely to report increased ER visits, after adjustment in social, functional or medical models at age 78 (odds ratio [OR], 2.1, 95% confidence interval [CI], 1.3–3.3; OR, 1.8, 95% CI, 1.1–2.9; OR, 2.0, 95% CI, 1.26–3.26), and at age 85 (OR, 1.7, 95% CI, 1.33–2.3; OR, 1.4, 95% CI, 1.04–1.81; and OR, 1.4, 95% CI, 1.1–1.94), respectively. Aside from the social model at age 85 (OR, 1.5, 95% CI, 1.1–2.0), depression was not associated with increased likelihood of hospitalization.

Conclusions: Depression at ages 78 and 85 is consistently associated with increased ER visits and should be considered among older people presenting to the ER.

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Among the elderly population, depression is a common and disabling problem, with estimates of clinically relevant depressive symptoms ranging from 7% to 49% among elderly Caucasians.¹ The high prevalence, incidence, and substantial consequences make

depression a prominent factor in the burden of illness, which is so frequently present among populations of older people. Depression has been found to be associated with numerous negative health outcomes of particular importance among older people, which include for example, increased rates of disability,² falls and chronic pain,³ alongside delayed recovery after hip fracture,⁴ and stroke.⁵

The combination of high comorbidity and functional decline, in conjunction with the complicated social and psychological impact of life in the long term setting, are no doubt responsible for the high prevalence of depression repeatedly observed among people living in long term care settings.⁶ One large study of a long term care facility found that 12.4% of residents experienced major depression, and 35.0% experienced minor depression.⁷ Another study identified depression among 20% of people on admission to the long term setting, with an annual incidence of major depression being 6.4% after the first year. Depression was recognized by nursing and social work staff in less than 50% of cases.⁸

The question as to whether or not depression among older people translates into increased health service utilization is yet to be fully

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resolved. In contrast to depression among younger and middle aged adults, literature among older people and particularly among the oldest old (aged 85 years or more) is sparse. Depressive symptoms have been reported to be associated with increased overall healthcare and preventative services utilization among elderly Europeans.⁹ However, conflicting results were described concerning the relationship between depression and acute hospitalization among community dwelling elderly people.^{10,11} Among studies that have investigated emergency room (ER) visits among older people, none have specifically examined the direct relationship between depression and ER utilization.^{12–14}

Differences in the study design, widely heterogeneous age groups of older people, and various length of follow-up may well contribute to methodological reasons for lack of conformity of findings to date concerning health service use and depression among the elderly. Furthermore, despite the observation that the oldest old have a higher prevalence of depression, they also have a distinctive and qualitative shift in profile of health, comorbidity, and functional status in comparison with the younger elderly.^{15,16} Against the shifting trajectories, which spell the gradual loss of overall health, well-being, and function, the significance and implications of depression on health service utilization may vary among different age groups within the elderly population.

The Jerusalem Longitudinal Study has examined depression among an aging community dwelling representative cohort from age 70 to 85 and has addressed the following questions. (1) Is depression among older people associated with an increased rate of acute hospitalization and ER visits? (2) Is the relationship between depression and health service usage among older people age dependent, being perhaps influenced and changing from “young elderly” at age 70 through to “oldest old” at age 85?

Methods

Study Sample

The Jerusalem Longitudinal Cohort Study continues to prospectively follow a birth cohort of Jerusalem residents (born June 1920–May 1921) from age 70 at baseline in 1990, up to age 92 at the present time.^{15,17,18} The sample frame throughout the duration of the research has been the birth cohort born 1920–1921 who were residents in Jerusalem. All subjects were randomly chosen from the national electoral register. Subjects were aged 70–71 at baseline in 1990–1991, and at subsequent study phases in 1997–1998 and 2005–2006, the sample frame was augmented with newly recruited subjects aged 77–78 and 85–86, respectively, again randomly chosen from the updated electoral register. The cohort was highly heterogeneous in origin reflecting the historical and social forces of the last century that have been formative of Israeli society. The study sample has been proven to be representative, as shown by similar morbidity, mortality, and health service utilization when comparing study subjects, those who refused to enroll in the study, and those subjects from the cohort not approached. The primary reason for attrition was mortality; 24.8% died during follow-up (1990–2005), 5.4% of enrollees declined to continue to a subsequent phase, 3% left the Jerusalem area and therefore dropped out, and a further 1.1% were lost to follow-up because of a lack of updated contact information.^{15,17,18}

Proxy informants, with consent from legal guardians, were used in the case of extremely frail or demented subjects. Each participant, or legal guardian, provided informed consent, and the Hadassah Hebrew University Medical Center Institutional Review Board approved the study.

Measures

Subjects underwent 2 separate structured interviews and assessment, each one lasting 1.5 hours and performed by a trained study researcher. One interview included mainly social information gathered by a trained occupational therapist, and a second interview was performed by a trained study physician. Over 700 items were covered in the baseline questionnaire.

The medical interview included physician based assessment of medical diagnoses, medication usage, a structured systems review, and cognitive and anthropomorphic measures. The study physician made diagnoses following medical assessment, system review, and examination. Major diseases were defined by the International Classification of Disease, Ninth Edition.¹⁹

The following variables were examined in the current study: marital status (married vs not married); years of education; self-reported financial status (defined according to the following question “Do you have financial difficulties?” Available answers were (1) never, (2) occasionally, (3) often, and (4) usually. Subjects answering (2), (3), or (4) were deemed to be in poor financial state); leaving the house (daily vs <daily); loneliness (often or occasionally vs never); overall self-rated health (poor or good); smoking status (ever smoked vs never smoked); physical activity (<4 hours/week of physically active vs >4 hours/week); dementia defined as Mini-Mental Score Examination <24²⁰; functional status defined as dependence on another person in 1 or more of 6 basic activities of daily living (dressing, eating, washing, toileting, continence, and mobility).²¹ Musculoskeletal or joint pain lasting more than 3 months was defined as chronic pain.

Main Independent Variable: Depression

Depression was identified using the Brief Symptoms Inventory (BSI).²² Subjects were asked how much they had suffered in the previous month from (1) loneliness; (2) lack of interest; (3) thoughts of ending your life; (4) bad mood; (5) hopelessness concerning the future; and (f) worthlessness. They were asked to score each question from 0 to 4 (0 = none, 4 = greatly). Depression was defined as a total score of $\geq 6/24$ points. Subjects unable to answer the questions (due to severe cognitive impairment) were not included in the study.

Study Outcome: Emergency Room and Hospitalization in the Last Year

The study's primary end points were hospital admission and ER visits within the preceding 12 months at time of interview. In case of several hospital admissions or ER visits, only the first event was considered. Data concerning these end points was available through self-report. We also collected data concerning outpatient physician visits, nurse home visits, and physiotherapist visits in the last month. Use of home help for functional assistance was also determined through self-report.

Statistical Analysis

Descriptive statistics were performed. Categorical variables were compared with χ^2 test. Logistic regression analyses were conducted to detect variables associated with increased likelihood of acute hospitalization and/or ER visits. Different models included social, functional, and medical variables. All models included depression and sex as well as other covariates: (1) a social model included financial status; (2) a functional model included physical activity, frequency of going outdoors and ADL; (3) a medical model included diabetes, IHD, hypertension, history of any cancer, dementia (only for age 70 and 85, since only a single person had dementia and depression in age 78),

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