

Postprint Version	1.0
Journal website	http://www.kurtis.it/abs/index.cfm?id_articolo_numero=3844
Pubmed link	http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=17726364&ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.ResultsPanel.Pubmed_RVDocSum
DOI	

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Variations in quality of Home Care between sites across Europe, as measured by Home Care Quality Indicators¹.

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ABSTRACT

Background and Aims: The increase in the proportion of elderly people and a consequent increase in the demand for care has caused healthcare systems to become overloaded. This paper describes the use of Home Care Quality Indicators (HCQIs), derived from the Minimum Data Set for Home Care, for monitoring quality of care. Research questions were, “Do HCQI scores vary between home care organizations in different countries?” and “Are one or more country-specific sites consistently scoring better on most or all HCQIs?”

Methods: a cross-sectional observational study of 65+ randomly selected clients of home care organizations in urban areas in 11 European countries who had been receiving home care for at least two weeks. Data were collected with the MDS-HC. The scoring of 16 prevalent quality indicators for home care, adjusted for population differences was calculated with baseline data.

Results: Population size at baseline was 4,007 clients. Among home care clients in Europe, “rehabilitation potential in Activities of Daily Living and no therapies” (average 66.1%) and “inadequate pain control” were the most common quality problems. The prevalence between populations studied in various countries varied substantially. No country-specific site consistently scored worst or best.

Conclusions: HCQIs derived from the MDS-HC detect variance in quality scores between home care in the 11 partner countries. The highest prevalence of unwanted outcomes were most often found in the Czech Republic, Italy and Germany. Although further research is necessary, we believe that HCQIs may be of great value for quality improvement in home care.

INTRODUCTION

An increase in the proportion of elderly people and a consequent increase in the demand for care has caused healthcare systems to become overloaded. Nevertheless, government, institutions and clients themselves continue to demand high quality. Home care is an important part of healthcare, because of its linking function between community and institutional care. Clients receiving home care may be at a crucial turning point in their lives. Good-quality home care may provide prolonged independent life in the community, whereas sub-optimal care may cause an unnecessary decline in health (1).

The quality of care is a complex, multi-dimensional concept. The US Institute of Medicine (IOM) defines it as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes which are consistent with current professional knowledge” (www.iom.edu). Much research has been done into the improvement of quality of care, ranging from monitoring methods (e.g., clinical databases, epidemiological studies, mortality and morbidity statistics) to monitoring aspects that potentially affect the quality of care (hospital organization, patient and physician characteristics). One method of identifying potentially good and poor quality of care is the use of quality indicators, which may be defined as “markers that indicate either the presence or absence of potentially poor care practices or outcomes”. The aim of quality indicators is to identify clinical areas that can benefit from improvements in the care process and to define the performance of individual care providers (1-3).

Quality indicators

Quality indicators for home care may be derived from the interRAI (www.interrai.org) Minimum Data Set for Home Care (MDS-HC). This is a validated multidimensional assessment tool for elderly people aimed at improving clinical practice (4, 5). The primary goal of RAI systems is assessment of client care needs, followed by analysis of required and administered care, with the objective of drawing up an optimal personalized care plan. The instrument comprises a structured screening questionnaire, the Minimum Data Set for Home Care (MDS-HC), which is completed by trained nurses.

Several studies have proved the value of using quality indicators derived from the MDS for improving the quality of care in nursing homes (6-8). In a quality improvement study in Missouri in the United States, for example, a clinical nursing specialist in gerontology supports quality improvement activities in nursing homes. This nurse assists nursing homes in improving the quality of their nursing facility care, based on quality indicator scores (9). However, research has been less intensive on quality indicators derived from the MDS-HC with regard to home care.

This paper presents scores on Home Care Quality Indicators (HCQIs) for home care organizations in 11 European countries. The aim is to identify quality of care problems and to study the possibilities of using HCQIs to detect differences in quality of care, so that quality improvement actions can be planned. Therefore, HCQIs should discriminate between countries. This resulted in the following research questions: “Do HCQI scores vary between home care organizations in different countries?” and “Are one or more country-specific sites consistently scoring better on most or all HCQIs?”.

