Community nursing services for postdischarge chronically ill patients

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Objective. To examine community nursing services for patients with cardiovascular diseases, chronic respiratory diseases and other general medical conditions, making the transition from hospital to home.

Design. The original study design was a randomised controlled trial. This study is a secondary analysis of the hospital records documented by community nurses for the study-group patients.

Sample. The sample consisted of 46 subjects, randomly drawn from the main study group of the study.

Measurements. The community nursing records were analysed using the Omaha System. Self-reported health status and readmission data were retrieved from the data base of the original study.

Results. The three groups of patients experienced problems across the four domains in the Omaha System. Community nursing interventions did not differ greatly by disease groups. The primary purpose of home visits was observation, followed by treatment and procedures and health teaching. The community nurses in the study spent more effort providing health teaching to the respiratory group than to their counterparts. The outcome measures are self-reported health status and hospital

readmission rates. For self-reported health status, significant differences were observed in the respiratory and cardiovascular group before and after community nursing services. For hospital readmission rate, no significant difference was found.
Conclusions. To improve the well being of chronically ill patients, a comprehensive home intervention programme, emphasising continuous needs of monitoring and case management, is fundamental to producing desired, measurable effects.
Relevance to clinical practice. This paper adds the understanding of home-care services provided by community nurses to chronically ill patients. The scope of nursing services emphasises the significance of a positive, patient-centred, caring and appropriate client–practitioner relationship to improve the self-reported health of patients.

Key words: chronic illness, community nursing, self-reported health

Introduction

Continuity of care is recognised as an essential component in providing continuous holistic support to patients during hospitalisation and after discharge. However, traditional nursing services are often confined to hospitalised patients and discontinued after discharge. Despite the majority of the health problems being settled during hospitalisation, patients may continue to suffer some degree of symptoms on their return home. Community nursing services (CNS) provides nursing care and treatment for patients in their own homes by a group of specially trained, qualified nurses. Community nurses administer nursing care to patients through home visits and educate patients and their families on the subject of health promotion and disease prevention. The ultimate goal of the service is to provide continuous care for patients who are discharged from hospitals and allow them to recover in their home environment.

The practice of CNS has changed significantly over recent years owing to the higher prevalence of chronic illness and the increasing age of the population. Nurses working in the community provide holistic nursing services on illness prevention, health promotion and maintenance and assisting patients towards achieving an optimal quality of life. Currently, community nurses are working on a new role in the health-care enterprises. The services include care manager and personal care providers. Owing to advance in medical technology, nursing treatments at home became more technically demanding as it encompasses a wide range of services, such as self-injection, home parental nutrition and continuous ambulatory peritoneal dialysis (Murashima *et al.* 2002). The community nurses visit the patients to provide specific nursing care according to the individual's need and are responsible for monitoring changes in patients' functional

and psychological status, reinforce health counseling, arrange urgent hospital outpatient appointments and clinical admissions and alter medication regimes after consultation with the physicians. When patients are readmitted, the community nurse provides background information to the attending doctors. The role of care manager is to provide consistency of care, including collaboration with the patients and other health-care providers.

Background

Chronic diseases continue to be an area of concern owing to long life expectancy and advances in medical technology. Patients require long-term rehabilitation and home health care programmes for the prevention of exacerbation and to maintain disease stability after discharge from hospital. Cardiovascular disease is the leading cause of death for both men and women in the USA, accounting for nearly 40% of all annual deaths. The mortality rate is 235·6/100,000 population. In addition, more than 70 million Americans currently live with cardiovascular disease (Centers for disease control and prevention 2006). Chronic obstructive pulmonary disease (COPD) refers to two lung diseases, chronic bronchitis and emphysema. COPD is the fourth leading cause of death in America, claiming the lives of 120,000 Americans in 2002 (American Lung Association 2006). Statistics from the Hong Kong Hospital Authority showed morbidity rates for cardiovascular diseases and chronic lung disease of 3·3/1000 and 7·2/1000, respectively, in 2003 (Hong Kong Hospital Authority 2006). Cardiovascular diseases and chronic lung disease patients face life-long physical, psychological and social problems related to their illness and treatment, causing higher hospitalisation rate compared with other chronic diseases, such as diabetes mellitus or chronic renal failure.

Chronic disease patients experienced a wide variety of difficulties in managing aspects of their own care. Often, older patients expressed the wish to remain in their own homes despite the chronicity of their medical conditions (McKeown 2007). COPD is a major personal and public health burden. The general psychosocial care includes information on the disease and treatment, identifying formal resources for help and enhancing coping skills and self-management (Fraser *et al.* 2006). Luttik *et al.* (2005) investigated the relationships between social support and outcomes in patients with heart failure. Changes in social support significantly predicted changes in rehospitalisations and mortality. The definition of social support can be measured as the perception of the individual on whether they have adequate emotional and instrumental support from the family or formal caregivers. Supporting patients with long-term conditions after discharge from hospital is a significant challenge for health-care professionals. When families could not manage to care for the sick, they turn to people who could provide home nursing care. Community nurses not only participate in curative function, but assist with rehabilitation that address towards achieving an optimal quality of life (Jayasekara 2001). Hudson and Moore (2006) stated that the high-risk older people have complex health and social needs; hence, they require a level of care that is intensive, sustained and time consuming. The care activities included regular monitoring of patients through proactive home visits.

