Research Article

Clinical Outcomes and Quality of Life of Home Health Care Patients

Suk Jung Han, PhD, RN,1 Hyun Kyung Kim, PhD, RN,2 Judith Storfjell, PhD, RN, FAAN,3 Mi Ja Kim, PhD, RN, FAAN3

1 Department of Nursing, Sahmyook University, Seoul, South Korea
2 College of Nursing, Chonbuk Research Institute of Nursing Science, Chonbuk National University, Jeonju, South Korea
3 College of Nursing, University of Illinois at Chicago, Chicago, United States

SUMMARY

Purpose: This study aimed to evaluate the quality of life (QOL) in home health care patients according to change in health status outcomes between the start of care and discharge or 60 days, whichever came first.

Methods: This is a prospective descriptive study. The convenience sample consisted of 100 home health care patients, who started receiving home health care services from a home health care agency in the United States. The World Health Organization Quality of Life Scale-Brief (WHOQOL-BREF) was used for measuring QOL; activities of daily living (ADLs) and instrumental ADLs were collected from the Outcome and Assessment Information Set data via Centers for Medicare and Medicaid Services-required home health agencies. Descriptive statistics, paired t tests, and multiple linear regressions were used for data analysis.

Results: ADLs and instrumental ADLs of participants significantly improved between start of care and discharge or 60 days. Overall QOL, general health, and three of four QOL domains (physical, psychological, and environmental, but not social domain) were significantly improved at discharge or 60 days.

Conclusion: Home health care nurses should maintain and improve the functional ability of patients, as this could improve the QOL of these patients.

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Introduction

The home health care delivery system in the United States has expanded as the demand for the care of acute/chronic health problems increased, particularly among the growing elderly population (Kirby & Lau, 2010). Medicare-certified home health agencies grew in number from 6,809 in 2001 to 10,422 in 2008 (Dey, Johnson, Pagerowski, Tanamor, & Ward, 2011) and provided care for more than 3 million Americans in 2010 (Centers for Medicare & Medicaid Services [CMS], 2010). Contemporary socio-political and economic forces have also influenced the home health care environment (Dieckmann, 2005). Following the downturn of Medicare home health care by the Balanced Budget Act in 1997, home health care began to recover under the home health prospective payment system (Murkofsky & Alston, 2009). Demand for home care services increased not only because of increasing elderly population, but also because of consumer preference and technological advances that allowed complex care to be delivered at home (Ellenbecker, Porell, Samia, Byleckie, & Milburn, 2008). Home health care services are available to all age groups, but 70.5% of such patients were elderly people aged 65 years or above (Caffrey, Sengupta, Moss, Harris-Kojetin, & Valverde, 2011; National Center for Health Statistics, 2005). In the United States, utilization of home health care services peaked in 1996 with 90.6 individuals per 10,000 of population, but it decreased to 48.7 patients per 10,000 in 2000 (National Center for Health Statistics).

Determining objective outcomes of care became an important issue as home health care visits and expenditures grew (Shaughnessy et al., 1996). Hence, the CMS required home health agencies to submit Outcome and Assessment Information Set (OASIS) data for reimbursement. Thus, the CMS began to report publicly the OASIS outcome data for all home health agencies in the United States (CMS, 2003).

OASIS is a tool that evaluates the outcomes of home health services (Shaughnessy & Crisler, 2005). It is a 79-item instrument developed to provide a standardized collection of outcomes data in the home health care setting (Shaughnessy et al., 2002). Its results can be used for outcome-based quality improvement, prospective...
pay, and public reporting of quality data through the “Home Health Compare” initiative (CMS, 2011). OASIS-based quality performance has been reported by the CMS since 2003; it has shown how well home health agencies assisted their patients in regaining or maintaining their ability to function (CMS, 2011). Each agency’s success in achieving positive outcomes on designated OASIS measures was compared to the agency’s previous performance and to that of other agencies (Keepnews, Capitman, & Rosati, 2004).

