

Rehabilitation in nursing homes: a cross-national comparison of recipients

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Abstract

Objective: to examine the prevalence of therapy use in nursing homes in selected countries and to describe the characteristics of nursing home residents who receive therapy.

Design and sampling: the design of the study is cross-sectional, using Minimum Data Set (MDS) assessments of nursing home residents. The sample includes all nursing home residents in six US states ($n = 273\,491$), in Copenhagen, Denmark ($n = 3451$), Reykjavik, Iceland ($n = 1254$), and selected locations in Italy ($n = 1089$) and Japan ($n = 1255$).

Method: we determined who had received physical or occupational therapy treatments in the last 7 days. Demographic and clinical characteristics of recipients were compared relative to other nursing home residents within each country.

Results: in the five countries, the prevalence of receiving therapy was 31% (Iceland), 30% (Japan), 23% (Denmark), 14% (Italy) and 11% (USA). Substantial proportions of the recipients were over the age of 85, were clinically stable and had been in the nursing home for longer than 90 days. Across all countries, residents with poorer activities of daily living (ADL) scores but good cognitive scores were more likely to receive therapy than other residents. Rehabilitation nursing, an adjunct to therapy, was concentrated on residents with poor ADL scores.

Conclusions: substantial numbers of long-stay residents receive therapy in nursing homes, including those over the age of 85 years and those with cognitive impairment. Hence, future rehabilitation outcome studies can involve these previously understudied patient populations.

Keywords: *international comparison, nursing homes, rehabilitation*

Introduction

Exercise programmes have been shown to improve the functional performance of nursing home residents, regardless of age. A pre-planned meta-analysis of the Frailty and Injuries: Cooperative Studies of Intervention Techniques trials showed that exercise was associated with a reduction of falls in frail elderly subjects, some of whom were nursing home residents [1]. Fiatarone and associates [2] have shown dramatic increases in strength in very frail nursing home residents. These changes were accompanied by improvements in mobility and spontaneous physical activity. Cognitively impaired residents also showed improvement in walking and urinary continence

following a daily exercise regime [3]. Other nursing home studies, however, have failed to demonstrate a substantial gain from physical therapy [4]. Discrepancies are probably due to differences in residents' characteristics, the programmes provided or to the choice of outcomes.

Little is known about which residents receive therapy in nursing homes or the optimal timing, duration and content of rehabilitation programmes for residents. The use of the Minimum Data Set (MDS) in a number of countries provides the opportunity to compare patterns of therapy use and outcomes. The present study is a first step in examining the use of physical and occupational therapy in nursing homes in selected countries.

Methods

Information on demographic and clinical characteristics of nursing home residents was obtained using the MDS in five countries: the USA, Denmark, Iceland, Italy and Japan. The samples vary in the degree to which they are representative of nursing homes in their respective countries [5]. Registered nurses with experience in long-term care performed MDS assessments in each home, based on resident's records, conversations with staff and interactions with and observations of each resident. In the USA, MDS assessments are mandated in all nursing homes. We used information collected as part of a demonstration project in five states, plus one additional state which routinely computerizes its data. In all other countries, the MDS data were collected as part of special research and training projects.

Recipients of therapy are defined as those residents who received at least 10 min per day of either physical or occupational therapy in the 7 days preceding the assessment, or who received a total of 30 min of therapy or more in the past week. Therapy use in Denmark was coded dichotomously with no time restrictions for the amount of treatment per day. Speech therapy was not included in the definition because of its low prevalence. Although not included in the definition of specialized rehabilitation, we also ascertained the proportion of residents who received a rehabilitation intervention from nursing staff. According to the MDS training manual, nursing rehabilitation is recorded if the duration of nursing restorative care was at least 15 min per day and included activities that assist or promote independence, such as range of motion exercise, dressing and grooming skills and reality orientation.

