

Contents lists available at SciVerse ScienceDirect

Asian Nursing Research

journal homepage: www.asian-nursingresearch.com

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, FAAN³¹ Department of Nursing, Sahmyook University, Seoul, South Korea² College of Nursing, Chonbuk Research Institute of Nursing Science, Chonbuk National University, Jeonju, South Korea³ College of Nursing, University of Illinois at Chicago, Chicago, United States

ARTICLE INFO

Article history:

Received 27 April 2012

Received in revised form

17 November 2012

Accepted 27 February 2013

Keywords:

activities of daily living

home care services

quality of life

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.

Copyright © 2013, Korean Society of Nursing Science. Published by Elsevier. All rights reserved.

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

* Correspondence to: Suk Jung Han, PhD, RN, Department of Nursing, Sahmyook University, Hwarangro-815 Nowon-gu, Seoul 139-742, South Korea.

E-mail address: fountain@syu.ac.kr

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 multi-factor-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.

Setting and samples

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 $(1 - \beta) = .95$, 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 rescored 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.

Table 1 OASIS Measures Used in Functional Status Index

OASIS item	Range	Conversion to ADL 8 and IADL 6 items					
		0	1	2	3	4	5
ADL items							
Grooming	0–3	1	.67	.33	0		
Dress upper body	0–3	1	.67	.33	0		
Dress lower body	0–3	1	.67	.33	0		
Bathing	0–5	1	.80	.60	.40	.20	0
Toileting	0–4	1	.75	.50	.25	0	
Transferring	0–5	1	.80	.60	.40	.20	0
Ambulation	0–5	1	.80	.60	.40	.20	0
Feeding or eating	0–5	1	.80	.60	.40	.20	0
IADL items							
Plan/prepare light meals	0–2	1	.50	0			
Transportation	0–2	1	.50	0			
Laundry	0–2	1	.50	0			
Housekeeping	0–4	1	.75	.50	.25	0	
Shopping	0–3	1	.67	.33	0		
Telephone	0–5	1	.80	.60	.40	.20	0

Note. OASIS = outcome and assessment information set; ADL = activities of daily living; IADL = instrumental activities of daily living.

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 General Characteristics of Participants (N = 100)

Characteristics	Categories	n (%)	M (SD)	
Age (yr)	≤64	37 (37.0)	69.90 (11.92)	
	65–74	26 (26.0)		
	75–84	26 (26.0)		
	≥85	11 (11.0)		
Gender	Male	37 (37.0)		
	Female	63 (63.0)		
Race/ethnicity	White	80 (80.0)		
	Asian	8 (8.0)		
	Black or African American	10 (10.0)		
	Hispanic or Latino	1 (1.0)		
	Native Hawaiian or Pacific Islander	1 (1.0)		
Marital status	Married	33 (33.0)		
	Single	29 (29.0)		
	Widowed	25 (25.0)		
	Divorced	13 (13.0)		
Education	≤5th grade	4 (4.0)		
	Junior high school	4 (4.0)		
	High school	43 (43.0)		
	College	32 (32.0)		
	>College	17 (17.0)		
	Annual income	< \$20,000	40 (40.0)	
	\$20,000–30,000	10 (10.0)		
	\$30,000–40,000	9 (9.0)		
	\$40,000–50,000	9 (9.0)		
	>\$50,000	21 (21.0)		
	Unknown	11 (11.0)		
Current residence	Patient-owned or rented residence	83 (83.0)		
	Family member's residence	14 (14.0)		
	Board & care or assisted living facility	2 (2.0)		
	Others	1 (1.0)		
Living arrangement ^a	Alone	38 (42.7)		
	With spouse or significant other	27 (30.3)		
	With other family member	22 (24.7)		
	With a friend	2 (2.2)		
Payment source	Medicare	33 (33.0)		
	Medicaid	9 (9.0)		
	Private insurance	28 (28.0)		
	Medicare + private insurance	27 (27.0)		
Primary caregiver	Others	3 (3.0)		
	No	21 (21.0)		
	Spouse or significant other	32 (32.0)		
	Daughter or son	27 (27.0)		
	Other family member	13 (13.0)		
	Friend, neighbor, community or church member	3 (3.0)		
	Paid help	4 (4.0)		
ICD-9 code	Health services for specific procedures & after care	42 (42.0)		
	Disease of the respiratory system	14 (14.0)		
	Disease of the circulatory system	13 (13.0)		
	Injury and poisons (e.g., fracture, open wound)	11 (11.0)		
	Disease of the skin	6 (6.0)		
	Symptom, signs and ill-defined condition	6 (6.0)		
	Neoplasms	4 (4.0)		
	Disease of the nervous system	2 (2.0)		