Evaluation of OASIS data focuses on agency performance on specific patient outcomes, including changes in a patient’s health status between two or more time points. While OASIS provides basic data on the outcomes of home health services, it lacks a measure of quality of life (QOL) of care recipients. QOL has been used increasingly as an important parameter of health and well-being. QOL is defined as individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns (WHOQOL Group, 1994). In clinical practice and clinical trials, QOL indicators are used to evaluate treatment in terms of human costs and benefits. QOL has also been used to make decisions regarding allocation of health care services (Hadorn, 1991). Contemporary goals of treatment are expected to include reducing the severity of symptoms, improving functional status, and improving general QOL (Fletcher, Hunt, & Bulpitt, 1987). QOL research may help predict the course of disease, the process of recovery, the usefulness of therapeutic interventions, the need for specific services, or prognostic indicators of survival duration (DeVon & Ferrans, 2003; Montazeri, 2009). As the population ages and health care evolves in its emphasis from acute care to chronic care, the assessment of QOL will help our comprehensive understanding of its relationship with patient outcomes of home health care service (Fortinsky & Madigan, 2004). Individuals’ subjective perceptions of physical health, psychological health, social functioning, and environment are called “subjective quality of life” and are independent determinants of wellness and disease burden in patients. There is general agreement that subjective QOL is a multifactor-determined construct (Jung et al., 2012).

Even when medical treatment may appear successful, home care patients may have poor psychosocial functioning, adjustment to illness, or QOL. Hence, inclusion of QOL measures could allow for more comprehensive evaluation of the efficacy of treatment and/or home health care (Buck, Jacoby, Massey, & Ford, 2000). Yet few studies have addressed how home health care influences patients’ QOL.

This research aimed to fill the gap and compared QOL outcomes as well as functional outcomes of patients who received home health care service between start of care and discharge or 60 days, whichever came first. Client outcomes are defined as changes in health status resulting from health care activities or interventions (Urden, 2001). Improved client outcomes often result from the combined effect of personal resources and activities plus assistance from professional providers (Holzemer, 1992). The specific aims of this study were to (a) compare the clinical outcomes of home health care patients between the start of care and discharge or 60 days, whichever came first, (b) compare home health care patients’ QOL between start of care and at 60 days or at discharge and (c) identify the determinants of changes in quality of life in home health care patients.

Methods

Study design

This is a prospective descriptive study using a structured questionnaire.

A convenience sample of 110 patients who received home health care services from a home health care agency was recruited; the agency was affiliated with a hospital in a metropolitan city in the United States. The inclusion criteria were the following: Patients were (a) enrolled in a certified home health care agency, (b) were 45 years old and older, (c) had intact cognitive status and no mental disorder, and (d) had no difficulty in communication in English. The sample size was calculated by G*Power program using alpha at .05, power (1 – β) = .95, and an effect size of .35. The estimated sample size was 70.

Ethical considerations

Institutional review board (protocol no. 2008-0445) approvals were received from the University of Illinois at Chicago and the hospital that had formal affiliation with the home health care agency. Patients who met the inclusion criteria were identified and approached by home health care nurses who were trained for the study. Those who agreed to participate completed a consent form, and arrangements were made for an appointment to complete the questionnaire.

Measurements

Clinical outcomes

Patient clinical outcome was measured at start of care and at discharge or after 60 days of service, whichever came first. Clinical outcomes were assessed by using a total of 14 items from OASIS, which included 8 items in activities of daily living (ADLs) and 6 items in instrumental activities of daily living (IADLs). While the ADL represents health status as well as necessary ability for independent living, IADL reflects the level of instrumental independence. ADL items were grooming, ability to dress upper body, ability to dress lower body, bathing, ability to wash entire body, toileting, transferring, ambulation/locomotion, and feeding or eating. Items for IADL included planning and preparing light meals, transportation, laundry, housekeeping, shopping, and ability to use telephone. Within the OASIS, individual items assess different aspects of functional performance. The individual items have different levels of scoring. For all ADLs and IADLs, a value of 0 indicates complete independence and is the best score possible. According to Scharpf and Madigan (2010), using the corrected Likert approach puts all of the individual ADLs and IADLs on the same scale, ranging from 0 to 1. For ease of interpretation across all items, they were reversely coded (Table 1).

The total clinical outcome score was then computed by summing the individually adjusted items for a range in ADLs from 0 to 8, with 0 indicating total dependence in functional items as a group and 8 indicating complete independence, and in IADLs a range from 0 to 6, with 0 indicating total dependence in all items as a group and 6 indicating complete independence. Higher scores indicated higher clinical outcomes.