Due to expected differences in the mix of the resident populations across countries we also examined the proportion of residents receiving therapy within four sub-groups based on a combination of their physical and cognitive function. The residents' activities of daily living (ADL) classification is based on six basic activities of daily living from the MDS: transfers, locomotion, dressing, eating, toilet use, bathing and one bladder continence item. Based on scores for the six items, a six-category ADL self-performance index was created [6]. We dichotomized the ADL index into low and high groups. The low functioning group had scores of 4 or more, indicating that they were totally dependent on two or more ADL items or totally dependent in one ADL item and also incontinent. All others were considered to have high physical functioning. Cognitive functioning was assessed by the cognitive performance scale which scores residents' performance in decision making, making themselves understood, short-term memory, ADL performance in eating and whether the resident is in a coma [7]. The high cognitive function group included patients whose

cognitive performance scale scores suggested their cognitive abilities were mildly impaired, borderline or intact. All other patients were placed in the low cognitive functioning group. The groups are labelled: good physical and cognitive, poor physical and cognitive functioning, good physical and poor cognitive, and poor physical and good cognitive functioning. Given the restricted range of ability of nursing home residents, the good functioning residents should be considered as relatively better but not necessarily independent in ADL performance.

We examined the proportion of residents within each country with specific demographic or clinical characteristics that might be associated with therapy referrals. Examples include recent changes in functional status, recent falls and pain. Due to the non-representativeness of some of the samples and the differential size of study populations, we did not specify any hypotheses or perform any statistical testing.

Results

As shown in Table 1 the total number of nursing home residents included from each country was 273 491 (USA), 3451 (Denmark), 1254 (Iceland), 1089 (Italy) and 1255 (Japan). Information on the use of therapy was missing in 7% of US cases but less than 1% in Italy and Denmark. Iceland and Japan had no missing information on this data element. The percentage of residents currently receiving either physical or occupational therapy was 31% (Iceland), 30% (Japan), 23% (Denmark), 14% (Italy) and 11% (USA). Most recipients were receiving physical therapy; far fewer were receiving occupational therapy. The highest prevalence of occupational therapy was found in Japan (12%) and the lowest in Italy (2%). Residents in Italy were least likely to receive both physical and occupational therapy (0.2%) while the USA had the highest proportion with combined use (8.1%). In any given country less than 2% of nursing home residents received speech therapy. Nursing rehabilitation interventions varied greatly from 55% in the USA to only 11% in Italy.

Table 1 also contrasts the characteristics of residents who do and do not receive therapy, across each of the five countries. Use of therapy does not appear to be influenced by gender, except in Italy where males comprise a smaller proportion of the therapy group (9%) than the remainder of the nursing home residents (23%). In all countries, residents over the age of 85 are less likely to receive therapy but the under-representation is most marked in Japan, where 41% of non-recipients but only 20% of those receiving therapy are older than 85 years.

In the USA, 54% of therapy recipients had been in the nursing home for less than 1 month and 57% were

Table 1. Characteristics of nursing home residents who do or do not receive physical or occupational therapy

| Characteristic | Percentage, by country | | | | | | | | | |
|-------------------------------|------------------------|--------------------------|----------------------|-------------------------|----------------------|-------------------------|----------------------|-------------------------|-------------------------|-----------------------------|
| | Denmark | | Iceland | | Italy | | Japan | | USA | |
| | Therapy (n = 794) | No therapy (n = 2655) | Therapy (n = 392) | No therapy (n = 862) | Therapy (n = 149) | No therapy (n = 921) | Therapy (n = 378) | No therapy (n = 877) | Therapy (n = 29 587) | No therapy (n = 239 145) |
| Sex (male) | 24 | 24 | 29 | 35 | 9 | 23 | 30 | 28 | 30 | 27 |
| Age (years) | | | | | | | | | | |
| <65 | 5 | 4 | 3 | 1 | 7 | 3 | 10 | 3 | 8 | 6 |
| 66-74 | 13 | 10 | 11 | 8 | 13 | 15 | 20 | 12 | 15 | 12 |
| 75-84 | 37 | 34 | 41 | 36 | 44 | 44 | 51 | 45 | 36 | 34 |
| 85 and over | 45 | 52 | 45 | 54 | 36 | 39 | 20 | 41 | 41 | 48 |
| Previous location | | | | | | | | | | |
| Home | 61 | 63 | 63 | 70 | 47 | 60 | 42 | 45 | 22 | 35 |
| Hospital | 16 | 14 | 18 | 11 | 37 | 28 | 5 | 4 | 57 | 38 |
| Other | 23 | 24 | 19 | 19 | 16 | 11 | 53 | 50 | 21 | 27 |
| Current length of stay (days) | | | | | | | | | | |
| <31 | 2 | 3 | 1 | 1 | - | - | 0 | 0 | 54 | 17 |
| 31-90 | 8 | 8 | 5 | 3 | - | - | 10 | 5 | 2 | 1 |
| >90 | 90 | 90 | 95 | 96 | - | - | 90 | 95 | 44 | 82 |
| Rehabilitation potential | | | | | | | | | | |
| Self rating | 13 | 6 | 7 | 3 | 30 | 13 | 46 | 26 | 21 | 5 |
| Staff assessment | 23 | 13 | 16 | 7 | 48 | 31 | 49 | 32 | 28 | 9 |
| Clinical status | | | | | | | | | | |
| Deteriorated | 14 | 15 | 16 | 21 | 10 | 6 | 7 | 9 | 38 | 14 |
| Stable | 77 | 79 | 73 | 74 | 72 | 89 | 74 | 84 | 55 | 82 |
| Improved | 10 | 6 | 10 | 5 | 17 | 5 | 19 | 8 | 8 | 4 |
| Daily joint pain | 29 | 23 | 24 | 23 | 30 | 17 | 18 | 18 | 25 | 13 |
| Fall in past 30 days | 13 | 12 | 7 | 5 | 8 | 8 | 3 | 4 | 25 | 10 |