(continued on next page)

Table 2 (continued)

Characteristics	Categories	n (%)	M (SD)
Service duration (day)	≤20	38 (38.0)	30.35 (18.00)
	21–30	25 (25.0)	
	31–40	15 (15.0)	
	41–50	9 (9.0)	
	51–60	13 (13.0)	
No. of RN visits	≤5	28 (28.0)	8.54 (5.62)
	6–7	29 (20.0)	
	8–9	18 (27.0)	
	≥10	25 (25.0)	

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

^a Missing value excluded.

home health care patients and asked if they would be willing to participate in a research project. If they agreed, home health nurses explained about the study purpose and procedure and asked them if they had any questions, and then obtained written consents. Face-to-face interviews followed, using a structured questionnaire that included a demographic profile. The questionnaires were completed by home health nurses based on the interviews. ADL and IADL were measured by home health nurses as a part of OASIS data and QOL was self-reported. Each interview took 30–45 minutes.

Duration of home health care services prescribed by physician in the United States is 60 days. The the order needs to be renewed afterwards. In addition, OASIS data in the healthcare agencies are collected as start of care, and at discharge or 60-day follow up. Therefore the questionnaires were collected at the start of care and at discharge or 60 days, whichever came first.

At the end of each interview, US\$5 was given to patients for their participation. Among the 110 participants, 1 was admitted to a nursing home; 1 passed away; 8 patients did not finish the questionnaire at discharge or 60 days. A total of 100 patients completed in this study.

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 fees 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 ($\chi^2 = 144.74$, $p < .001$). In terms of individual

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

Variables	SOC M (SD)	Discharge M (SD)	Change M (SD)	<i>t</i>	<i>p</i> ^a	Unit change			χ^2 ^b	<i>p</i>		
						Improvement (%)		Decline (%)			Unchanged (%)	
						1 unit	≥2 units					
ADL												
Grooming	0.74 (0.18)	0.93 (0.16)	0.19 (0.21)	9.06	<.001	54	2	1	1	42	47.12	<.001
Dress upper body	0.70 (0.21)	0.92 (0.18)	0.22 (0.19)	11.33	<.001	58	4	1	0	37	56.00	<.001
Dress lower body	0.56 (0.28)	0.86 (0.23)	0.30 (0.25)	12.10	<.001	47	21	0	0	32	12.96	<.001
Bathing	0.50 (0.29)	0.74 (0.26)	0.24 (0.27)	8.74	<.001	30	33	0	2	35	55.94	<.001
Toileting	0.91 (0.15)	0.98 (0.12)	0.07 (0.15)	4.38	<.001	27	1	0	1	71	74.78	<.001
Transferring	0.83 (0.10)	0.89 (0.11)	0.06 (0.10)	5.67	<.001	30	0	2	0	68	65.84	<.001
Ambulation	0.81 (0.12)	0.86 (0.10)	0.05 (0.10)	5.22	<.001	24	1	1	0	74	83.06	<.001
Feeding or eating	0.88 (0.12)	0.97 (0.10)	0.09 (0.10)	9.00	<.001	45	0	0	0	55	1.00	.317
Total ADL	5.93 (1.11)	7.14 (0.92)	1.21 (0.91)	13.33	<.001	90%		3%		7%	144.74	<.001
IADL												
Plan/prepare light meals	0.50 (0.31)	0.86 (0.28)	0.35 (0.30)	11.77	<.001	59	6	1	0	34	61.46	<.001
Transportation	0.50 (0.10)	0.59 (0.19)	0.09 (0.19)	4.50	<.001	17	0	0	0	83	43.56	<.001
Laundry	0.07 (0.17)	0.70 (0.37)	0.24 (0.33)	7.29	<.001	33	8	1	0	58	51.38	<.001
Housekeeping	0.27 (0.34)	0.56 (0.37)	0.29 (0.36)	8.23	<.001	16	35	2	0	47	44.42	<.001
Shopping	0.28 (0.20)	0.52 (0.28)	0.24 (0.24)	10.27	<.001	46	13	0	0	41	3.24	.072
Telephone	0.96 (0.14)	0.97 (0.12)	0.02 (0.11)	1.69	.095	3	4	1	1	91	150.02	<.001
Total IADL	2.57 (0.88)	3.80 (1.21)	1.23 (0.99)	12.38	<.001	90%		1%		9%	145.46	<.001