To combine the 8 ADL items that were measured with different scales into a single index, each item was recored on a scale of 0–1 and then recoded to reverse the direction of scoring. The same process was applied to the 6 IADL items. Recoding was done to reflect level of independence, rather than dependence; this enhanced ease of interpretation of the results: the magnitude of improvement rather than decline was evaluated (Keepnews et al., 2004). “Improvement” meant improved status of ADL and IADL from start of care to discharge or 60 days, and “decline” and “unchanged” meant, respectively, decreased status or no changes in ADL and IADL between the two time points.
Internal consistency, Cronbach’s coefficient alphas were .86 in ADL and .75 in IADL in the present study. Only one study that reported the criterion-related validity of the scales was found, showing a correlation of .44–.69 in the ADL and .20–.68 in the IADL (Tullai-McGuinness, Madigan, & Fortinsky, 2009).

QOL

The World Health Organization Quality of Life Scale-Brief (WHOQOL-BREF) questionnaire (Bonomi & Patrick, 1997; WHOQOL Group, 1995) was used to measure perceived QOL. It consists of 2 global items (overall QOL and general health) and 24 items in the domains of physical, psychological, social relationship, and environmental. The physical domain covers pain, energy, and medication needs (7 items). The psychological domain explores feelings about the meaning of life, capacity of concentration, physical appearance, and feelings of desperation (6 items). The social relationships domain is concerned with friend support and sexual satisfaction (3 items). The environmental domain covers perceived security in daily life, individual satisfaction about transport, and personal impressions about health services (8 items). The score of each domain is found by multiplying the calculated mean value of the items belonging to the component and thus ranges from 4 to 20 (Skevington, Lotfy, & O’Connell, 2004).

Internal consistency, Cronbach’s alphas were between .66 and .84 when it was developed (WHO, 1998). In the present study, these were between .73 and .91 (91 in total quality of life, .81 in physical domain, .76 in psychological domain, .73 in social relationship domain, .78 in environmental domain). The validity and reliability were tested in the study of Skevington et al. (2004) with a sample size of 11,830 from 23 countries.

General characteristics

General characteristics included items such as age, gender, race/ethnicity, marital status, education, annual income status, current residence, living arrangement, primary caregiver, patient’s disease classification according to the International Classification of Diseases-9 code, payment source, duration of service (from start of care to discharge or 60 days), and number of registered nurse visits.

Data collection

Data were collected using a questionnaire between November 2008 and December 2009. Trained home health care nurses visited...
Table 2 (continued)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Categories</th>
<th>n (%)</th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service duration (day)</td>
<td>≤20</td>
<td>38 (38.0)</td>
<td>30.35 (18.00)</td>
</tr>
<tr>
<td></td>
<td>21–30</td>
<td>25 (25.0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>31–40</td>
<td>15 (15.0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41–50</td>
<td>9 (9.0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51–60</td>
<td>13 (13.0)</td>
<td></td>
</tr>
<tr>
<td>No. of RN visits</td>
<td>≤5</td>
<td>28 (28.0)</td>
<td>8.54 (5.62)</td>
</tr>
<tr>
<td></td>
<td>6–7</td>
<td>29 (29.0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8–9</td>
<td>18 (27.0)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>≥10</td>
<td>25 (25.0)</td>
<td></td>
</tr>
</tbody>
</table>

Note: ICD-9 = international classification of diseases; RN = registered nurse.

Data analysis

Data were analyzed by SPSS version 17.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were used to summarize all data. Paired t test was used to compare data between admission and at discharge or 60 days. McNemar’s test was used to compare percentage of participants reporting good QOL and bad QOL between start of care and discharge or 60 days. Chi-square test was used to compare proportion differences among improvement, decline, and unchanged in ADL and IADL between the two time points. Multiple linear regression was used to identify factors which affected the differences in QOL.

Results

General characteristics of participants

Participant characteristics are shown in Table 2. As can be seen, the mean age of the 100 participants was 69.9 years, and 63% of them were over 65 years old. The sample was predominantly female (63%), White (80%), had at least a high school education (92%), and lived in their own homes or rented residences (83%). Among participants, 33% were married and 29% single; 43% lived alone, and 30% lived with a spouse or significant other. Home health care services were reimbursed by Medicare (33%), private insurance (28%), or both Medicare and private insurance (27%). Primary caregivers were spouses or significant others for 32%. According to the International Classification of Diseases-9 codes, 42% of participants were categorized as “health services for specific procedures and after care”. Home care service was received for 30 days or less by 63%, and the mean frequency of registered nurse visits was 8.5 days, ranging from 3 to 38 days.