METHODS

Study population

The study was performed in urban sites which the researchers in the 11 European partner countries (Czech Republic, Denmark, Finland, France, Germany, Great Britain, Iceland, Italy, the Netherlands, Norway, Sweden) considered to be generally representative of urban areas within their countries (10). The target population was all subjects within the study site receiving community care services for at least two weeks. Specific services were provided (e.g., “integrated health and social care” (home care organizations that provide ‘care’ [like wound care, medicine management, etc.] as well as ‘help’ [like housekeeping] or “separated health and social care services” [different authorities are responsible for delivering health and social care]). If the number of enrolled clients per country was higher than 405 (aimed study sample per country), subjects were selected by computer-driven randomization. The sampling was stratified to give a sample representative of the two groups receiving integrated and social care. Nurses from home care agencies or research assistants collected data using the MDS-HC assessment instrument. The assessments started in September 2001, continued with 6-month and 1-year follow-ups. Data collected at baseline were used to answer the research questions in this paper.

Measuring instruments

The MDS-HC was used for data collection. This assessment tool consists of over 300 items derived from literature research, and has excellent inter-observer reliability. It records their physical, cognitive and psychosocial characteristics of clients and their service utilization (4). The MDS-HC is currently being used in North America (Canada, and many states and the Department of Veterans Affairs in the US), Europe (Italy, Switzerland, Finland, the Netherlands), and Asia (Hong Kong, Japan) and Australia (see www.interrai.org). Assessments were conducted by agency personnel in one group of participating countries (Finland, France, Germany, Iceland), whereas assessments were conducted by research assistants recruited for the project in the remaining countries. Differences in methods used by individual countries may have had an effect on the HCQI outcomes. These prevalence rates may indicate the way in which MDS assessments were performed and the completeness of the assessments. However, there were hardly any missing data and good, average and low scoring countries were found in both groups.

On the basis of MDS-HC data, 22 HCQIs may be calculated (1). We used baseline data to answer current research questions. Baseline data suffices for the calculation of 16 prevalence HCQIs (Table 1), which HCQIs always refer to an unwanted outcome. Higher HCQI scores indicate a higher prevalence of unwanted outcomes among the clients of the home care organizations of the individual partner countries. Thus, the higher the score, the worse the quality of care.

[TABLE 1]

Analysis

The HCQI scores are calculated from the scores on a number of items. These were first calculated for the individual client (yes/no/not applicable) and then summed per agency in a numerator/denominator ratio (the specific HCQI). Some clients were excluded (e.g., terminally ill clients, when calculating the weight HCQI). If, for example, 80 out of 100 included clients met the indicator criteria (scoring on a number of items) the prevalence of the particular HCQI outcome for that agency was 80% of included clients (Table 1). Thus, unadjusted HCQI scores reflect the proportion of eligible clients who actually underwent an unwanted outcome.

However, individual home care clients face differential risks of specific unwanted outcomes given their varying health and functional status, i.e., the case mix of home care agencies varies (1). Some of these predisposing client characteristics increase the risk of adverse HCQI outcomes, independently of quality of care. HCQIs derived from the MDS-HC can be adjusted by applying risk adjustment. The adjustment includes only those factors associated with the HCQI that would, as such, not be considered quality issues under the control of the home care organization (1). Four of the 16 HCQIs in this study have no adjusting variables (Table 1). Examples of adjusting variables are “cognitive impairment”, “Activities of Daily Living”, “depression”, certain disease diagnoses, “age” (being 75 years or older) and “having unsteady gait”. The adjusted HCQI scores reflect the rank of the country performance on that particular HCQI,

compared with other countries. To answer the research questions posed in this paper, we used the adjusted HCQI scores.

In order to give an overall comparison of the ranking of the 11 different countries on each quality indicator, we identified scores above the 90th and 75th percentiles (worst and second worst scoring country) for the whole study population. A percentile rank is the proportion of scores in a distribution that a specific score is greater than or equal to. In their study of all nursing homes in six U.S. states, Zimmerman et al. (11) have shown that these boundaries are useful in identifying potentially sub-standard quality of care on most of the nursing home quality indicators. By assigning a 'penalty point' score of 1 to every 75th percentile score or above and 2 to every 90th percentile score or above, a summary performance score was constructed, in order to compare the overall level of quality of care. Thus, countries with the highest penalty scores have the highest prevalence of indicators of 'poor' quality, and rank the lowest overall.