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 dress lower body (68%), followed by bathing (63%) and dress 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 dress 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 ($\chi^2 = 145.46, p < .001$). 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 shopping (59%) and housekeeping (51%). The most markedly improved item by more than 2 units was housekeeping (35%). On the other hand, 0–2% of participants showed a decline in housekeeping. For each IADL item, 34–91% of participants remained unchanged. The most unchanged item was ability to use telephone (91%), followed by transportation (83%) and laundry (58%).

QOL between the start of care and discharge or 60 days

A comparison of QOL between the start of care and discharge or 60 days is shown in Table 4. Overall QOL was significantly improved at discharge or 60 days compared to that at start of care, showing a mean increase of 0.37 ($t = 3.46, p = .001$). Sixty percent of participants at start of care and 85% at discharge or 60 days reported good QOL, while the difference between the two time points was significant by McNemar's test ($p < .001$). General health at discharge or 60 days was significantly improved compared to that at the start of care, showing a mean increase of 0.85 ($t = 7.51, p < .001$). Thirty percent of participants at the start of care and 74% at discharge or 60 days reported being satisfied with their general health ($p < .001$).

Mean domain scores ranged from 12.09 (physical domain) to 16.95 (social domain) at start of care and from 15.17 (physical domain) to 17.33 (social domain) at discharge or 60 days. The biggest change was in the physical domain ($M = 3.08, SD = 2.73$).

All QOL domains except the social domain were significantly improved at discharge or 60 days compared to the level at the start of care, including physical ($t = 10.58, p < .001$), psychosocial ($t = 5.18, p < .001$), and environmental ($t = 6.58, p < .001$). Specifically, the physical domain, which showed the lowest score at start of care ($M = 12.09, SD = 2.41$), was most improved at discharge

or 60 days ($M = 15.17, SD = 2.31$), whereas the social domain, which showed the highest score at start of care ($M = 16.95, SD = 2.62$), was least improved at discharge or 60 days ($M = 17.23, SD = 2.34$).

Determinants of change in QOL

Multiple linear regressions were used to identify determinants of QOL change, and the results are shown in Table 5. Before using multiple linear regression, QOL change according to general characteristics, ADL, and IADL were tested using *t* test, analysis of variance, or correlation analysis. Only variables statistically significant were included as independent variables for multiple linear regression.

First, correlation between variables, tolerance, and variance inflation factor were tested to identify multicollinearity. The variance inflation factor ranged from 1.201 to 4.007, indicating no multicollinearity. Independent variables included age, service duration, number of registered nurse visits, ADL at start of care, IADL at start of care, ADL change, and IADL change; dependent variables included the four domains of QOL.