Clinical outcomes between the start of care and discharge or 60 days

Clinical outcomes of participants between the start of care and discharge or 60 days, as measured by OASIS items, are presented in Table 3. The total mean score of ADL at the start of care and at discharge or 60 days was 5.93 and 7.14, respectively, showing a significant increase of 1.21 (t = 13.33, p < .001). The total mean score of IADL at the start of care and discharge or 60 days was 2.57 and 3.80, respectively, showing a significant increase of 1.23 (t = 12.38, p < .001).

As measured by the sum of the 8 ADL items, 90% of participants showed improvement in total ADL, 3% showed a decline, and 7% remained unchanged (χ² = 144.74, p < .001). In terms of individual

Table 3 Comparison of ADL and IADL between SOC and Discharge or 60 Days (N = 100)

<table>
<thead>
<tr>
<th>Variables</th>
<th>SOC</th>
<th>Discharge</th>
<th>Change</th>
<th>t</th>
<th>p*</th>
<th>Unit improvement (%)</th>
<th>Unit decline (%)</th>
<th>Unit unchanged (%)</th>
<th>χ²b</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>M (SD)</td>
<td>0.74 (0.18)</td>
<td>0.93 (0.16)</td>
<td>0.19 (0.21)</td>
<td>9.06</td>
<td>&lt;.001</td>
<td>54</td>
<td>2</td>
<td>1</td>
<td>42</td>
<td>47.12</td>
</tr>
<tr>
<td>Grooming</td>
<td>0.70 (0.21)</td>
<td>0.92 (0.18)</td>
<td>0.22 (0.19)</td>
<td>11.33</td>
<td>&lt;.001</td>
<td>58</td>
<td>4</td>
<td>1</td>
<td>37</td>
<td>56.00</td>
</tr>
<tr>
<td>Dress upper body</td>
<td>0.56 (0.28)</td>
<td>0.86 (0.23)</td>
<td>0.30 (0.25)</td>
<td>12.10</td>
<td>&lt;.001</td>
<td>47</td>
<td>21</td>
<td>0</td>
<td>32</td>
<td>12.96</td>
</tr>
<tr>
<td>Dress lower body</td>
<td>0.50 (0.29)</td>
<td>0.74 (0.26)</td>
<td>0.24 (0.27)</td>
<td>8.74</td>
<td>&lt;.001</td>
<td>30</td>
<td>33</td>
<td>0</td>
<td>35</td>
<td>55.94</td>
</tr>
<tr>
<td>Bathing</td>
<td>0.91 (0.15)</td>
<td>0.98 (0.12)</td>
<td>0.07 (0.15)</td>
<td>4.38</td>
<td>&lt;.001</td>
<td>&lt;27</td>
<td>0</td>
<td>0</td>
<td>71</td>
<td>74.78</td>
</tr>
<tr>
<td>Toileting</td>
<td>0.83 (0.10)</td>
<td>0.89 (0.11)</td>
<td>0.06 (0.10)</td>
<td>5.67</td>
<td>&lt;.001</td>
<td>30</td>
<td>0</td>
<td>2</td>
<td>68</td>
<td>65.84</td>
</tr>
<tr>
<td>Transferring</td>
<td>0.81 (0.12)</td>
<td>0.86 (0.10)</td>
<td>0.05 (0.10)</td>
<td>5.22</td>
<td>&lt;.001</td>
<td>24</td>
<td>1</td>
<td>1</td>
<td>74</td>
<td>83.06</td>
</tr>
<tr>
<td>Ambulation</td>
<td>0.88 (0.12)</td>
<td>0.97 (0.10)</td>
<td>0.09 (0.10)</td>
<td>9.00</td>
<td>&lt;.001</td>
<td>45</td>
<td>0</td>
<td>0</td>
<td>55</td>
<td>1.00</td>
</tr>
<tr>
<td>Feeding or eating</td>
<td>0.50 (0.31)</td>
<td>0.71 (0.41)</td>
<td>0.21 (0.31)</td>
<td>13.33</td>
<td>&lt;.001</td>
<td>59</td>
<td>90</td>
<td>1</td>
<td>3%</td>
<td>75</td>
</tr>
<tr>
<td>Total ADL</td>
<td>5.93 (1.11)</td>
<td>7.14 (1.05)</td>
<td>1.21 (0.91)</td>
<td>13.33</td>
<td>&lt;.001</td>
<td>59</td>
<td>6</td>
<td>1</td>
<td>34</td>
<td>61.46</td>
</tr>
<tr>
<td>IADL Plan/prepare light meals</td>
<td>0.50 (0.10)</td>
<td>0.59 (0.19)</td>
<td>0.09 (0.19)</td>
<td>4.50</td>
<td>&lt;.001</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>83</td>
<td>43.56</td>
</tr>
<tr>
<td>Transportation</td>
<td>0.07 (0.17)</td>
<td>0.70 (0.37)</td>
<td>0.24 (0.33)</td>
<td>7.29</td>
<td>&lt;.001</td>
<td>33</td>
<td>8</td>
<td>1</td>
<td>58</td>
<td>51.38</td>
</tr>
<tr>
<td>Laundry</td>
<td>0.27 (0.34)</td>
<td>0.56 (0.37)</td>
<td>0.29 (0.36)</td>
<td>8.23</td>
<td>&lt;.001</td>
<td>16</td>
<td>35</td>
<td>2</td>
<td>47</td>
<td>44.42</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>0.28 (0.20)</td>
<td>0.52 (0.28)</td>
<td>0.24 (0.24)</td>
<td>10.27</td>
<td>&lt;.001</td>
<td>46</td>
<td>13</td>
<td>0</td>
<td>41</td>
<td>3.24 .072</td>
</tr>
<tr>
<td>Shopping</td>
<td>0.96 (0.14)</td>
<td>0.97 (0.12)</td>
<td>0.02 (0.11)</td>
<td>1.69</td>
<td>.095</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>91</td>
<td>150.02 .001</td>
</tr>
<tr>
<td>Total IADL</td>
<td>2.57 (0.88)</td>
<td>3.80 (1.21)</td>
<td>1.23 (0.99)</td>
<td>12.38</td>
<td>&lt;.001</td>
<td>90</td>
<td>1%</td>
<td>9%</td>
<td>145.46</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note: ADL = activities of daily living; IADL = instrumental activities of daily living; SOC = start of care.