Reducing institutionalisation of patients by focussed home rehabilitation programmes has often been seen as evidence of improved health conditions. Wong *et al.* (2004) revealed that perceived improved health condition is significantly associated with reduced attendance at hospital emergency departments. Perceived health improvement particularly warrants investigation because it reflects patients' own assessment of their health, which may provide a different perception of needs to the health-care providers. Subjective health assessments are valid health status indicators in middle-aged populations and can be used in population health monitoring (Millunpalo *et al.* 1997). Self-rated health is widely used as a measure of health status because of its simplicity and strong relation with outcomes, such as the use of general medical services, mortality and survival (Wilson & Cleary 1995, Van den Brink *et al.* 2005, Perlman 2006). There is also a strong association between physical health and self-reported health (Pinquart 2001, Singh-Manous *et al.* 2006). It is, therefore, believed that subjective, perceived health is an important and useful concept in the assessment of nursing and treatment effectiveness. This study adds to the areas of inquiry in exploring whether community nurse visits have demonstrated effects in patients' self-reported health.

Study purpose

The aim of this study is to examine: (i) the problems experienced by patients with cardiovascular diseases, chronic respiratory diseases and other general medical conditions (chronic diseases, such as diabetes mellitus, renal failure and anaemia) during their transition from hospital to home; (ii) the services provided by community nurses; (iii) the outcomes of the nursing interventions; and (iv) the factors affecting the outcomes following community nurse visits. The original study design was a randomised controlled trial to examine the effects of CNS to chronically ill patients after discharge on hospital readmission. This study is a secondary analysis of hospital records documented by community nurses for the study group patients.

Study design and method

Study sample

The study was designed specifically for patients who were at risk of further readmissions. The original study was a randomised controlled trial of 332 participants who had been readmitted to the medical unit of three regional hospitals. There were 166 subjects in the study and the control group. The study group received CNS upon discharge, whereas the control group received the standard hospital discharge service. The standard hospital discharge services included diet and medication advices by the ward nurses on discharge; the patients did not refer to CNS for home follow-up. According to Wong *et al.*'s study in 2004, the patients achieved significant health improvements in the nurse follow-up group, with the effect size of 0·42. Based on the effect size, 80% power and alpha equals to 0·05; 46 subjects are required to achieve the significant results in the present study. This study sample was obtained from the intervention group patients to analyse the effectiveness of CNS. The records of patients with the aforementioned three medical conditions were separated to ensure equal representation of the major diagnostic classifications. Fifteen to 16 records were randomly selected from each disease group.

Design

Community nursing services are pioneers in providing home health-care services in Hong Kong. Most public hospitals operate a CNS department to provide on-going services for

discharged patients. The community nurses in this study made the first home visit within 48 hours of hospital discharge. The nurses used their professional judgement to define the frequency, intensity and focus of contacts needed to meet the patients' needs. The first home visit consisted of a comprehensive health assessment based on protocols developed by the community nursing centre of the respective hospital for patients with cardiovascular or chronic respiratory diseases. The assessment included physical, psychological, emotional and social perspectives to offer a seamless, complete view of the patient's health-care experiences and to facilitate progress follow-up across time. The patient's condition, including physical signs, emotional symptoms, procedures and treatment prescribed, and complaints were recorded for every home visit.

The secondary analysis of hospital records was performed using the Omaha System (revised version 2005), which was chosen for its reported success and reliability in a variety of clinical settings (Martin *et al.* 1993, Bednarz 1999, Martin 2005). The Omaha System serves not only to identify patient problems but consistently documents the various nursing interventions provided. Moreover, the outcomes are represented systematically to help nurses and patients understand and evaluate their current rating and enable nurses to track changes over time. The system serves the purpose of defining and measuring the quality of nursing care across a variety of practice settings (Barrera *et al.* 2003).

The first component of the Omaha System is the Problem Classification Scheme. This comprises four domains, namely environmental, psychosocial, physiological and health-related behaviours. Within these domains, a total of 42 signs and symptoms are listed to further describe the patient's problems. The intervention scheme analyses the interventions provided to patients in a community-based practice. The interventions are divided into five broad categories: health teaching, guidance and counselling; treatment and procedures; case management; and surveillance. The scheme provides comprehensive, orderly and mutually exclusive classification of common nursing activities. Finally, the problem rating scale for outcomes offers a numeric measurement framework to determine patient progress in relation to specific health problems and interventions (Martin *et al.* 1993, Martin 2005). The content validity index of the problem rating scale ranged from 0·77–0·85, indicating that the ratings effectively reflected the important dimensions of the specific problems in the subscale (Martin *et al.* 1999).

The community nurse records were retrieved from the hospital computer system for content analysis. Each subject's record was analysed independently using the text of interaction between the community nurse and the patient at each home contact. The text was divided into episodes of care addressing the same health condition. The units were then classified using the Omaha Classification System. A master prepared nurse coordinator, overseeing the project was responsible for all the codings. To ensure the reliability of project personnel, the patient records were examined randomly by the investigators. The documentation of clinical data was standardised with the inter-rater reliability, established at a minimum of 0·8 or higher. Discussions on the discrepancies of coding were held between the research team members until agreements were reached.

A single-item indicator with a five-point scale was used to assess self-reported health on a dimension of very good, quite good, neither good nor poor, quite poor and very poor. A higher value is equivalent to a higher rating of health. The measurements were taken before and after the completion of community nurse home visits.