RESULTS

Population

The study population was 4,007 people aged 65 and over, who were already receiving home care services at the start of the study and were living in urban areas. The sample is representative of the urban areas from which data was collected. Two-thirds (2729 clients) were receiving home nursing (sometimes in addition to other home care services); 695 were receiving home help (sometimes in addition to other home care services, except home nursing); and 583 were receiving services other than home nursing or home help (mostly meals on wheels [N=92] and physiotherapy [N=81]). The mean age was 82 (sd=7,32). Hours of formal care varied widely between and within countries. Grouped median hours of formal care were the highest in England (6.9 hours per week) and lowest in Italy (1.3 hours per week). Because 'hours of care' were not normally distributed, we used grouped medians to describe 'hours of care'. Based on tradition and differences in health care systems, the service provision as a whole was very different both between and within participating countries.

[TABLE 2]

Variation in adjusted quality indicator scores

Table II shows the adjusted HCQI scores per country, the average and the range per HCQI. A score of 4.4 (average adjusted score for "prevalence of neglect or abuse") means that, in more than 4% of the eligible respondents (see Table 1), a sign of potential neglect or abuse was observed. The higher the score, the higher the number of possibly abused clients.

Of all HCQIs, "Rehabilitation potential in Activities of Daily Living and no therapies" was most prevalent, i.e., had the highest score (average 66.1%). Clients eligible for this particular HCQI were those with a decline in self-performed ADL (Activities of Daily Living), who were able to understand others and who had the potential for better performance in functioning. This quality indicator was triggered when no exercise, occupational or physical therapy was given or prescribed to assist clients in improving their ADL performance. The worst scores (having the highest prevalence of this unwanted outcome) for this quality indicator was the Czech site (98.6%) and the best performing in this respect was the Norwegian site (58.2%) (Table 2). Second most prevalent was the HCQI for "Inadequate control among those with pain". The average country score was 41.2% (range 23.3% - 68.4%). Worst was the Danish site (68.4%) and best the Norwegian site (23.3%). The third most prevalent HCQI was "Prevalence of not receiving influenza vaccination in the last two years" (average 37.0%, range 12.2% - 69.2%). The lowest prevalence was found in the Dutch site and the highest in the Czech site. Also 'Social isolation' and 'Disruptive or intense daily pain' were quality problems with a high prevalence among European home care sites (both with a prevalence of more than 30%).

The two HCQIs with the lowest adjusted agency level rates were "Prevalence of neglect or abuse" and "Prevalence of inadequate meals" (both with an average score of 4.4%). "Prevalence of dehydration" rated third lowest, with an average score of 6.5%.

Overall performance on HCQIs

To create an overall ranking order, we calculated the summary performance score based on ‘penalty points’ ascribed for having a score above the 75th percentile (one point) or one above the 90th percentile (one extra point). In this light, the home care organizations in the Czech Republic, Italy, the United Kingdom and Germany had the highest prevalence of unwanted outcomes (Table 3). The best performing sites, as indicated by the prevalence of adjusted HCQIs, were Iceland, Norway and France, with only one or two ‘penalty points’.

[TABLE 3]

Table 3 shows that, except for the Icelandic and Norwegian sites, all other sites scored at least once above the 90th percentile of unwanted outcomes. Although the Czech Republic received most penalty points, they scored best on ‘Neglect or abuse’. Thus, none of the countries scored consistently best or worst.

DISCUSSION

This European study showed that differences in quality of care do exist between selected home care sites, indicating the potential to benefit from experiences in sites with better scores. HCQI scores were very different for the sites within the various countries for most of the HCQIs. The difference between lowest and highest percentages also varied considerably (from 4.4% (“Neglect or abuse”) to 75.9% (“Rehabilitation potential in Activities of Daily Living and no therapies”). The HCQIs, which are newly developed by Hirdes et al (1) and not yet intensively examined on usability, do seem to be discriminating. HCQIs may therefore be a powerful tool for quality improvement in home care organizations.

In our study population from 11 European home care sites, the most prevalent HCQI was “Rehabilitation potential in Activities of Daily Living and no therapies” (75.9%). An HCQI should be a measure of the quality of care of home care organizations. However, in most European countries therapies like exercise, occupational or physical therapy are not provided by home care agencies themselves, but are initiated by GPs. So scores on this HCQI mirror utilization of these therapies by individual clients, not their provision by home care organizations. Nevertheless, nurses may be expected to spot the needs of elderly people for these therapies. Hirdes et al. (1) almost found the same high score (74.5%) in their study among Canadian and American home care clients.