admitted from an acute care hospital, whereas 82% of non-recipients had been in the nursing home for more than 90 days and far fewer had been admitted from hospital. By contrast, in Denmark, Iceland and Japan there is no relationship between length of stay and receipt of therapy.

In all countries, therapy recipients were more likely to be rated as having rehabilitation potential; however, the proportion of positive ratings was quite low. For example, in Iceland, only 7% of the therapy group thought they could improve and only 16% were judged by staff to have rehabilitation potential. In Japan, both figures were higher, but still less than 51% of residents receiving therapy were considered to have potential to improve.

Certain clinical signs such as recent falls, joint pain and changes in clinical status provide additional indications that therapy in the USA, unlike other countries, is associated with a recent acute event. In comparison to the other countries, fewer residents receiving therapy in the USA were stable (54%) and more residents (38%) had had a recent deterioration in status. In addition, compared with other residents, therapy recipients were more likely to have had a recent fall and to have daily joint pain. In contrast, in the other countries most residents (>72%) receiving therapy were rated as stable, with no recent improvement or deterioration in clinical status.

Table 2 illustrates the variation in the case-mix of residents across the five countries and the proportion receiving physical or occupational therapy within each stratum of functional and cognitive ability. Across all countries, residents with poor ADL but good cognitive function were more likely to receive physical therapy than other residents. Despite this consistency, there was marked variation in the proportion of this group receiving therapy—from 18% in the USA to 59% in Iceland. There was no consistent pattern of occupational therapy utilization across countries but rehabilitation nursing, which is an adjunct to specialized therapy, was consistently focused toward residents with poorer ADL functioning.

Discussion

We were concerned that factors such as reimbursement constraints, staffing shortages and/or a negative attitude about the potential of older adults to benefit from therapy might restrict access to specialized rehabilitation in nursing homes given previous US findings that the oldest old face restrictions in access to rehabilitation in the community [8] and in specialized rehabilitation centres [9]. The proportion of therapy recipients in the five countries exceeded our expectations, varying from approximately 30% in Iceland and Japan to 11% in the USA, and permitted a

Table 2. Distribution of functional status (activities of daily living; ADL) and cognitive scores (cognitive performance scale; CPS) by country and the row percentages indicating the proportion within each group who receive physical or occupational therapy or nursing rehabilitation