Statistical analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 13·0. For patients' problem identification and nursing intervention, data were entered for a maximum of four home visits for each patient. Demographic data for patients of the three disease groups were compared using chi-square for categorical data and ANOVA for continuous variables. Descriptive statistics were used to count the frequencies of problems in the problem classification scheme and community nurses' interventions. Wilcoxon Signed Rank test was used to identify significant differences before and after intervention for the outcome measures. Kruskal–Wallis test was used to examine the differences in nursing interventions between the three disease groups at the four home visits. Spearman Rho correlation analysis was performed to identify factors independently associated with patients' self-reported health (before CNS visits) prior to multiple regression analysis. Statistical tests used were selected based on the variable type and a determination of whether the assumptions for parametric testing were met. Statistical significance was set at two-tailed with $p \leq 0.05$.

Results

Patients' demographic data

The mean age of the patients was 72·9 years (SD 6·03). The gender distribution was even. For disease groups, 32·6% of the patients had chronic respiratory disease, 34·8% of the patients had cardiac disease and the remaining 32·6% had other diseases. The majority of the patients, 97·8%, were not

in the workforce. Education levels of the patients were low. The majority, 52·1%, had received informal education or was illiterate. Fifty per cent of the patients required four home visits with 8·6% of the patients needing more than five visits by the community nurses (Table 1).

Patient problems identified in the Omaha System Domains

A total of 269 clinical encounters were coded. The documentation showed that all groups of patients experienced problems in each of the four problem domains of the Omaha System. The overall results illustrated that the mean number of problems identified per patient was 5·7 per visit. The number of problems ranged from 2–11 in the first home visit. All four visits were represented with the largest number of problems identified in the physiological domain. The second domain in which frequent problems were identified was the area of health-related behaviour. The psychosocial domain was the third area where patients experienced problems. The

least frequently occurring problems were identified in the environmental domain. The diagnosis or problems identified did not vary greatly by disease group. Patients in the cardiovascular and respiratory disease groups were identified as having the most problems in the physiological domain. On the other hand, patients displaying general symptoms were having most problems in the domain of health-related behaviours from the second home visit onwards (Table 2).

Home nursing interventions

A total of 756 interventions were provided to patients in the four home visits, with an average of 16·0 interventions per patient. The number of interventions per visit ranged from 4–11. During the first home visits, the primary intervention was surveillance (74·4%), followed by treatment and procedures (13·9%) and health teaching (11·6%); no records of case management were taken. During the subsequent home visits, surveillance remained the key intervention.

Table 1 Demographic data of the three groups of patients

Variable	Total $n = 46$ (100%)	Respiratory $n = 15$ (32·6%)	Cardiac $n = 16$ (34·8%)	General medical conditions $n = 15$ (32·6%)	χ^2/ ANOVA p value
Gender					
Male	23 (50·0)	10 (66·7)	6 (37·5)	7 (46·7)	0·26*
Female	23 (50·0)	5 (33·3)	10 (62·5)	8 (53·3)	
Age (years)					
Mean (SD)	72·90 (6·03)	73·50 (6·10)	72·40 (7·44)	73·0 (4·47)	0·89†
Education					
Illiterate	14 (30·4)	4 (26·7)	5 (31·3)	5 (33·3)	0·18*
No formal education	10 (21·7)	2 (13·3)	2 (12·5)	6 (40·0)	
Primary	14 (30·4)	5 (33·3)	5 (31·3)	4 (26·7)	
Secondary	6 (13·0)	2 (13·3)	4 (25·0)	0 (0·0)	
Higher education	2 (4·3)	2 (13·3)	0 (0·0)	0 (0·0)	
Occupation					
Employed	1 (2·2)	0 (0·0)	0 (0·0)	1 (6·7)	0·37*
Retired/unemployed	45 (97·8)	15 (100)	16 (100)	14 (93·7)	
Financial status					
Enough	7 (15·2)	2 (13·35)	3 (18·8)	2 (13·31)	0·13*
Barely enough	27 (58·6)	11 (73·3)	7 (43·8)	9 (60·08)	
Not enough	8 (17·4)	2 (13·3)	2 (12·5)	4 (26·7)	
Extremely not enough	4 (8·7)	0 (0·0)	4 (25·0)	0 (0·0)	
Number of home visits					
One	6 (13·0)	0 (0·0)	4 (25·0)	2 (13·3)	0·29*
Two	8 (17·4)	2 (13·3)	2 (12·5)	4 (26·7)	
Three	5 (10·9)	2 (13·3)	2 (12·5)	1 (6·7)	
Four	23 (50·0)	10 (66·7)	5 (31·3)	8 (53·3)	
Five	2 (4·3)	1 (6·7)	1 (6·3)	0 (0·0)	
Eight	2 (4·3)	0 (0·0)	2 (12·5)	0 (0·0)	

*Pearson χ^2 test.
†ANOVA.

