Tracking Progress toward National Health Objectives in the Elderly: What Do Restricted Activity Days Signify?

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ABSTRACT

Restricted activity days is the measure by which the 1990 health objectives for prevention of functional disability in older adults will be evaluated. Yet its significance in older populations is poorly understood. We evaluated its use as an outcome measure for a randomized trial designed to impact upon physical function in elderly HMO enrollees. As predicted, restricted activity days was more correlated with physical disability measures than with other health status measures. Distributional properties and rates of missing data were shortcomings. (*Am J Public Health* 1991;81:485–488)

Introduction

In 1979, the US Surgeon General's report[1] designated the prevention of functional disability as the principal goal of health promotion in older adults. Restricted activity days (RAD), a standard item on the National Health Interview Survey, was chosen as the primary measure of disability to be monitored with the goal of achieving a 20 percent reduction by 1990. Evaluation of progress toward this goal is hampered because the meaning of RAD as a measure of health status in the elderly remains uncertain.[2,3] In younger age groups, RAD reflect transient loss of ability to perform social roles at work, home, or school, usually because of a physical limitation. In the elderly, many of whom are retired, usual activities are more variable. For this reason, several investigators have called for a better understanding of the appropriateness and usefulness in the elderly of such traditional health status measures as RAD.[4–6]

Because of the Surgeon General's 1990 objectives, we chose RAD as a primary outcome measure for an ongoing randomized controlled trial of health promotion involving nearly 2,300 older adults. We hypothesized that RAD would be more strongly correlated with measures of physical disability than with measures of mental, social, and global self-perceived health. Since there has been some speculation that days spent in bed might be a better measure of health status than RAD,[7] we compared the associations of both variables with these other health status measures.

Methods

The study setting is Group Health Cooperative (GHC) of Puget Sound, an HMO (health maintenance organization) located in western Washington State. At the study's inception in 1987, approximately 11 percent of enrollees were age 65 or older. This report is based on data from 2,289 enrollees, 36 percent of a random sample of 6,328 seniors, who returned completed baseline questionnaires and agreed to participate in the trial.

The questionnaire covered a broad range of health beliefs, behaviors, and conditions and included a number of standard single-item measures and multi-item scales. Information was obtained on the number of RAD and days spent in bed for the preceding 12 months using the questions described in Table 1, Section A.

For comparison with RAD and bed days we selected a number of baseline measures of physical health (Table 1, Section B), several measures of mental and social health (Table 1, Section C), and two self-evaluations of health status (Table 1, Section D). Spearman rank correlation coefficients were used to assess the association between the disability day variables and the other health status measures. Measures within each health status domain (physical, psychosocial, and self-evaluated health) were correlated with each other and within-group correlations were compared with correlations of each measure with disability days.

To explore reasons for non-participation in the trial, we interviewed a random sample of 175 non-participants by telephone using an abbreviated version of the same questionnaire. Nonparticipants were similar to participants with respect to age, gender, the prevalence of chronic disease, and number of RAD. They had less education, lower incomes, higher rates of smoking, worse self-perceived health, and less participation in social activities.*

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TABLE 1—Selected Health Status Indices from Senior Baseline Questionnaire

Health Status Measure	Description and/or Item Content	Source
A. Disability Days		
1. Restricted activity days	Two items: "In the past 12 months, did you cut down the things you usually do, such as going to work or working around the house, because of illness or injury?" IF YES: "How many days did you cut down on the things you usually do because of illness or injury?"	Adapted from NHIS[8]
2. Days spent in bed	Two items: "In the past 12 months, did you ever stay in bed because of an illness or injury?" IF YES: "How many days did you stay in bed at least half the day because of illness or injury?"	Adapted from NHIS[8]
B. Physical Health Measures		
1. Functional limitations	Guttman scale of seven daily living activities: "For how long (if at all) has your health limited you in each of the following activities? (1) The kinds or amounts of vigorous activities you can do . . . [least impaired] . . . (7) Eating, dressing, bathing or using the toilet [most impaired]". Coefficient of reproducibility = .91, coefficient of scalability = .61.	Adapted from Ware[9,10]
2. Illness	Single item: "In the past 12 months, have you had a major personal illness?"	
3. Hospitalization	Single item: "In the past 12 months, were you ever in the hospital overnight for physical health problems?"	
4. Pain	Single item: "We would like to find out about any physical pain you may experience in your daily life. Below is a scale from 0 (no pain) to 10 (very severe pain). Please place an 'X' on the line in the spot that most closely represents how much pain you experience on a daily basis."	Ware[11]
5. Symptoms	13 questions about a range of symptoms experienced in the past week: e.g. "I felt dizzy or lightheaded when I sat up or stood up"; "I had stomach cramps."	Developed for the study
6. Role limitations	Seven item scale on short-term physical limitations: "During the past 4 weeks, have you had any of the following problems with your work or other daily activities as a result of your physical health? a. Were limited in the kind of work or other activities you usually do?; g. Required special assistance (the assistance of others or special devices) to perform the activities you usually do."	Ware[10]
7. Heart Trouble	Single item: "Here is a list of medical conditions which usually last for some time. Have you had any of these conditions in the past 12 months?" Affirmative to "Heart trouble".	Belloc[12]
C. Social/Psychological Measures		
1. Life Satisfaction	11-item scale: "Below each question is a scale from 0–10, where 0 is "very satisfied" and 10 is "very dissatisfied". Please place an 'X' on the line by the number that most closely represents your response to each question."	Patrick[13]
2. Positive Affect/Pep and Vitality	Combined score from 10-item Positive Affect subscale and a number of items from a second subscale (Pep and Vitality): "During the past month . . . (a) how much of the time have you felt that the future looks hopeful and promising? . . . (m) how much energy, pep or vitality did you have or feel?" (6 response categories)	Adapted from Veit[14]
3. CES-D	10-item adaptation of the Center for Epidemiological Studies Depression Scale. "Please indicate by circling the appropriate response how often you have felt this way during the past week: (a) I was bothered by things that usually don't bother me . . . (j) I could not 'get going'."	Adapted from Radloff[15]
4. Stress	Single item: "Pictured below is a scale from 1 (none) to 10 (a great deal). Which number on the scale best represents how much stress you have been under for the past year?	Bailey[16]
5. Social Support	Single item: "Do you belong to a close circle of friends, a group of people who keep in touch with each other?"	Morgan[17]
6. Nervous Condition	Single item: "Here is a list of medical conditions which usually last for some time. Have you had any of these conditions in the past 12 months?" Affirmative to "Chronic nervous or emotional problems".	
D. Self-Evaluations of Health		
1. Self Perceived Health	Single item: "Would you say, in general, your health is (1) excellent . . . (5) poor?"	Ware[10]
2. Current Health Outlook	9-item subscale of General Health Perceptions Index: e.g. "My health is excellent"; "I have been feeling bad lately." (5 response categories)	Ware[10]