According to the adjusted HCQI country scores, care providers in the Czech, Italian and German sites had the worst outcomes and should be examined more closely. They may improve by learning from other sites with lower unwanted outcomes. Therefore, searching for reasons for best practises are needed. Many variables are important, e.g., the number of staff available per client, professional training of caregivers, etc.

To evaluate the quality of home care, the adjusted HCQI scores were used to compare risk adjusted populations. Researchers involved in this study were again concerned about the comparability of the study sample. In some countries, more cognitively and ADL impaired clients were included than in others. Nordic countries, England and the Netherlands included many mild cases, whereas Italy, France, Germany and the Czech Republic had few mild cases. To rule out a confounding influence of ADL and cognition status, we computed and compared the HCQI scores from complete samples and samples excluding clients without ADL or cognitive impairment. The results were not significantly different for 11 of the 16 HCQIs, although 10 of these 11 had a lower prevalence in the split sample (but not more than 25% less); one HCQI had a higher prevalence. In four other HCQIs (abuse, delirium, negative mood, dehydration) the prevalence was much lower (more than 50%), and the fifth HCQI (weight loss) scored about 40% lower. Especially for HCQIs with more than 50% lower prevalence, the ranking between countries changed significantly. Except for these 5 HCQIs with already low prevalence, HCQIs are suitable to be used for global comparisons among our sites.

Some limitations of this study must be mentioned. First, the target population derived no direct benefit from participating in the study. This may have resulted in high refusal rates in some countries, which may have skewed our results. We have no exact data on reasons to drop-out at baseline. Second, all HCQIs were given equal weighting in the scoring system used to create an overall ranking order. This is not entirely justified. Let us take the example of a quality indicator which produced a low average prevalence (e.g., prevalence of neglect or abuse), and assume that all sites performed well on that indicator, with not much

difference between the sites in the various countries. Nevertheless, sites scoring above the 75th or 90th percentiles received penalty points for the overall ranking order. The overall ranking order is therefore obviously of less importance than the indication of which sites (and which countries) perform well and better on individual HCQIs. Third, not all the adjusting factors identified in the study by Hirdes et al. (1) turned out to be significant in our study. Instead, some potential adjusting factors, which were not significant in the above study, may have existed in our study. To maintain the comparability of our data with studies performed elsewhere in the world, we did not include these factors in our model.

The World Health Organisation Report of 2000, which generated so much attention and debate, ranked countries' health services by performance in a number of measures in relation to goal attainment, health expenditure per capita and system performance (12). We added care outcome measures which may be used in the same way.

CONCLUSIONS

Home Care Quality Indicators are very useful in assessing the overall quality of care and individual areas of poor or suboptimal care. They offer the potential to target quality improvement actions for home care organizations identified as having particularly unwanted care outcomes. Although it is hard to draw conclusions about clients and agencies with "good" and "bad" scores, calculation of HCQIs makes it possible to distinguish better and worse care practices for each HCQI. Within Europe, it may be possible to create a "European average performance" for each QI, so that equal quality standards can be ensured and requested by users and regulatory authorities in individual countries, regardless of funding and structure of home care.

Future goals are: a) to validate HCQIs in Europe, as the original validation study comes from outside Europe, i.e., Canada and the USA; b) to implement the use of HCQIs routinely in European home care; and c) to identify the key factors for suboptimal care.

Organizational differences and differences in the care policy of each of the countries must be examined in order to provide suggestions for quality improvement. There may be a difference in the policy on the macro level (e.g., better integration of services and a difference in the eligibility criteria for certain parts of provision) or the introduction of information and public relation programs (for instance, influenza vaccination programs to increase the proportion of clients). But the management of home care services may also differ. Some may have to be scrutinized, to optimize services and their structural aspects (e.g., number of clients per nurse, number of clients per assistant nurses, team meetings, participation of informal caregivers, multidisciplinary team approach, staff training) to improve the outcomes of care and to reduce differences on national and European levels.

ACKNOWLEDGMENTS

The AD HOC Project was funded by the EC under 5th FP grant QLK6-2000-00002. The authors wish to express their gratitude to *interRAI* and the full AD-HOC research team.

TABLES

Table 1 - Description of the 16 home care quality indicators (HCQIs) used in this study.