Table 2 Frequencies of problems identified by Omaha System

	Total number (%)	Respiratory number (%)	Cardiovascular number (%)	General Medical conditions number (%)
1st visit				
Environmental	7 (2·9)	2 (2·8)	2 (2·9)	3 (3·0)
Psychosocial	29 (12·0)	4 (5·6)	7 (10·0)	18 (18·0)
Physiological	115 (47·7)	40 (56·3)	35 (50·0)	40 (40·0)
Health-related behaviour	90 (37·7)	25 (35·2)	26 (37·1)	39 (39·0)
2nd visit				
Environmental	5 (3·3)	1 (2·0)	3 (6·4)	1 (1·8)
Psychosocial	7 (4·6)	2 (4·1)	1 (2·1)	4 (7·1)
Physiological	78 (51·3)	28 (57·1)	26 (55·3)	24 (42·9)
Health-related behaviour	62 (40·8)	18 (36·7)	17 (36·2)	27 (48·2)
3rd visit				
Environmental	1 (0·9)	0 (0·0)	0 (0·0)	1 (2·6)
Psychosocial	12 (10·4)	6 (12·2)	1 (3·7)	5 (12·8)
Physiological	59 (51·3)	28 (57·1)	15 (55·6)	16 (41·0)
Health-related behaviour	43 (37·4)	15 (30·6)	11 (40·7)	17 (43·6)
4th visit				
Environmental	1 (1·0)	1 (3·1)	0 (0·0)	0 (0·0)
Psychosocial	8 (8·0)	3 (9·4)	2 (9·1)	3 (6·5)
Physiological	49 (49·0)	17 (53·1)	11 (50·0)	21 (45·7)
Health-related behaviour	42 (42·0)	11 (34·4)	9 (40·9)	22 (47·8)

Table 3 Nursing interventions for the three disease groups in the sample

	Total number (%)	Respiratory number (%)	Cardiovascular number (%)	General Medical conditions number (%)
1st visit				
Health teaching	25 (11·6)	8 (13·2)	7 (10·6)	10 (11·2)
Treatment and Procedures	30 (13·9)	12 (20·0)	8 (12·1)	10 (13·9)
Case management	0 (0)	0 (0)	0 (0)	0 (0)
Surveillance	160 (74·4)	40 (66·7)	51 (77·3)	69 (74·4)
2nd visit				
Health teaching	12 (9·3)	7 (16·7)	3 (7·1)	2 (9·3)
Treatment and Procedures	23 (17·8)	8 (19·0)	7 (16·7)	8 (17·8)
Case management	2 (1·5)	1 (2·4)	1 (2·4)	0 (1·5)
Surveillance	92 (71·3)	26 (61·9)	31 (73·8)	35 (71·3)
3rd visit				
Health teaching	15 (16·4)	6 (17·1)	4 (19·0)	5 (16·4)
Treatment and Procedures	20 (21·9)	7 (20·0)	5 (23·8)	8 (21·9)
Case management	2 (2·2)	1 (2·9)	0 (0)	1 (2·2)
Surveillance	54 (59·3)	21 (60·0)	12 (57·1)	21 (59·3)
4th visit				
Health teaching	8 (9·8)	3 (15·0)	1 (4·5)	4 (9·8)
Treatment and Procedures	12 (14·8)	4 (20·0)	4 (18·2)	4 (14·8)
Case management	1 (1·2)	1 (5·0)	0 (0)	0 (1·2)
Surveillance	60 (74·0)	12 (60·0)	17 (77·3)	31 (74·0)

Nursing interventions did not differ greatly by disease groups. Kruskal–Wallis Tests showed no significant difference in treatment interventions among the three disease groups in the four home visits. However, the community nurses spent more effort in providing health teaching to the respiratory group than their counterparts in the second home visits. Table 3 depicts the details of nursing interventions for the three disease groups in the home visit management. The nurses invested most of their time in the initial assessments of patients' needs and

ongoing monitoring and there was no difference among the groups.

Patients' outcomes after community nursing home visits

The subjective outcome measure for this study is self-reported health status and the objective outcome is hospital readmission rates. The information was retrieved from the original database, which examined the CNS provided to both the treatment and control group. Wilcoxon Signed Rank test was used to compare self-reported health status before and after community nurse visits. For self-reported health status, significant differences were observed in the respiratory and cardiovascular group with $p < 0.05$. Table 4 shows the results of patients' self-reported health before and after community nursing interventions.

For hospital readmission rate, no significant difference was found between this selected group compared with the overall rate and the rate by groups in the main study. The percentage of readmission was 34·1% for the selected group and 35·4% for the whole sample in the main study. The percentage of readmissions in the study group is 34·2%, while the control group is 36·6% in the main study.

Predictors for self-reported health

Bivariate analyses, Spearman's rho correlations were used to test the linear relationships between self-reported health (before CNS visits) with the demographic variables. Significant correlations were found in age, gender, education and financial status at 0·05 level (two-tailed). A stepwise regression procedure was conducted to examine the contribution of the selected demographic variables and self-reported health (with a p-value of 0·05 or less from the univariate analyses). Nominal-level variables, such as gender, were coded using dummy coding (0,1), with 1 indicating male and 0 female (Munro 2005). The stepwise regression model was significant (adjusted $R^2 = 0.25$), with patients' gender, age and financial

Table 4 Self-reported health before and after community nursing services

	Self-reported health		
	Preintervention Mean (SD)	Postintervention Mean (SD)	p value
Respiratory	2·63 (0·75)	2·82 (1·06)	*0·05
Cardiovascular	2·45 (1·15)	3·56 (0·61)	* <0·01
General medical conditions	2·52 (1·03)	2·85 (1·08)	0·06

*Significant at the 0·01 level (two-tailed).

status being the significant predictors accounting for 25% of the variance in the regression analysis ($p < 0.05$). The model of regression analysis is shown in Table 5.