Results

Missing Values

In the 2,289 participants with completed baseline questionnaires, 11 percent of responses on RAD and 4 percent on bed days were missing. Missing data were more frequent for both measures among older respondents and those with poorer self-evaluated health (Figure 1.a., 1.b.).

Baseline Distribution of RAD and Bed Days

Both disability day variables had highly skewed distributions, as has been found for many measures of physical health in community-dwelling older populations.[14] Seventy-four percent of respondents reported no RAD and 73 percent reported no days spent in bed in the past 12 months.

Other Health Status Measures

Spearman correlations of RAD and bed disability days with selected measures of physical, psychosocial, and self-evaluated health status are presented in Table 2. Restricted activity days and bed days were highly correlated (.61); when the subset of RAD due to bed days was excluded, the correlation was .53. As hypothesized, the number of RAD was most strongly correlated with indicators of physical health (correlations ranged from .20 to .48), including the other two disability measures, functional and role limitations (r's = .34 and .39, respectively). Within-group correlations among physical health status measures ranged from .11 to .60.

Moderate correlations between RAD and the two self-evaluations of health were also found: .24 for self-reported health and .30 for current health outlook. However, these two measures were more highly correlated with each other (.68). The weakest associations with RAD were for the social support and mental health measures. Restricted activity days was more strongly correlated than bed days with all the physical health measures, except for hospitalization in the past 12 months (Table 2).

Our assessment of correlations between RAD and a subset of these variables in the sample of nonparticipants showed findings similar to the larger sample; RAD continued to be more strongly correlated with the available physical health status measures and had stronger correlations than bed days with most health status measures.