a p is calculated by paired t test.
b Exact Chi-square test for equal proportion among improvement, decline, and unchanged.
ADL items, participants showed the most improvement in dressing lower body (68%), followed by bathing (63%) and dressing upper body (62%).

Unit change means the change of score between start of care and discharge. If the score at start of care was 1 and then the score changes to 0 at discharge, that is called 1 unit change. ADL items that showed marked improvement by more than 2 units included bathing (33%) and dressing lower body (21%). On the other hand, 0–2% of participants showed a decline, and 32–74% remained unchanged for these same items. The most unchanged item was ambulation (74%), followed by toileting (71%) and transferring (68%).

As measured by the sum of the 6 IADL items, 90% of participants showed improvement, 1% declined, and 9% remained unchanged ($\gamma^2 = 145.46, p < .001$). When analyzed by individual IADL items, the percentages of improved participants varied from 7% to 65%. Plan/prepare light meals (65%) was the most improved item, followed by toileting (71%) and transferring (68%).

Of participants showed a decline, and 32% of participants at the start of care and 74% at discharge or 60 days. The QOL between the start of care and discharge or 60 days.

Table 4 Comparison of QOL between SOC and Discharge or 60 Days

<table>
<thead>
<tr>
<th>Variables (range)</th>
<th>SOC</th>
<th>Discharge</th>
<th>Change</th>
<th>t</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall QOL (1–5)</td>
<td>3.70 (0.98)</td>
<td>4.06 (0.73)</td>
<td>0.37 (1.04)</td>
<td>3.46</td>
<td>.001</td>
</tr>
<tr>
<td>Good n (%)</td>
<td>60 (60)</td>
<td>85 (85)</td>
<td></td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Not good n (%)</td>
<td>40 (40)</td>
<td>15 (15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General health (1–5)</td>
<td>2.98 (1.04)</td>
<td>3.83 (0.90)</td>
<td>0.85 (1.13)</td>
<td>7.51</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Satisfied n (%)</td>
<td>30 (30)</td>
<td>74 (74)</td>
<td></td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Unsatisfied n (%)</td>
<td>70 (70)</td>
<td>26 (26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical (4–20)</td>
<td>12.09 (2.41)</td>
<td>15.17 (2.31)</td>
<td>3.08 (2.73)</td>
<td>10.58</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Psychological (4–20)</td>
<td>14.80 (2.28)</td>
<td>16.13 (2.19)</td>
<td>1.33 (2.48)</td>
<td>5.18</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Social (4–20)</td>
<td>16.95 (2.62)</td>
<td>17.33 (2.34)</td>
<td>0.38 (2.21)</td>
<td>1.73</td>
<td>.087</td>
</tr>
<tr>
<td>Environmental (4–20)</td>
<td>15.49 (2.01)</td>
<td>16.80 (1.94)</td>
<td>1.31 (1.88)</td>
<td>6.58</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Note. QOL = quality of life; SOC = start of care.
*a p calculated by paired t test.
*b p calculated by McNemar test.