Discussion

This study demonstrates that CNS did not vary across the three patient groups in the four home visits. Most of the interventions for the combined sample were in the surveillance category. The respiratory and cardiovascular group patients reported general improvements in self-reported health.

Patient problems identified by Omaha System

The study results showed that the problems identified in the home visits were mostly in the physiological domain across the three disease groups. The second domain in which frequent problems were identified was the area of health-related behaviour. Our results echoed with Murashima *et al.*'s (2002) finding on contents of care provided by community nurses in Japan. Health assessment, personal hygiene assistance and guidance about treatment for clients and families were the three commonest care provided by home visiting nurse. Van Servellne *et al.* (2006) commented that the management of chronic disease is continuous, unlike acute episode care, it is time limited. A full return to one's highest level of functioning might not be the result. This analysis provides implication for research that contributes to an understanding of the types of problems faced by chronic disease patients and their relationships to quality home nursing care. Chronic disease management is continuous and is vital to refer to patients' problems and adhere to existing treatment regimens in achieving the best possible patient outcomes.

Table 5 Regression analyses for self-reported health and demographic variables

Significant predictors	Regression parameter (Beta)	t-statistics	p-value	Tolerance	VIF
Gender	0·42	2·90	0·003	0·91	1·09
Age	0·35	2·35	0·004	0·87	1·15
Financial status	0·30	3·01	0·026	0·95	1·06
Education	0·11	0·64	0·52	0·67	1·50

Adjusted $R^2 = 0.25$.
VIF, variance inflation factor. The higher the VIF value, the more unstable the regression estimation.

Features of community health nursing

In this study, the community nurses were skilled registered nurses who had received special training in home health care nursing. Currently, these nurses are taking the advanced practice roles in home-based nursing. The advanced practice nurse (APN) effected an improvement in patient outcomes, provided high-quality health-care services while controlling health-care costs. Another feature of the APN is the different scope and wide diversity in practice. APN provide more teaching and counselling and deliver less technical procedures (Naylor *et al.* 2000, Brooten *et al.* 2003, Marek *et al.* 2004). The complex concepts related to community nursing are to facilitate collaboration and communication, assuming that independent, disease-specific assessments are conducted. Other crucial components, including individualised education, outcome monitoring and assisting patients to access to the various areas of the health-care system are the required competencies for community nurses.

Needs assessment and problem identification

Our study showed that the most frequently occurring nursing intervention to chronically ill patients was surveillance. A careful assessment of the patient's needs and adequately arranged aftercare are considered essential in the provision of seamless care within the community nursing home care programme. The community nurses possess a battery of skills to conduct needs or problem assessment exercises to collect information and determine strategic service planning. The nurses used a combination of surveillance and the necessary treatment and procedures to bring about positive health outcomes. Evans and Hendricks (1993) concluded that the success of lower admission rates in hospital was attributed to earlier assessment of needs. The study by Mamon *et al.* (1992) further substantiated that patients with unmet treatment needs were more likely to be experiencing complications three weeks postdischarge and those with unmet activity needs were more likely to be rehospitalised within three months. Some social factors, such as family support and age, are predictors of the likelihood of readmission. The comprehensive home assessment, including psychosocial variables, facilities individualised nursing intervention provided in accordance with the patient's characteristics and postdischarge needs. The community nurses serve as valuable resource persons to provide ongoing problem identification and needs assessment for chronically ill patients in transitional care. The challenge posed to the community nurses is to ensure that the planning process should respect the patients' choice without coercion. Successful outcomes generally occur when there is agreement between nurses' assessments and patients' perception of their own needs (Jackson 1994). It is only through detailed needs assessment and problem identification that the needs of senior citizens with chronic diseases could be addressed and care provided according to their unique perspectives.

Case management in CNS

Our results showed that most of the patients' problems identified by the Omaha System were related to the physiological perspective, indicating that interventions on the physical aspects are the first priority in home care. Among the common problems, medication regimen, health-care supervision, nutrition and social contact were areas demanding vast attention for the older patients suffering chronic diseases. In this group of patients, key interventions include systematic follow-up care and continuous patient education. The expected outcomes in chronic disease rehabilitation are related to significant improvements in physical and psychosocial health, and improving and maintaining quality of life (Hallberg & Kristensson 2004).

Community nurses have the relevant depth and scope of knowledge to undertake their particular roles. For patients with chronic lung diseases, home-based care is usually an extension of existing hospital services, as the aim is to prevent exacerbation (Rafferty & Elborn 2004). Despite the extra cost incurred by the respiratory home care, some local and overseas studies revealed no corresponding improvement in quality of life or psychosocial status compared with standard care (Kwok *et al.* 2004, Rafferty & Elborn 2004). The current study shows different findings, as significant changes have been identified for respiratory and cardiovascular patients in self-reported health. For those patients with moderate-to-severe COPD, a weekly community-based maintenance exercise class, supervised by a physiotherapist, combined with a home exercise programme is considered effective intervention for maintaining improvements following a pulmonary rehabilitation programme (Griffiths *et al.* 2000, Cockram *et al.* 2006). Other programmes, such as interval-based high-intensity inspiratory muscle training (HIMT), have demonstrated clinically meaningful improvements in quality of life and have been well tolerated in patients with COPD (Hill *et al.* 2006). For most chronic respiratory disease patients, optimal nursing treatment does not always provide complete relief of the symptoms: interdisciplinary case management in this situation is deemed most appropriate to target the right treatment to the right patient group. Community nurses should be aware of other community resources or out-reach pulmonary rehabilitation

programmes for improvement of lung function for the patients. For those patients who are unable to attend structured pulmonary rehabilitation programmes, more readily available interventions that enhance patients' self-management of dyspnea and ultimately improve their quality of life across the continuum of their illness, are needed.