When analyzed by domains of QOL, the regression models of the domains physical ($F = 3.66, p = .002$), psychological ($F = 2.58, p = .019$), social ($F = 2.27, p = .035$) and environmental ($F = 5.22, p < .001$) QOL were statistically significant. Physical domain was significantly explained by age, ADL at start of care, and ADL change (adjusted $R^2 = .168, p = .002$). Psychological domain was significantly explained by ADL at start of care, ADL change, IADL at start of care, and IADL change (adjusted $R^2 = .107, p = .019$). Social domain was significantly explained by the number of registered nurse visits only (adjusted $R^2 = .083, p = .035$). Service duration, age, ADL at start of care, ADL change, and IADL change were statistically significantly explained by the change in environmental QOL (adjusted $R^2 = .251, p < .001$).

Discussion

The effects of home health care service on clinical outcomes, including ADL and IADL, and on changes in QOL were examined in 100 home care patients in one U.S. home care agency. Functional status is important because it is necessary for independent living and QOL (Scharpf & Madigan, 2010; Shaughnessy et al., 2002). Most recently, Madigan et al. (2012) reiterated the importance of functional capacity as a key factor in maintaining the ability of older people to live independently and safely at home and as a key focus area for home health care. In this study, both clinical outcomes (in terms of ADL and IADL) and QOL were significantly improved at discharge or 60 days compared with the levels at the start of care.

Clinical outcomes, ADL, and IADL

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 Keepnews 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

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

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

Note. QOL = quality of life; SOC = start of care.

^a *p* calculated by paired *t* test.

^b *p* calculated by McNemar test.

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

Variables	QOL domains															
	Physical				Psychological				Social				Environmental			
	B ^a	β ^b	t	p	B ^a	β ^b	t	p	B ^a	β ^b	t	p	B ^a	β ^b	t	p
(Constant)	11.17		2.02	.047	-6.33		2.12	.037	-3.53		1.35	.182	7.94		3.63	<.001
Service duration	-0.02	-0.07	-0.60	.553	-0.01	-0.08	-0.71	.477	0.01	0.07	0.63	.528	0.03	0.27	2.48	.015
No. of RN visit	-0.04	-0.05	-0.45	.653	0.06	0.14	1.18	.240	-0.10	-0.25	-2.23	.028	-0.04	-0.10	-0.92	.360
Age	0.09	0.22	2.06	.042	0.04	0.20	1.80	.075	0.04	0.19	1.81	.073	0.05	0.32	3.21	.002
ADL at SOC	2.05	0.49	2.53	.013	1.24	0.54	2.84	.006	0.43	0.22	1.13	.262	0.91	0.52	2.92	.005
ADL change	2.16	0.42	2.86	.005	1.21	0.44	2.94	.004	0.51	0.21	1.43	.155	1.28	0.61	4.39	<.001
IADL at SOC	0.77	0.15	0.94	.350	1.17	0.42	2.70	.008	0.40	0.16	1.02	.311	0.46	0.22	1.53	.130
IADL change	1.03	0.22	1.74	.086	0.91	0.34	2.71	.008	0.15	0.07	0.55	.585	0.49	0.27	2.21	.030
	Adjusted R ² = .168				Adjusted R ² = .107				Adjusted R ² = .083				Adjusted R ² = .251			
	F = 3.66				F = 2.58				F = 2.27				F = 5.22			
	p = .002				p = .019				p = .035				p < .001			

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

^a B is the unstandardized regression coefficient.

^b β is the standardized regression coefficient.

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 improvement 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 in this study were "chairfast, unable to ambulate but able to wheel self independently," 14% 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." Although social QOL improved after home health care service, relatively high independence at start of care might have prevented the results from showing a statistically significant improvement.