| Country | Scores | Total | | Percentage of group, by treatment received (%) | | |
|---------|-------------------|----------|------|--|----------------------|------------------------|
| | | <i>n</i> | % | Physical therapy | Occupational therapy | Rehabilitation nursing |
| Denmark | High ADL/good CPS | 1106 | (32) | 17 | 8 | 21 |
| | High ADL/poor CPS | 641 | (19) | 10 | 6 | 25 |
| | Low ADL/good CPS | 658 | (19) | 38 | 8 | 39 |
| | Low ADL/poor CPS | 1029 | (30) | 16 | 4 | 33 |
| Iceland | High ADL/good CPS | 572 | (46) | 29 | 1 | 15 |
| | High ADL/poor CPS | 188 | (15) | 34 | 4 | 38 |
| | Low ADL/good CPS | 114 | (9) | 59 | 10 | 45 |
| | Low ADL/poor CPS | 358 | (29) | 28 | 3 | 43 |
| Italy | High ADL/good CPS | 328 | (32) | 7 | 2 | 14 |
| | High ADL/poor CPS | 136 | (13) | 8 | 4 | 10 |
| | Low ADL/good CPS | 177 | (17) | 22 | 2 | 27 |
| | Low ADL/poor CPS | 401 | (38) | 15 | <1 | 18 |
| Japan | High ADL/good CPS | 580 | (47) | 26 | 14 | 21 |
| | High ADL/poor CPS | 129 | (10) | 13 | 15 | 49 |
| | Low ADL/good CPS | 130 | (10) | 32 | 8 | 33 |
| | Low ADL/poor CPS | 174 | (32) | 25 | 10 | 43 |
| USA | High ADL/good CPS | 79 740 | (30) | 10 | 8 | 39 |
| | High ADL/poor CPS | 34 220 | (13) | 5 | 4 | 36 |
| | Low ADL/good CPS | 47 387 | (18) | 18 | 15 | 67 |
| | Low ADL/poor CPS | 107 662 | (40) | 10 | 7 | 67 |

reasonable comparison between therapy recipients and non-recipients.

Older adults and those with poorer cognitive function were somewhat less likely to receive therapy, but approximately 40% of therapy recipients in four of the countries were over the age of 85 years. Cognitively impaired residents were most likely to receive therapy in Iceland (28–34%). Across all countries, however, residents who have good cognitive but poor ADL functioning are the most likely to receive therapy. This pattern may reflect the belief that cognitively intact patients benefit more from specialized rehabilitation. The latter assumption would contrast with recent findings that geriatric patients with cognitive dysfunction show similar gains in functional status following specialized rehabilitation [10].

The location from which the residents were admitted and the distribution of length of stay illustrate the role of the US nursing home in providing post-acute care. Over half the US residents receiving therapy came from a general hospital and had been admitted within the last 30 days. This finding is consistent with an increased use of post-acute care in the USA, particularly skilled nursing facilities [11, 12]. In other countries, however, there are fewer short-stay residents and they are no more likely to be receiving therapy than other residents.

Longer stay residents in the USA are much less likely to receive therapy than other residents, possibly due to reimbursement constraints once the post-acute period ends. This practice contrasts with evidence that supports treatment for older long-stay nursing home residents [2, 13] as well as rehabilitation programmes of longer duration or resumption of therapy past the post-acute phase of the condition. Dam and associates [14] found improvements in walking ability and functional status following extended periods of rehabilitation for patients who could not ambulate but had been discontinued from therapy at 3 months post-stroke because of lack of functional improvement. Tangeman and associates [15] reported improvements in functional performance following an intensive course of therapy for community dwelling seniors whose stroke had occurred more than 1 year earlier. Both studies support the need to reconsider the belief, perhaps more common in the USA, that rehabilitation is most appropriate only in the early recovery period.

Nursing rehabilitation was reported predominantly for residents with poorer functional performance. This pattern may suggest that these patients were not rehabilitation candidates or that nursing staff had taken over maintenance activities. It is, however, disappointing to see that the use of nursing rehabilitation is not higher across all groups. It would not be unreasonable to expect that any specialized therapy be accompanied by nursing rehabilitation to give a more consistent approach to patient care. The use of

occupational therapy was also low, considering the extent of functional deficits in this population.

The cross-sectional nature of the study limits our ability to examine the outcomes of specialized rehabilitation and excludes residents who have completed a course of rehabilitation treatments in the past. Neither do we have reliable data on the intensity of treatments given across countries, and nor do we know whether the treatments were individualized or offered in groups. Nonetheless, we feel this study offers a starting point for discussion and a basis for planning additional studies. We have noted that within each country a larger proportion of the therapy group has had a recent improvement in status but we cannot tell if the improvement occurred as a result of the therapy or if the improvement prompted the referral.

Prospective clinical trials offer the strongest evidence for the effectiveness of treatments but they are expensive. Moreover, reimbursement patterns in specific countries may limit the degree to which one can investigate new treatment approaches. Use of common multi-dimensional assessments offers an opportunity to design longitudinal studies comparing interventions and outcomes for similar patients across varied practice patterns. There is also an opportunity to examine outcomes for long-stay nursing home residents and those over the age of 85, groups that are under-studied in the rehabilitation literature.

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