The study by Arnold *et al.* (2005) showed that COPD patients scored significantly lower in perceived health competence than patients with chronic heart failure. Despite the nursing interventions being broadly similar for all three groups of patients in this study, the nurses did spend a greater amount of time providing health teaching and guidance to the respiratory patients than their counterparts in the home visits. Other home follow-up services include the adoption of specific interventions referring to patients' disease needs, responding to *ad hoc* environmental changes, developing mutually agreed objectives, enhancing positive health behaviours, preventing social isolation and attending to all dimensions of the problems contributing to the new framework of community-based care. As a result, more and more time is required for non-traditional work related to coordinating, networking, planning and establishing a trust relationship with patients. It is only through continuous empirical research and evaluation that nursing interventions can be tailored to the needs of specific patient groups in transitional care.

Self-reported health and hospital readmission

The present study shows significant improvements in self-reported health for cardiovascular and respiratory group patients after community nursing home visits. The nursing intervention, however, was unable to reduce hospital readmissions. Health outcomes that occur as a result of nursing interventions are a measure of nursing contribution (Pender *et al.* 2001). Hospital readmission is a measure of economic outcome while self-reported health is classified as nursing sensitive outcome. Subjective and objective outcomes depend on each other to differentiate effective nursing practices and a global measure of quality services provided to patients. Subjective measures should also be used in conjunction with objective measurement scales to accurately capture health outcomes, particularly for patients with chronic diseases of a deteriorating nature. Hospital readmission is a complex phenomenon that includes factors related to patients, disease and the health-care system. CNS are undoubtedly able to improve the physical and emotional well being of patients by enhancing their quality of life. For health-care cost savings, however, the interventions can only be considered as minimally effective, owing to the complex array of factors, including severity of illness and patient characteristics (Khan *et al.* 2002).

The effects of personal variables and self-reported health

There is an increasing interest in the measurement of self-reported health status in clinical studies and rehabilitation programmes. The outcomes are subjective and multidimensional, including physical, psychological, social, emotional and spiritual dimensions of health (Kuem *et al.* 2005). The single item measure of self-reported health used in this study has been widely reported to be a predictor of future mortality and morbidity. In our study, close associations were found between the demographic variables and self-reported health. Stepwise multiple regression identified three determinants (age, gender and financial status), explaining 25% of the variance in self-reported health.

For the association between age and self-reported health, it was speculated that the older would suffer greater decline in health status and have fewer resources to cope with their health problems than the young group, thus resulting in poorer self-reported health. The findings of this study, however, refute this hypothesis and resonate with Pinquart (2001), who argued that older adults are better able to adapt their criteria of perceived health to deteriorating objective health, so that the age-associated objective health problems have only limited influence on health perception. This outcome could be explained using other authors' work as well. Older people were more likely to report themselves as complying with treatments and engaging in self-care. With increasing age, adherence to all aspects of the therapeutic regimen improves (Kart & Engler 1994, Leggat *et al.* 1998, Chriss *et al.* 2004). These findings may simply reflect that older patients are more likely to comply with the guidance of health-care specialists to manage their symptoms, resulting in better self-reported health status. Furthermore, there is a close association between the activities of daily living (ADL), participation in life and subjective physical health (Pinquart 2001, Pajalic *et al.* 2006). As older people are willing to engage in self-care, this could further explain the correlation between ADL, self-care and subjective well being. Given these findings, self-reported health gives valuable information for primary intervention as the profile shows the characteristics of the patients who need support. However, a causal relationship between self-reported health and increasing age cannot be determined on the basis of our results, but opens up an important avenue for future studies.

Previous studies of socio-demographic variables contributing to the self-reported health demonstrated that gender difference as a determinant of self-reported health is a minor

factor (Eriksson *et al.* 2001, Singh-Manous *et al.* 2006). In their study of the relationship between gender and self-efficacy, Chriss *et al.* (2004) reported that older men with heart diseases were most successful at self-care. Gender was found to have a major impact on how people managed the disease. Previous research by Lindqvist and Sjoden (1998) showed that women use less effective strategies for handling their illnesses, such as emotive, evasive and palliative coping techniques. Subjective self-reported health works alongside the ability in problem solving and disease control through lifestyle change. Male ratings for coping with the disease were higher than female ratings. The maladaptive coping strategies employed by women may further explain their lower coping efficacy in relation to the various aspects of treatment regimens. The aforementioned arguments substantiate the close associations between participation in life, coping and subjective well being.