The ADL score included capacity for daily self-care, which is essential for ensuring independent living and contributes importantly to overall QOL (Drewnowski & Evans, 2001). Maintaining daily functions without assistance may be the most salient outcome variable. Seven million Americans aged more than 65 years depend on others for help with some basic tasks of daily living (Ory & Cox, 1994). While the ADL data represent health status as well as necessary ability for independent living, IADL reflects the level of instrumental independence.

In this study, 90% of participants improved in both ADL and IADL. This finding compares favorably with that of Kee news et al. (2004), who reported improvement of both ADL and IADL in 78% of 1,051 home care patients who received home health care for less than 60 days. Hadley, Rabin, Epstein, Stein, and Rimes (2000) examined functional status of patients at the time of discharge.
from the hospital and 6 months later. They reported that functional status of patients who received home health care showed more improvement than that of nonusers of the home care service. Scharpf and Madigan (2010) compared ADL in OASIS of patients with heart failure who received home health care at start of care and at discharge, and found that 86% experienced improved or stayed the same. In that study, each item of ADL improved from 0.03 to 0.17 compared to the improvement from 0.05 to 0.30 in this study. The most improved item was dress lower body followed by bathing, the same finding as in Scharpf and Madigan’s research on functional status outcome measures in home health care patients with heart failure.

Hadley et al. (2000) analyzed the effect of posthospitalization home health care use on the change in functional status for a sample of 2,127 (over 65 years of age) Medicare beneficiaries who participated in Medicare’s Current Beneficiary Survey for 6 months after hospital discharge. Home health care users experienced greater improvement in functional status than nonusers, as measured by the change in a continuous scale based on the number and mix of ADL and IADL before and after hospitalization. The estimated improvement in functional status could be as large as 13% for a 10% increase in home health care use.

From a clinical perspective, it may be advantageous to use the individual ADL change scores, particularly the bathing score because bathing is a complex task, requiring multiple kinds of movements (transfer, use of upper and lower limbs) and may be a proxy representation of how well these patients can manage their self-care (Scharpf & Madigan, 2010).

Studies about the effectiveness of home health care on stabilizing or improving patients’ functional status are limited, and the results were mixed. The conflicting findings may be due, in part, to the numerous chronic health problems experienced by home health care patients. In addition, home health care patients usually experience a downward trajectory of these conditions, requiring home health care goals aimed at slowing the progression of disease and minimizing symptoms rather than improving them.

QOL and functional outcomes

Subjects showed higher scores in most QOL items. Using 12.0 as the scale midpoint where QOL was judged to be neither good nor poor, the means indicated that QOL was above average. Skevington et al. (2004) analyzed QOL assessment as measured by WHOQOL-BREF from a survey of adults performed in 23 countries (n = 11,830). The mean score in the United States for each domain of QOL ranged from 11.7 (social domain) to 15.5 (physical domain).

The mean score of the physical domain at start of care in this study was lower, but the meanscores of other domains were higher compared to those in Skevington et al. (2004). Particularly, mean scores of all domains at discharge or 60 days in this study were higher than start of care. Generally, the higher QOL found in this study might be explained by differences in participants of the two studies, such as health status and income. In our sample, 80% were White, and only 9% got Medicaid service, whereas those in Skevington et al.’s study were sampled from the general population in hospitals, rehabilitation centers, and primary care settings with respect to quotas of important sociodemographic variables.