Home Care Quality indicators	Description
<i>Prevalence of neglect or abuse</i>	Clients who are afraid for family members or caregivers, who show unusually poor hygiene, who have unexplained injuries or who are neglected, abused, mistreated or physically restrained.
<i>Prevalence of inadequate meals</i>	Clients eating 1 meal or less in 2 of the last 3 days. - Adjustment for 'terminally ill clients'.
<i>Prevalence of social isolation</i>	Clients who are alone long periods of time or all the time AND clients who state that they feel lonely OR who have a decline in social activities which makes them feel distressed. - Adjustment for 'complexity of health status' (being able to make decisions, shortness of breath, unintended weight loss, etc.), 'cognitive impairment' and 'having feelings of poor health'.
<i>Prevalence of no assistive device among clients with difficult locomotion</i>	Clients who require supervision, limited, extensive or maximal assistance, or who are totally dependent in locomotion around or outside the home AND who use no assistive device (excluding clients without indoor locomotion). - Adjusting factors are 'cognitive impairment', 'difficulty in dressing', and 'unsteady gait'.
<i>Prevalence of inadequate control among those with pain</i>	Clients with pain, not adequately controlled by prescribed pain medication. - Adjustment for 'cognitive impairment', 'complexity of health status', 'flare-up of a chronic problem' and 'arthritis'.
<i>Prevalence of ADL/rehabilitation potential and no therapies</i>	Clients with possible ADL rehabilitation but exercise therapy, occupational therapy or physiotherapy is not applicable or scheduled and not received.
<i>Prevalence of weight loss</i>	Clients with an unintended weight loss of 5% or more in last 30 days or 10% or more in last 180 days (except clients with end-stage disease). - Adjusted for 'poor ADL performance' and diagnosis of 'cancer'.
<i>Prevalence of not receiving flu vaccine in last 2 years</i>	Clients who did not receive influenza vaccination (excluding clients who receive chemotherapy or radiation therapy).
<i>Prevalence of hospitalisation</i>	Clients who have been hospitalized, visited the hospital emergency department or received emergency care in last three months. - Adjustment for clients who receive 'post-hospital home care', or who have 'edema'.
<i>Prevalence of any injuries</i>	Clients with fractures, second- or third-degree burns, or unexplained injuries. - Adjustment for clients who limit going outdoors due to fear of falling (e.g., stopped using buses, goes out only with others) and 'osteoporosis'.
<i>Prevalence of delirium</i>	Clients with sudden or new onset/change in mental function OR clients who have become agitated or disoriented such that their safety is endangered, or protection by others is required. - Adjustment for 'cognitive impairment' and 'end-stage disease'.
<i>Prevalence of negative mood</i>	Clients with sad mood AND at least 2 symptoms of functional depression (e.g., 'persistent anger with self or others', 'repetitive health complaints', 'sad, pained, worried facial expressions', 'recurrent crying, tearfulness', 'withdrawal from activities of interest', 'reduced social interaction', unintended weight loss'). - Adjustment for 'short-term memory problems', 'having feelings of poor health', 'experiencing a flare-up of a recurrent or chronic problem' and 'being 75 years or older'.
<i>Prevalence of disruptive or intense daily pain</i>	Clients with daily pain which is intense or which disrupts activities. - Adjustment for 'experiencing a flare-up of a recurrent or chronic problem' and 'complexity of health status' (being able to make decisions, shortness of breath, unintended weight loss, etc.).
<i>Prevalence of no medication review by at least one physician</i>	Clients whose medications have not been reviewed by a physician within the last 180 days (when at least 2 medications are taken).
<i>Prevalence of dehydration</i>	Clients with insufficient fluid intake during last 3 days (at least 1,5 litres). - Adjusted for 'poor ADL performance' and 'end-stage disease'.
<i>Prevalence of falls</i>	Clients who record a fall (and who are not completely dependent in bed mobility). - Adjustment for 'age' (55 years and older) and 'unsteady gait'.

Table 2 - Prevalence of adjusted Home Care Quality Indicator scores by country.