Naylor et al. (2004) examined the effectiveness of a 3-month Advanced Practice Nurse (APN)-directed discharge planning and home follow-up protocol (transitional care intervention) in elders with heart failure. The intervention group reported greater overall QOL at 12 weeks ($p < .05$), and in the physical dimension at 2 weeks ($p < .01$) and 12 weeks ($p < .05$). However, statistically significant group differences in functional status did not emerge, although less dependency was, on average, observed. Alexy, Benjamin-Coleman, and Brown (2001) did not find any significant changes in QOL between start of care and discharge in studying functional status and QOL of Medicare home health clients at admission to home care and 30 days after admission. Difficulty in collecting both baseline and 30-day post home care admission data on each individual in a

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 older 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.

References

- Alexy, B., Benjamin-Coleman, R., & Brown, S. (2001). Home healthcare and client outcomes. *Home Healthcare Nurse, 19*(4), 233–239. <http://dx.doi.org/10.1097/00004045-200104000-00012>
- American Nurses Association. (1992). *Scope and standards of home health nursing practice*. Silver Spring, MD: Author.

- Arslantas, D., Unsal, A., Metintas, S., Koc, F., & Arslantas, A. (2009). Life quality and daily life activities of elderly people in rural areas, Eskisehir (Turkey). *Archives of Gerontology and Geriatrics*, 48(2), 127–131. <http://dx.doi.org/10.1016/j.archger.2007.11.005>
- Baernholdt, M., Hinton, I., Yan, G., Rose, K., & Mattos, M. (2011). Factors associated with quality of life in older adults in the United States. *Quality of Life Research*, 21(3), 527–534. <http://dx.doi.org/10.1007/s11136-011-9954-z>
- Bonomi, A. E., & Patrick, D. L. (1997). *Users manual and interpretation guide of the United States version of the World Health Organization Quality of Life (WHOQOL) instrument*. Seattle, WA: U.S. WHO Quality of Life Center.
- Buck, D., Jacoby, A., Massey, A., & Ford, G. (2000). Evaluation of measures used to assess quality of life after stroke. *American Heart Association*, 31(8), 2004–2010. <http://dx.doi.org/10.1161/01.STR.31.8.2004>
- Caffrey, C., Sengupta, M., Moss, A., Harris-Kojetin, L., & Valverde, R. (2011). Home health care and discharged hospice care patients: United States, 2000 and 2007. *National Health Statistics Reports*, 38, 1–28.
- Centers for Medicare and Medicaid Services. (2003). *Home health quality initiative overview*. Retrieved from. [http://www.cms.hhs.gov/HomeHealthQualityInitiatives/Downloads/HHQJOverview/pdf](http://www.cms.hhs.gov/HomeHealthQualityInitiatives/Downloads/HHQJOverview.pdf)
- Centers for Medicare and Medicaid Services. (2010). *2010 data compendium*. Retrieved from. https://www.cms.gov/DataCompendium/14_2010_Data_Compendium.asp
- Centers for Medicare and Medicaid Services. (2011). *Home health quality initiatives*. Retrieved from. <http://www.cms.gov/HomeHealthQualityInitiatives/>
- DeVon, H. A., & Ferrans, C. E. (2003). The psychometric properties of four quality of life instruments used in cardiovascular populations. *Journal of Cardiopulmonary Rehabilitation*, 23(2), 122–138.
- Dey, J. G., Johnson, M., Pagerowski, W., Tanamor, M., & Ward, A. (2011). *Home health study report*. Washington, DC: L&M Policy Research. Retrieved from. http://www.lmpolicyresearch.com/sites/default/files/hhpps_literaturereview.pdf
- Dieckmann, J. L. (2005). *Home health administration: an overview. Handbook of home health care administration* (4th ed.). Sudbury, MA: Jones and Bartlett.