The results of this study showed that QOL was significantly improved at discharge or 60 days compared to the QOL at start of care. When analyzed by domains, social domain was not significantly improved, and this might be related to considerably high scores of social QOL at start of care. Social domain is not affected by age, marital status, and education in rural areas. On the other hand, the presence of chronic disease and dependency in daily activities and lifestyle affect the social domain. In those with disease and the bedridden, social domain scores were the lowest (Arslantas, Unsal, Metintas, Koc, & Arslantas, 2009). Among ADLs, for the item of ambulation/locomotion which is related to dependence, at start of care, only 1% of participants were “able to walk only with the supervision or assistance of another person at all times,” 65% “[required] use of a device to walk alone,” and 20% were “able to independently walk.” At discharge or 60 days, all were independent except for 2% who were “able to walk only with the supervision or assistance of another person at all times.”

Table 5 Factors Influencing the Relationship of Functional Outcome and QOL between SOC and Discharge or 60 Days

<table>
<thead>
<tr>
<th>Variables</th>
<th>Physical domains</th>
<th>Psychological domains</th>
<th>Social domains</th>
<th>Environmental domains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>βa</td>
<td>βb</td>
<td>t</td>
<td>p</td>
</tr>
<tr>
<td>(Constant)</td>
<td>11.17</td>
<td>-0.02</td>
<td>-0.07</td>
<td>0.047</td>
</tr>
<tr>
<td>Service duration</td>
<td>-0.02</td>
<td>-0.07</td>
<td>0.06</td>
<td>0.553</td>
</tr>
<tr>
<td>Age</td>
<td>0.09</td>
<td>0.02</td>
<td>0.14</td>
<td>0.053</td>
</tr>
<tr>
<td>ADL at SOC</td>
<td>1.24</td>
<td>0.54</td>
<td>0.43</td>
<td>2.84</td>
</tr>
<tr>
<td>ADL change</td>
<td>1.24</td>
<td>0.54</td>
<td>0.43</td>
<td>2.84</td>
</tr>
<tr>
<td>IADL at SOC</td>
<td>1.77</td>
<td>0.15</td>
<td>0.80</td>
<td>0.945</td>
</tr>
<tr>
<td>IADL change</td>
<td>1.77</td>
<td>0.15</td>
<td>0.80</td>
<td>0.945</td>
</tr>
</tbody>
</table>

Adjusted R² = .68
F = 3.66
p = .002

Adjusted R² = .107
F = 2.58
p = .19

Adjusted R² = .083
F = 2.27
p = .035

Adjusted R² = .251
F = 5.22
p < .001

Note: QOL = quality of life; SOC = start of care; RN = registered nurse.

a β is the unstandardized regression coefficient.
b β is the standardized regression coefficient.

Skevington et al. (2000) analyzed the effect of posthospitalization home health care use on the change in functional status for a sample of 2,127 (over 65 years of age) Medicare beneficiaries who participated in Medicare’s Current Beneficiary Survey for 6 months after hospital discharge. Home health care users experienced greater improvement in functional status than nonusers, as measured by the change in a continuous scale based on the number and mix of ADL and IADL before and after hospitalization. The estimated improvement in functional status could be as large as 13% for a 10% increase in home health care use.

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Studies about the effectiveness of home health care on stabilizing or improving patients' functional status are limited, and the results were mixed. The conflicting findings may be due, in part, to the numerous chronic health problems experienced by home health care patients. In addition, home health care patients usually experience a downward trajectory of these conditions, requiring home health care goals aimed at slowing the progression of disease and minimizing symptoms rather than improving them.
timely fashion resulted in a very small sample (n = 17), which was the likely reason for the nonsignificant findings.

Helvik, Engedal, and Selbaek (2010) explored factors that affected QOL using the WHOQOL-BREF in older patients (M = 82.8 years) who were admitted to the hospital. Their QOL was lower in all domains (physical domain at 12.6, environmental domain at 14.9) compared to that of this study. Their findings differed from our study, possibly due to their sample's age and severity of problems, as indicated by their admission to the hospital rather than to the nursing home. The multiple regression models of QOL domains and independent health-related variables were adjusted for each other. Three of four QOL domains (physical, psychological, and environmental, but not the social domain) were associated with ADL. Poor ADL was associated with a poorer QOL because a worse score in the ADL scale is an indicator of worse physical health. Poor physical health is known to influence QOL negatively (Helvik et al.).