HCQIs	Czech Rep.	Denmark	Finland	France	Germany	Iceland	Italy	Netherlands	Norway	Sweden	United Kingdom	Average %	Difference ¹
Neglect or abuse	1.6	1.9	2.1	10.0	9.4	2.0	12.4 ²	3.5	2.1	<u>1.6</u> ³	2.1	4.4	10.8
Inadequate meals	5.4	5.3	<u>0.5</u>	1.5	4.7	1.3	9.9	6.0	2.4	7.9	3.5	4.4	9.4
Social isolation with distress	46.9	<u>21.9</u>	48.4	25.6	24.0	35.7	26.4	39.5	41.6	33.0	33.2	34.2	26.5
Difficult locomotion and no assistive device	6.5	10.1	13.7	<u>4.5</u>	14.4	14.3	5.1	5.5	6.1	— ⁴	8.9	8.9	9.9
Inadequate pain control	28.8	68.4	25.0	45.0	58.6	27.5	42.5	38.0	<u>23.3</u>	57.7	38.8	41.2	45.1
ADL/rehab potential and no therapies	98.6	84.0	82.1	62.9	82.2	71.2	61.3	72.4	<u>58.2</u>	77.8	84.1	75.9	40.4
Weight loss	17.4	10.3	<u>1.7</u>	9.1	8.9	11.0	16.3	17.3	15.2	11.8	21.5	12.8	19.8
No flu vaccination	69.2	24.5	36.1	21.9	67.4	24.6	37.3	<u>12.2</u>	64.2	26.9	23.2	37.0	57.0
Hospitalization	24.2	27.8	27.0	19.0	22.9	<u>14.2</u>	52.4	—	20.5	20.5	32.0	26.0	38.3
Any injuries	25.1	16.2	9.1	12.3	13.4	18.0	22.2	<u>8.3</u>	18.1	21.5	10.3	15.9	16.8
Delirium	5.5	<u>4.2</u>	—	5.9	21.1	4.2	9.7	17.1	5.9	9.3	10.3	9.3	17.0
Negative mood	24.7	7.8	<u>2.1</u>	17.1	6.9	8.2	18.6	13.6	9.2	4.1	18.0	11.8	22.6
Disruptive/intense daily pain	36.0	31.2	33.8	31.3	28.8	24.9	30.9	31.8	<u>24.0</u>	26.5	38.3	30.7	14.3
Not receiving med review by MD	—	31.5	22.7	<u>3.4</u>	15.5	9.7	3.8	20.8	4.9	19.6	57.4	18.9	54.0
Dehydration	20.4	2.4	<u>0.6</u>	1.7	10.7	1.4	6.8	16.7	1.4	7.8	1.5	6.5	19.8
Falls	33.2	26.2	27.0	22.6	20.4	22.1	36.2	29.0	26.8	<u>15.7</u>	32.6	26.5	20.5

¹Difference between lowest and highest percentages; ²Bold italics: indicates highest, i.e., worst score for HCQI; ³Underlined: indicates lowest, i.e., best score for HCQI; ⁴score could not be calculated due to shortage of eligible clients (see Table 1) for adjustments.

Table 3 - Adjusted HCQI score¹; summary.

HCQIs	Czech Rep.	Denmark	Finland	France	Germany	Iceland	Italy	Netherlands	Norway	Sweden	United Kingdom
Neglect or abuse				2	1		2				
Inadequate meals							2	1		2	
Social isolation with distress	2		2						1		
Difficult locomotion and no assistive device			1		2	1			— ²		
Inadequate pain control		2			2					1	
ADL/rehab potential and no therapies	2	1									2
Weight loss	2							1			2
No flu vaccination	2				2				1		
Hospitalization		1					2				1
Any injuries	2						2			1	
Delirium			—		2			1			1
Negative mood	2						2				1
Disruptive/intense daily pain	2		1								2
Not receiving med review by MD	—	1	1								2
Dehydration	2				1			2			
Falls	2						2				1
Total	18	5	5	2	10	1	12	5	2	4	12
RANK	11	5	5	2	8	1	9	5	2	4	9

¹Scores $\geq 90^{\text{th}}$ -percentile receive 2 penalty points; scores $\geq 75^{\text{th}}$ -percentile receive 1 penalty point; ²score could not be calculated due to shortage of eligible clients (see Table 1) for adjustments.

Bos JT, Frijters DH, Wagner C, Carpenter GI, Finne-Soveri H, Topinkova E, Garms-Homolová V, Henrard JC, Jónsson PV, Sørbye L, Ljunggren G, Schroll M, Gambassi G, Bernabei R.

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Aging Clinical and Experimental Research: Vol. 19, 2007, nr. 4, p. 323-329.



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