- Drewnowski, A., & Evans, W. J. (2001). Nutrition, physical activity, and quality of life in older adults: summary. *Journal of Gerontology*, 56A(Special Issue II), 89–94.
- Ellenbecker, C. H., Porell, F. W., Samia, L., Byleckie, J. J., & Milburn, M. (2008). Predictors of home health nurse retention. *Journal of Nursing Scholarship*, 40(2), 151–160. <http://dx.doi.org/10.1111/j.1547-5069.2008.00220.x>
- Fletcher, A. E., Hunt, B. M., & Bulpitt, C. J. (1987). Evaluation of quality of life in clinical trials of cardiovascular disease. *Journal of Chronic Disease*, 40(6), 557–566. [http://dx.doi.org/10.1016/0021-9681\(87\)90014-2](http://dx.doi.org/10.1016/0021-9681(87)90014-2)
- Fortinsky, R. H., & Madigan, E. A. (2004). Data, information, and quality indicators for home healthcare: rapid implementation, what's next? *Journal for Healthcare Quality*, 26(3), 44–51. <http://dx.doi.org/10.1111/j.1945-1474.2004.tb00495.x>
- Hadley, J., Rabin, D., Epstein, A., Stein, S., & Rimes, C. (2000). Posthospitalization home healthcare use and changes in functional status in a Medicare population. *Medical Care*, 38(5), 494–507.
- Hadorn, D. (1991). The Oregon priority-setting exercise: quality of life and public policy. *Hastings Center Report*, 21(3), 11–16. <http://dx.doi.org/10.2307/3563329>
- Hellstrom, Y., Persson, G., & Hallberg, I. R. (2004). Quality of life and symptoms among older people living at home. *Journal of Advanced Nursing*, 48(6), 584–593. <http://dx.doi.org/10.1111/j.1365-2648.2004.03247.x>
- Helvik, A. S., Engedal, K., & Selbaek, G. (2010). The quality of life and factors associated with it in the medically hospitalized elderly. *Aging & Mental Health*, 14(7), 861–869. <http://dx.doi.org/10.1080/13607861003801003>
- Holzemer, W. I. (1992). Nursing effectiveness research and patient outcomes. A challenge for the second HIV/AIDS decade. *Critical Care Nursing Clinics of North America*, 4(3), 429–435.
- Jeon, E. Y., & Choi, Y. H. (2010). Factors affecting the health-related quality of life according to age in vulnerable aged man. *Journal of Korean Academic Nursing*, 40(3), 400–410. <http://dx.doi.org/10.4040/jkan.2010.40.3.400>
- Jung, Y. E., Seo, H., Song, H. R., Woo, Y. S., Yim, H., Sung, H., et al. (2012). Factors associated with subjective quality of life in Korean patients with depressive disorders: the CRESCEND study. *Quality of Life Research*, 21(6), 967–974. <http://dx.doi.org/10.1007/s11136-011-0006-5>
- Keepnews, D., Capitan, J., & Rosati, R. (2004). Measuring patient-level clinical outcomes of home health care. *Journal of Nursing Scholarship*, 36(1), 79–85. <http://dx.doi.org/10.1111/j.1547-5069.2004.04017.x>
- Kirby, J. B., & Lau, D. T. (2010). Community and individual race/ethnicity and home health care use among elderly persons in the United States. *Health Services Research*, 45(5), 1251–1267. <http://dx.doi.org/10.1111/j.1475-6773.2010.01135.x>
- Low, G., & Molzahn, A. E. (2007). Predictors of quality of life in old age: a cross-validation study. *Research in Nursing & Health*, 30(2), 141–150. <http://dx.doi.org/10.1002/nur.20178>
- Madigan, E. A., Gordon, N., Fortinsky, R. H., Koroukian, S. M., Pina, L., & Riggs, J. S. (2012). Predictors of functional capacity changes in a U.S. population of Medicare home health care patients with heart failure. *Archives of Gerontology & Geriatrics*, 54(3), 300–306. <http://dx.doi.org/10.1016/j.archger.2011.07.018>
- Montazeri, A. (2009). Quality of life data as prognostic indicators of survival in cancer patients: an overview of the literature from 1982 to 2008. *Health and Quality of Life Outcomes*, 7(102), 1–21. <http://dx.doi.org/10.1186/1477-7525-7-102>