When Jeon and Choi (2010) investigated factors that influenced the health-related QOL of young-old men, old-old men, and oldest-old men in vulnerable age who received home care, they found correlations between IADL and health-related QOL of young-old (65–74 yr) (r = .302, p < .05), old-old (75–84 yr) (r = .315, p < .05), and oldest-old (85 or above) (r = .293, p < .05). Also, IADL was one of the predictors in explaining the level of health-related QOL among vulnerable old men (who is Basic Livelihood Security and received home care from public health center).

Tseng and Wang (2001) explored subjectively perceived QOL as measured by the QOL Index—Nursing Home Version and related factors of elderly nursing home residents. ADL (r = .491, p < .05) had a significantly positive relationship with QOL, and ADL was one of the important predictors of QOL. Since the functional dependence level of patients and their ability to execute the ADL are meaningful to their QOL, these will have a direct effect on QOL. The relationships among the three dimensions of QOL need, and health behaviors were examined by Baernholdt, Hinton, Yan, Rose, and Mattos (2011) in a nationally representative sample of adults aged 65 years and older from the National Health and Nutrition Examination Survey (2005–2006). In bivariate analysis, they found that the need variable, ADL function, memory problems, and depression were associated with all three QOL dimensions, including health-related QOL, social functioning, and emotional well-being. However, only ADL was associated with all three dimensions of QOL in their full models, suggesting the importance of ADL to QOL.

ADL and physical environment showed significant relationships with QOL in a study of community-based older adults in Canada (Low & Molzahn, 2007). Level of dependency in ADL and level of help received can affect the overall QOL (Hellstrom, Persson, & Hallberg, 2004).

As early as 1999, the Agency for Healthcare Research and Quality pointed out the importance of focusing on functional outcomes research. The OASIS tool offered an opportunity to incorporate standardized outcome data not previously available to home health care researchers (Keepnews et al., 2004). The CMS, administrator and payer of the Medicare program for aged and disabled Americans, has provided home health care agencies with several types of reports based on the OASIS. Internal agency reports included the number of patients whose conditions improved versus those who declined or stayed the same, at the individual ADL item level. There are also public reports, available on the "Home Health Compare" website. These provide agency-level information on the percentage of patients who improved in specific ADL items. While helpful for targeting specific ADL items, a composite score may also be beneficial in agency quality improvement programs, as it would identify trends in patient populations. For instance, higher levels of functional impairments at discharge from home health care may require addressing clinical care differently during and after home health care (Scharpf & Madigan, 2010).

Nurses recognized the importance of functional status as a patient clinical/health outcome and as an important measure of quality of nursing care over two decades ago (American Nurses Association, 1992). Functional status was often measured by independence in ADLs and IADLs (Roberts, 1999). A meaningful difference in ADL and IADL for home health care would guide policy and practice decisions for nurses as to what level of change is possible and attainable.

Limitations

This study explored the effect of home health care on the clinical outcomes and QOL. The study may have excluded other variables that could contribute to these variables. Future studies are needed to demonstrate the benefits of providing home health care with bigger sample sizes, a comparison group, and more comprehensive measures on QOL. Although ADL and IADL items in OASIS have been widely used at the home healthcare agencies in the United States, little evidence for the validity and relatively low criterion-related validity reported in a previous study (Tullai-McGuinness & Madigan, 2009) might limit the interpretation of the results in this study. Because the endpoint of measurement was defined in two ways (at discharge or 60 days), the time difference from start of care may not be the same for each subject.

Conclusion

Home care services provided by registered nurses using the items of OASIS have shown improved clinical outcomes and QOL after 60 days of home health care. Major improvements in ADL were dressing lower body and bathing and in IADL were preparing light meals, shopping, and housekeeping. ADL and IADL were important predictors of QOL in three of the four QOL domains (physical, psychological, and environmental, but not the social domain). Home health care nurses should focus on improving the functional ability of patients, as they play a key role in making a difference in the lives of these patients who stay at home and receive essential home care.

Conflict of interest

The authors declare no conflict of interest. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Acknowledgments

We thank Pat Koepp and Sharmila Rao for their support, and Suzanne Dunne, LeeAnn Wittenstrom, Conchita Penaranda, and Sun Ok Jang who helped collect data. We acknowledge Dr. Cathy Christenson for her guidance, Ji Sung Lee for statistical consultation, and Kevin Grandfield, Publication Manager for the University of Illinois at Chicago Department of Biobehavioral Health Science, for editorial assistance.

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