Borg *et al.* (2006) illustrated that poor financial resources have a significant impact on older people's life satisfaction. Perceived health status is the best single predictor of life satisfaction for older people (Hilleras *et al.* 2001). Other findings suggest that the neighbourhood socioeconomic environment is associated with self-reported poor health (Malmstrom *et al.* 1999). The literatures conclude that both quality of life and socioeconomic status are valid indicators for self-reported health. Consistent with our expectations, the self-reported health status is closely related to financial inequality, suggesting that socioeconomic status exerts an important influence on perceived health. The direct relationship between the variables indicate that it is important for community nurses to look into each individual patient's socioeconomic status, as the differences in self-reported health status could be related to the financial indicators.

The predictors for self-reported health provide understanding and insights on their potential contributory factors, which may be used by community nurses as empirical and theoretical bases for effective continuity of health care. Despite the variable's potential as a powerful tool to predict morbidity and mortality, it should be used in conjunction with other objective measurement tools or used as a supplementary tool to identify patients at risk.

Conclusion

Previous researches on CNS have mainly focussed on separate aspects, such as nursing roles in relation to health outcomes among older people in general. This study implies a need to pay attention in identifying the problems experienced by old-aged patients with differing diseases during their transition

from hospital to home. Accordingly, further attention must be paid when designing meaningful and specific interventions to shape the needs of frail old people in the community. This study also demonstrates that the new framework of CNS is effective in improving the perceived health status of chronically ill patients suffering from cardiovascular and respiratory diseases. The results of this study show the benefits of health teaching, counselling and case management with discharge planning in enhancing the effectiveness of community nurse interventions in our group of patients. To improve the well being of chronically ill patients, a comprehensive home intervention programme emphasising continuous needs monitoring and case management is fundamental to produce desired measurable effects. It is also important to highlight the assessment of self-reported health and variables predicting self-reported health, as these reinforce the quality of patient care in the management of chronic diseases in CNS.

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Contributions

Study design: FKYW, RPLL; data collection and analysis: TMFC, SKYC, KKPC, LYFC and manuscript preparation: SKYC, FKYW

References

American Lung Association (2006) *Search Lung USA*. Retrieved 15 April 2006 from http://www.lungusa.org/site/apps/s/content.asp?c=dvLUK9O0E&b=34706&ct=67252.

Arnold R, Ranchor A, DeJongste M, Koeter G, Ten Hacken N, Aalbers R & Sanderman R (2005) The relationship between self-efficacy and self-reported physical functioning in chronic obstructive pulmonary disease and chronic heart failure. *Behavioral Medicine* 31, 107–115.

Barrera C, Machanga M, Connolly P & Yoder M (2003) Nursing care makes a difference: application of Omaha System. *Outcomes Management* 7, 181–185.

Bednarz P (1999) The Omaha System: a model for describing school nurse case management. *Journal of School Nursing* 14, 24–29.

Borg C, Hallberg I & Blomqvist K (2006) Life satisfaction among older people (65+) with reduced self-care capacity: the relationship to social, health and financial aspects. *Journal of Clinical Nursing* 15, 607–618.

Brooten D, Youngblut J, Deatrick J, Naylor M & York R (2003) Patient problems, advanced practice nurse interventions, time and contact among five patient groups. *Journal of Nursing Scholarship* 35, 73–79.

Centers for disease control and prevention (2006) *National Center for Health Statistics*. Available at http://www.cdc.gov/nchs/fastats/heart.htm (accessed 15 April 2006).

Chriss P, Sheposh J, Carlson B & Riegel B (2004) Predictors of successful heart failure self-care maintenance in the first three months after hospitalisation. *Heart and Lung* 33, 345–353.

Cockram J, Cecins N & Jenkins S (2006) Maintaining exercise capacity and quality of life following pulmonary rehabilitation. *Respirology* 11, 98–104.

Eriksson I, Unden A & Elofsson S (2001) Self-rated health. Comparisons between three different measures. Results from a population study. *International Journal of Epidemiology* 30, 326–333.

Evans R & Hendricks R (1993) Evaluating hospital discharge planning: a randomised clinical trial. *Medical Care* 31, 358–370.

Fraser D, Kee C & Minick P (2006) Living with chronic obstructive pulmonary disease: insiders' perspectives. *Journal of Advanced Nursing* 55, 550–558.

Griffiths TL, Burr ML & Campbell IA (2000) Results at one year of outpatient multidisciplinary pulmonary rehabilitation: a randomised controlled trial. *Lancet* 355, 362–368.

Hallberg I & Kristensson J (2004) Preventive home care of frail older people: a review of recent case management studies. *Journal of Clinical Nursing* 13, 112–120.

Hill K, Jenkins S, Philippe D, Shepherd K, Cecins N, Green D, Hillman D & Eastwood P (2006) High-intensity inspiratory muscle training improves dyspnoea and health related quality of life in chronic obstructive pulmonary disease. *Australian Journal of Physiotherapy* 52, S16.

Hilleras P, Jorm A, Herlitz A & Winblad B (2001) Life satisfaction among the very old: a survey on a cognitively intact sample aged 90 years and above. *International Journal Aging and Human Development* 52, 71–90.

Hong Kong Hospital Authority (2006) *Population health and statistics*. Available at http://www.ha.org.hk/hesd/nsapi (accessed 12 August 2006).

Hudson AJ & Moore LJ (2006) A new way of caring for older people in the community. *Nursing Standard* 20, 41–47.

Jackson M (1994) Discharge planning: issues and challenges for gerontological nursing. A critique of the literature. *Journal of Advanced Nursing* 19, 492–502.

Jayasekara J (2001) Community nurses: an urgent need. *Nursing & Health Sciences* 3, 101–104.

