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Original Studies

Patient-Reported Outcomes in Functioning Following Nursing Home or Inpatient Rehabilitation

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A B S T R A C T

Objectives: Our study examines factors associated with patient-reported outcomes in functioning among Medicare beneficiaries who reported receiving rehabilitation services in a nursing home or inpatient (ie, hospital or rehabilitation facility) setting in the prior year.
Design: Data are from the 2015 and 2016 rounds of the National Health and Aging Trends Study (NHATS), a longitudinal study of a nationally representative sample of Medicare beneficiaries aged 65 years and older.
Setting and Participants: A total of 479 participants in the 2016 sample who reported receiving rehabilitation services in a nursing home or inpatient setting in the past year.
Measures: Bivariate and logistic regression analyses examined the association of demographic, socioeconomic status, and health variables (from the 2015 interview) and rehabilitation characteristics (from the 2016 interview) with patient-reported improvement in "functioning and ability to do activities" while receiving rehabilitation services in the past year.
Results: Among Medicare beneficiaries who received rehabilitation services in nursing home or inpatient settings, 33.4% (weighted percent) reported no improvement in functioning while they were receiving rehabilitation. In a regression analysis that accounted for demographics, those with a high school education or less (compared with those with a college degree), instrumental activities of daily living impairments, certain primary conditions for rehabilitation, less than 1-month total duration of rehabilitation services, and no outpatient rehabilitation services had greater odds of reporting no improvement.
Conclusions/Implications: Our weighted sample represents approximately 2.3 million Medicare beneficiaries who received rehabilitation services in nursing home or inpatient settings. In this sample, 1 in 3 reported no improvement in functioning, with differences in patient-reported outcomes across socioeconomic status, health status, and rehabilitation characteristics domains. Consideration of characteristics across these domains may be clinically pertinent, but investigation as to why these differences are present and whether services can be optimized to further improve patient-reported outcomes is warranted.

Millions of Medicare beneficiaries receive rehabilitation services yearly. These services include physical, occupational, and speech therapy, and are often delivered in skilled nursing facilities (SNFs) or inpatient settings (eg, rehabilitation units in acute care hospitals or stand-alone inpatient rehabilitation facilities).[1–3] Medicare pays 100% of the payment for the first 20 days of qualified SNF care and a

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copayment from days 21 to 100 (but does not pay for stays longer than 100 days).[3] Although older adults have a strong preference for living in the community,[4,5] episodes of acute illnesses[6,7] and impairments in function[8–11] increase their risk for institutionalization for long-term care. Rehabilitation services thereby perform a critical role in helping older adults maintain independence as these services aim to restore, sustain, or limit decline in functioning[12] and often occur in the post-acute care context following a hospitalization.[13] In 2014, 1.7 million fee-for-service Medicare beneficiaries were admitted to SNFs (often for short-term skilled nursing and rehabilitation services for post-acute care) and 339,000 received inpatient rehabilitation facility services, which totaled $28.6 billion and $7 billion in Medicare payments, respectively.[3] Despite recent calls for an increased focus on patient-centered endpoints and treatment goals,[14–17] relatively little is known regarding patient-reported outcomes of older adults who receive rehabilitation services.[1] We, therefore, seek to examine patient-reported outcomes in a national representative sample of Medicare beneficiaries who reported receiving SNF or inpatient rehabilitation services in the year of follow-up.

Patient-reported outcomes are increasingly relied upon to complement medical tests and examination findings to enhance patient care and outcomes.[14] There are numerous advantages of patient-reported outcomes – they can be used to assess the severity of symptoms, track outcomes, prioritize treatment discussions and treatment decisions, monitor general health and well-being, and more fully engage patients in their care.[14] Patient-reported outcomes also facilitate a more holistic assessment of patients.[14] Demographic factors are relevant to patient-reported outcomes as increasing age and male sex are associated with increased medical comorbidities among older adults.[18] In addition, older adults with a low socioeconomic status (SES) have a "double burden of disease"; they are more likely to have more medical comorbidities and, even compared with higher SES older adults with a similar disease burden, they are more likely to have worse patient-reported outcomes.[19] Likewise, medical comorbidity and depression are also associated with worse patient-reported outcomes.[20] With few exceptions, patient-reported outcomes related to rehabilitation have not been evaluated using contemporary data.[1,21]

Our study seeks to build on prior work by examining patient characteristics associated with patient-reported lack of functional improvement among Medicare beneficiaries who received nursing home and inpatient rehabilitation services. We hypothesize that demographic (eg, increased age, male sex), socioeconomic (eg, living alone, less education, Medicaid status), health status (eg, impairments in daily activities, presence of anxiety or depression), and rehabilitation characteristics (eg, shorter duration of rehabilitation treatment) will be associated with patient-reported lack of improvement in functioning during rehabilitation.