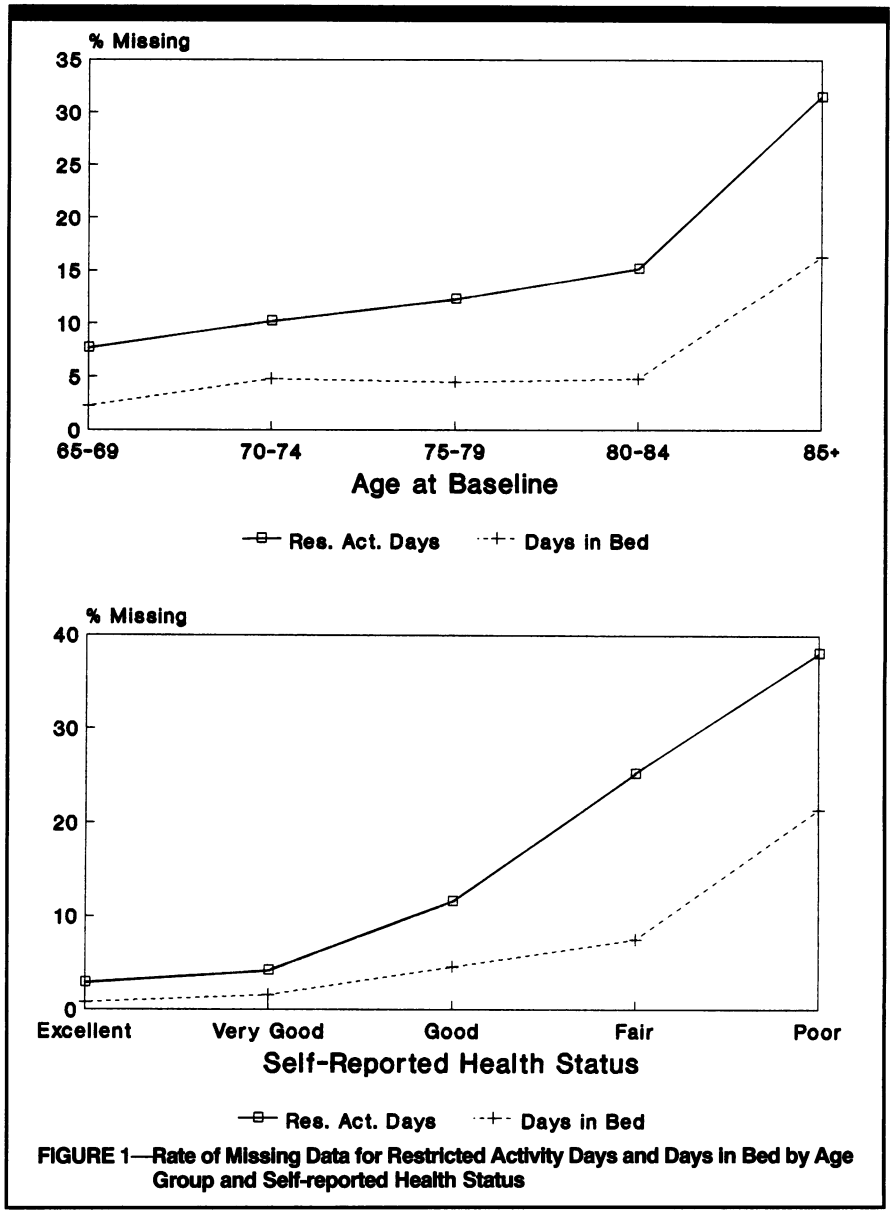

FIGURE 1—Rate of Missing Data for Restricted Activity Days and Days in Bed by Age Group and Self-reported Health Status

Discussion

The vague nature of RAD has been cited as a drawback to its use.[7] Our findings indicate that the potential shortcomings do not preclude its use in studies where physical disability is the health dimension of interest. The validity of using RAD is supported by its being most highly correlated with measures of physical health status and with functional limitation measures in particular.

Our results do not support the suggestion that bed days may be a better indicator of physical disability; its correlations with virtually all other health status measures were weaker than those for RAD.

While these results support our initial hypothesis, several limitations to the use of RAD deserve mention. Both disability days variables had very skewed distributions in this sample of essentially well elderly, limiting their usefulness in describing the full range of physical health status. In addition, over 10 percent of the data on RAD were selectively missing, an indication that this variable, in self-administered form, posed problems for participants.

The proportion of the sample that agreed to participate in this study represents a potential limitation of this analysis. This would be particularly so if non-participants were more disabled than those who agreed to be part of the study. Our study of nonparticipants allowed us to replicate this analysis in part and provided information that they had similar levels of disability and similar correlation patterns.

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TABLE 2—Correlation Matrix[1,2] for Disability Days, Physical and Social/Psychological Health Indices, and Self-Evaluations of Health

	A.		B.							C.						D.	
	1	2	1	2	3	4	5	6	7	1	2	3	4	5	6	1	2
A. Disability Days																	
1. Restricted Activity Days	/																
2. Days spent in bed	.61	/															
B. Physical Health Status Measures																	
1. Functional Limitations Scale	.34	.22	/														
2. Illness in past 12 months	.48	.46	.30	/													
3. Hospitalization in past 12 months	.41	.51	.22	.60	/												
4. Pain scale	.24	.15	.47	.17	.11	/											
5. Symptoms	.22	.13	.35	.17	.11	.34	/										
6. Role limitations	.39	.23	.56	.28	.19	.42	.42	/									
7. Heart disease	.20	.15	.25	.32	.28	.14	.21	.19	/								
C. Social/Psychological Measures																	
1. Perceived quality of life	.17	.10								/							
2. Positive affect	.20	.13								.60	/						
3. CES-D Depression Scale	.17	.12								.46	.59	/					
4. Stress	.18	.13								.46	.51	.39	/				
5. Circle of friends	.02	.05								.18	.19	.09	.06	/			
6. Nervous/emotional problems	.13	.05								.19	.25	.30	.30	.05	/		
D. Measures of General Well-Being																	
1. Self-reported health	.24	.16														/	
2. Current health outlook	.30	.21														.68	/

[1]For ease of presentation, all measures of health status are scored so that high scores indicate poorer condition (e.g., poorer life satisfaction, poorer affect, more depressive symptoms, etc.).

[2]Upper and lower limits for 95% confidence intervals for correlations can be obtained by adding and subtracting the following quantities to the correlations in the table: +/−.044 for correlations between 0 and .30; +/−.039 for correlations of .31 to .45; and +/−.033 for correlations of .46 to .61 For correlations involving the CES-D, corresponding figures are: .053, .047, and .039, due to higher rates of missing data.

health objectives continues, these findings may help to better characterize the role of RAD in older adults and provide added perspective on their place in the more broadly defined health objectives for the elderly for the year 2000. □

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