Kart C & Engler C (1994) Predisposition to self-health care: who does what for themselves and why. *Journal of Gerontology* 49, S301–309.

Khan S, Kazmi W, Abichandani R, Tighiouart H, Pereira B & Kausz A (2002) Health care utilization among patients with chronic kidney disease. *Kidney International* 62, 229–236.

Kuem SH, Sook JL, Eun SP, Young-Joo P & Kang HC (2005) Structural model for quality of life of patients with chronic cardiovascular disease in Korea. *Nursing Research* 54, 85–96.

Kwok T, Lum CM, Chan HS, Ma HM, Lee D & Woo J (2004) A randomised, controlled trial of an intensive community nurse-supported discharge program in preventing hospital readmissions of older patients with chronic lung disease. *American Geriatrics Society* 52, 1240–1246.

Leggat JE, Orzol SM, Hulbert-Shearon TE, Golpher TA, Jones CA, Held PJ & Port FK (1998) Non-compliance in haemodialysis: predictors and survival analysis. *American Journal of Kidney Diseases* 32, 139–145.

Lindqvist R & Sjoden P (1998) Coping strategies and quality of life among patients on continuous ambulatory peritoneal dialysis (CAPD). *Journal of Advanced Nursing* 27, 312–319.

Luttik M, Jaarsma T, Moser D, Sanderman R & van Veldhuisen D (2005) The importance and impact of social support on outcomes in patients with heart failure: an overview of the literature. *Journal of Cardiovascular Nursing* 20, 162–169.

Malmstrom M, Sundquist J & Johansson S (1999) Neighborhood environment and self-reported health status: a multilevel analysis. *American Journal of Public Health Association* 89, 1181–1186.

Mamon J, Steinwachs D, Fahey M, Bone L, Oktay J & Klein L (1992) Impact of hospital discharge planning on meeting patient needs after returning home. *Health Services Research* 27, 155–175.

Marek K, Jenkins M, Stringer M, Brooten D & Alexander G (2004) Classifying perinatal advanced practice data with the Omaha system. *Home Health Care Management & Practice* 16, 214–221.

Martin K (2005) *The Omaha System: A Key to Practice, Documentation and Information Management*, 2nd edn. Elsevier Saunders, St. Louis.

Martin K, Scheet N & Stegman M (1993) Home health clients: characteristics, outcomes of care and nursing interventions. *American Journal of Public Health* 83, 1730–1734.

Martin K, Norris J & Leak G (1999) Psychometric analysis of the problem rating scale for outcomes. *Outcome Management for Nursing Practice* 3, 20–25.

McKeown F (2007) The experiences of older people on discharge from hospital following assessment by the public health nurse. *Journal of Clinical Nursing* 16, 469–476.

Millunpalo S, Vuori I, Oja P, Pasanen M & Urponen H (1997) Self-rated health status as a health measure: the predictive value of self-reported health status on the use of physician services on mortality in the work-age population. *Journal of Clinical Epidemiology* 50, 517–528.

Munro (2005) *Statistical Methods for Health Care Research*, 5th edn. Lippincott, Philadelphia.

Murashima S, Nagata S, Magilvy J, Fukui S & Kayama M (2002) Home care nursing in Japan: a challenge for providing good care at home. *Public Health Nursing* 19, 94–103.

Naylor M, Bowles K & Brooten D (2000) Patient problems and advanced practice nurse interventions during transitional care. *Public Health Nursing* 17, 94–102.

Pajalic Z, Karlsson S & Westergren A (2006) Functioning and subjective health among stroke survivors after discharge from hospital. *Journal of Advanced Nursing* 54, 457–466.

Pender NJ, Murdaugh C & Parsons M (2001) *Health Promotion in Nursing Practice*, 4th edn. Prentice Hall, Upper Saddle River.

Perlman F (2006) Determinants of self rated health and mortality in a Russian population sample. *Journal of Epidemiology and Community Health* 60, A8.

Pinquart M (2001) Correlates of subjective health in older adults: an meta-analysis. *Psychology and Aging* 16, 414–426.

Rafferty S & Elborn S (2004) The role of the respiratory nurse specialist. *Clinical Pulmonary Medicine* 11, 228–236.

Singh-Manous A, Martikainen P, Ferrie J, Zins M, Marmot M & Goldberg M (2006) What does self rated health measure? Results

from the British Whitehall II and French Gazel cohort studies *Journal of Epidemiology and Community Health* **60**, 364–372.

Van den Brink CL, Tijhuis M, Van den Bos G, Giampaoli S, Nissinen A & Kromhout D (2005) The contribution of self-rated health and depressive symptoms to disability severity as a predictor of 10-year mortality in European elderly men. *American Journal of Public Health* **95**, 2029–2034.

Van Servellne G, Fongwa M & Mockus D'Errico E (2006) Continuity of care and quality care outcomes for people experiencing chronic conditions: as literature review. *Nursing and Health Sciences* **8**, 185–195.

Wilson I & Cleary P (1995) Linking clinical variables with health-related quality of life: a conceptual model of patient outcomes. *JAMA* **273**, 59–65.

Wong FKY, Chow SKY, Chang KKP, Lee A & Liu J (2004) Effects of nurse follow-up on emergency room revisits: a randomised controlled trial. *Social Science and Medicine* **59**, 2207–2218.