Methods

Study Population

The National Health and Aging Trends Study (NHATS) is a longitudinal cohort study that examines a nationally representative sample of Medicare beneficiaries aged 65 years and older with annual interviews beginning in 2011.[22] NHATS is publicly available, is administered in English and Spanish, and oversamples older age groups and Black individuals. Proxy respondents were used when Medicare beneficiaries were unable to respond for themselves. In 2015 NHATS added questions regarding rehabilitation services[22] that were repeated in 2016. For the 2015 and 2016 interviews, NHATS had an unweighted response rate of 76.8% and 90.6%, respectively.[22] The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved NHATS. Of the 7276 NHATS interview participants in 2016, 6380 had information on whether they received any rehabilitation services. Of the 6380 people with information on rehabilitation services, 479 had information on change in functioning and reported receiving nursing home or inpatient rehabilitation services in the past year, which was determined by this question: "In the last year, did you receive rehab as an overnight patient in a hospital, nursing home, or rehab facility."[23] Our study examines these 479 participants, which represents a weighted sample of 2,281,563 older adult Medicare beneficiaries.

Measures

Dependent variable

NHATS participants were asked: "While you were receiving rehab services in the last year, did your functioning and ability to do activities improve, get worse, or stay about the same?"[23] We dichotomized this variable, recording whether participants reported that their functioning and ability to do activities did not improve (ie, "stayed about the same," "got worse," "varied/up and down"; = 1) or improved (=0).[23] This variable was collected in the 2016 interview and dichotomized because of a limited sample size (only 11 and 12 participants reported that their functioning varied or got worse, respectively).

Independent variables

We include variables spanning demographics, socioeconomic status, health status, and rehabilitation characteristics domains—domains that have been associated with patient-reported outcomes.[1,19,20] With the exception of the rehabilitation characteristics that were evaluated in the 2016 interview, independent variables were determined at the 2015 interview. All independent variables were based on self- or proxy-report (n = 404 and n = 75, respectively); proxy interviews occurred when the sampled NHATS Medicare beneficiaries could not respond to the interview questions (eg, because of a physical or cognitive problem).[22] Independent variables were treated as unordered dummy variables with a reference category.

Demographic variables included location of residence, respondent age, a binary indicator for "female" or "male," race, and living arrangement. Reference groups were living in the community, 65-74 years old, female sex, white non-Hispanic race and ethnicity, and living with spouse/partner and maybe others.

SES variables included education and Medicaid status. Reference groups were college degree and not having Medicaid.

Health status variables included self-reported measures of physical and mental health. Heart disease, arthritis, lung disease, stroke, cancer, and dementia were recorded as present if participants reported that a doctor had ever told them they have one of these conditions (at the 2015 or an earlier NHATS interview).[23] Activities of daily living (ADL) impairments[24] were present if participants reported either having difficulty with performing the following activities or that they "can't do/don't do" the following activities without help: eating, transferring out of bed, transferring out of chairs, walking inside, going outside, dressing, bathing, or toileting. ADL was dichotomized into the presence or absence of ADL impairment. Instrumental activities of daily living (IADL) impairments[25] were present if the participants reported that they were unable to perform the following activities: prepare meals, do laundry, do light housework, shop for groceries, manage money, take medicine, or make phone calls. IADL was dichotomized into the presence or absence of IADL impairment. The 2-item Patient Health Questionnaire, a validated depression screening instrument,[26] evaluated depressive symptoms; the 2-item Generalized Anxiety Disorder scale, a validated anxiety screening instrument,[27] evaluated anxiety symptoms. NHATS slightly modified the 2-item Patient Health Questionnaire and 2-item Generalized Anxiety Disorder to examine the prior 1-month period and scored both from 2-8 (rather than the