- Murkofsky, R. L., & Alston, K. (2009). The past, present, and future of skilled home health agency care. *Clinics in Geriatrics Medicine*, 25(1), 1–17. <http://dx.doi.org/10.1016/j.cger.2008.12.001>
- National Center for Health Statistics. (2005). *Health, United States, 2005, with chartbook on trends in the health of Americans* (pp. 322–323). Retrieved from. <http://www.cdc.gov/nchs/data/hus/05.pdf#094>
- Naylor, M. D., Broton, D., Campbell, R., Maislin, G., McCauley, K. M., & Schwartz, S. (2004). Transitional care of older adults hospitalized with heart failure: a randomized, controlled trial. *Journal of the American Geriatrics Society*, 52(5), 675–684. <http://dx.doi.org/10.1111/j.1532-5415.2004.52202.x>
- Ory, M. G., & Cox, D. M. (1994). Forging ahead: linking health and behavior to improve quality of life in older people. *Social Indicators Research*, 33(1–3), 89–120. <http://dx.doi.org/10.1007/BF01078959>
- Roberts, B. L. (1999). Activities of daily living: factors related to independence. In A. S. Hinshaw (Ed.), *Handbook of clinical nursing research* (pp. 563–578). New York: Sage.
- Scharpf, T. P., & Madigan, E. A. (2010). Functional status outcome measures in home health care patients with heart failure. *Home Health Care Services Quarterly*, 29(4), 155–170. <http://dx.doi.org/10.1080/01621424.2010.534044>
- Shaughnessy, P. W., & Crisler, K. S. (2005). *Effectiveness of a clinical feedback approach to improving patient outcomes: Handbook of home health care administration* (4th ed.). Sudbury, MA: Jones and Bartlett Publishers.
- Shaughnessy, P. W., Hittle, D. F., Crisler, K. S., Powell, M. C., Richard, A. A., Kramer, A. M., et al. (2002). Improving patient outcomes of home health care: findings from two demonstration trials of outcome-based quality improvement. *Journal of the American Geriatrics Society*, 50(8), 1354–1364. <http://dx.doi.org/10.1046/j.1532-5415.2002.50356.x>
- Shaughnessy, P. W., Schlenker, R. E., Crisler, K. S., Arnold, A. G., Powell, M. C., & Beaudry, J. M. (1996). Home care: moving forward with continuous quality improvement. *Journal of Aging Society Policy*, 7(3–4), 149–167. http://dx.doi.org/10.1300/J031v07n03_09
- Skevington, S. M., Lotfy, M., & O'Connell, K. A. (2004). The world health organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. *Quality of Life Research*, 13(2), 299–310. <http://dx.doi.org/10.1023/B:QURE.0000018486.91360.00>
- Tseng, S., & Wang, R. (2001). Quality of life and related factors among elderly nursing home residents in southern Taiwan. *Public Health Nursing*, 18(5), 304–311. <http://dx.doi.org/10.1046/j.1525-1446.2001.00304.x>
- Tullai-McGuinness, S., Madigan, E. A., & Fortinsky, R. H. (2009). Validity testing the outcomes and assessment information set (OASIS). *Home Health Care Services Quarterly*, 28(1), 45–57.
- Urden, L. D. (2001). Outcome evaluation: an essential component for CNS practice. *Clinical Nurse Specialist*, 15(6), 260–268.
- World Health Organization. (1998). *Measuring quality of life: The world health organization quality of life instruments WHOQOL-100 and the WHOQOL-BREF*. Retrieved from. http://www.who.int/mental_health/media/68.pdf
- WHOQOL Group. (1994). Development of the WHOQOL: rationale and current status. *International Journal of Mental Health*, 23(3), 24–56.
- WHOQOL Group. (1995). The World Health Organization Quality of Life assessment (WHOQOL): Position paper from the World Health Organization. Special issue on health-related quality of life: What is it and how should we measure it? *Social Science & Medicine*, 41(10), 1403–1409.