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Original Article

Exploration on the Status of Home Health Care Cases and Its One-Year Prognosis

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SUMMARY

Background: About 80% of disability cases in Taiwan were taken care of at home, and home-based medical care is an important way to enable severe chronic cases to obtain extended continuous care from the medical team at home.
Purpose: To discuss the status of home health care cases and their one-year prognosis.
Method: A total of 436 patients who received home health care from a medical center in central Taiwan from August 2017 to July 2018 were investigated by retrospective medical records.
Result: The average age of the cases was 79.2 ± 13.7 years old, 59.9% were over 80 years old, 56.0% were women, 78.4% were completely dependent, 42.7% had good understanding ability. One year later, 71.8% of the patients with stable condition, 3.9% improved, 14.9% died, 7.8% were admitted to long-term care institutions or hospitalized. Under adjusted gender and dependence status, those with poor understanding ability the odds of death were 2.6 times that of those with good understanding.
Conclusion: Home health care is one of the important policies for the implementation of continuous care under the health insurance system in Taiwan. The case mortality rate in this study was lower than reported in the literature, and the chance of death in cases with good understanding ability was relatively lower. This showed that home health care had a certain effect, and the evaluation or assessment of cases understanding ability were an important element, which could be used as a reference for nursing staff training and improving the quality of home health care in the future.

1. Introduction

Multiple chronic patients were the most important resource users in the medical care system. As the population aged, patients with chronic diseases and dysfunctions became prevalent, and there was an increasing number of people with long-term care needs due to disability or disease characteristics. According to the data from the Directorate General of Budget, Accounting and Statistics (DGBAS) of Executive Yuan (2010), the per capita medical cost of patients requiring long-term care in Taiwan was 8.6 times that of the entire population.[1] The research of Hempstead, Delia, Cantor, Nguyen & Brenner (2014) also pointed out that this ethnic group was often in intermittent care and inappropriate amount of health care services. If they could not receive proper care and effectively prevent disability, it would cause a significant financial burden on many families and the government.[2]

Taiwan started to apply for "National Health Insurance" since 1995, and hoped to include all citizens in health protection through the self-help and mutual assistance system. At the beginning of the launch of National Health Insurance, home health care was included in medical service project and provided home-based service payment plans. Home health care cases were moderate to severely dependent people (ADLs ≤ 60), and should had clearly care needs, such

as replacement of catheters, health education guidance, etc., mainly focusing on nursing services. Home health care was the continuation of care after patients were discharged from the hospital, and it was also the largest stage for nursing staff to perform their professional independent functions.

Because of its cost-effectiveness, home health care had become a basic health policy in many developed countries.[3] Many studies had found that home health care had positive effects on improving health prognosis, reducing health service utilization, and improving patient satisfaction.[4–7] A Hong Kong study on the use of home health care for discharged patients found that the number of patients' hospital stays was significantly reduced, which not only reduced medical costs, but also reduced the rate of repeated admissions and emergency visits for patients with chronic diseases, increased bed utilization, and significantly shortened the patient's waiting time for hospitalization, improved the satisfaction with the entire medical and health services of community residents.[8]

Vandiver, Anderson, Boston, Bowers, & Hall (2018) examined relevant research from 2006 to 2016 home-based residential services could indeed reduce the medical utilization rate of adults with chronic diseases, including emergency and hospitalization, and could also promote the quality of life of the people. This study believed that home-based service was a very cost-effective care model.[9] Scheerens et al. (2020) studied on the patients with chronic obstructive pulmonary disease also found that home health care interventions could reduce hospitalizations, admission to intensive care

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units, using of specialist clinics, sedative drugs, and deaths in hospitals.[10] Shi et al. (2017) and DeCherrie, Soriano, & Hayashi (2012) had similar findings, they believed that home-based medical care could effectively reduce medical expenses, hospitalization rate, disability rate, and staying in nursing homes.[11,12]

It was about 80% of disability cases in Taiwan are taken care of at home. Home health care is an important way for patients with serious chronic diseases to receive long-term and continuous care from the medical team at home. There were 685 home health care institutions in Taiwan that contracted with the National Health Insurance, which were used by 124,186 people in 2018,[13] with a total cost of 3276 million a year,[14] and the number of users and cost had increased year by year. The home health care objects were mostly elderly, disabled, dependent on others, multiple chronic degenerative diseases, high indwelling of catheters,[15–19] it was relatively more necessary to closely monitor their disease control status and related care progress. From the above literature verification, it could be found that most of the researches focus on the cost-effectiveness of home health care, but the actual prognosis of the care outcomes was less explored, and there was also a lack of correction between cases basic information and other functional assessment and their prognosis. Therefore, the purpose of this study was to understand the care situation of these cases, to examine the prognosis and related effectiveness of home health care, as a reference for future policy and medical resource investment.

2. Method

This study used the retrospective investigation method of medical records. A total of 436 patients of home health care in a medical center in central Taiwan were investigated from August 2017 to July 2018. For the subjects admitted in this study, the researchers reviewed the health status assessment form, physical function assessment form, service demand status and survival record at the time of the visit. Research variables included personal characters, health status, services, and prognosis. The prognostic variables are mainly the overall condition of the case, such as stable condition and continuous care, condition improvement (referring to tube removal and no longer need home care services), and death or admission to long-term care institutions, etc. The data of all 436 cases were completely collected by the researcher through the medical records from the computer information system. The SPSS 22.0 Chi-square test and logistic regression model were used for analysis. This study was approved by the Institutional Review Board Chung Shan Medical University Hospital (CS2-18099).

3. Result

The average age of the cases was 79.2 ± 13.7 years old, with the most people over 80 years old, accounting for 59.9%, 56% were women, 93.3% lived with family members, 4.6% lived only with hired foreign care attendants, 32.8% for low- and middle-low income households. In terms of health status, 78.4% of the cases were completely dependent, 42.7% had a good understanding. 72.5% of the cases needed to be fed through the nasogastric tube. In terms of service demand, the most people needed to replace the nasogastric tube, accounting for 72.3%, followed by those who needed replacement urinary catheters, accounting for 49.8%, and those who needed replacement tracheostomy tube, accounted for 11% (Table 1).

After one year of home health care, after deducting the unknown status of 7 (1.6%) missing cases, the case survival rate was 83.5%, and the cases with stable condition and continuous care ac-

counted for 71.8%, 3.9% improved, 14.9% died, 7.8% were admitted to long-term care institutions or hospitalized (Table 2).

Table 3 presented a difference analysis between the patients' status and survival status. The results showed that the age and understanding ability of the case were significantly related to their survival status, but not related to gender, housing status, economic status, and degree of dependence. Under adjusted gender and dependence status, relative to those over 80 years old, the risk of death was lower for 65–79 years old (odds ratio 0.39, p = 0.010), there was no difference in death risk for persons < 65 years old; those with poor understanding ability were 2.6 times more likely to die than those with a good understanding (odds ratio 2.62, p = 0.014) (Table 4).

Table 1
Personal characters, health status and service needs of patients (N = 436).

Variables	Number	%
Personal characters		
Age (years)		
< 65	49	11.2%
65–79	126	28.9%
≥ 80	261	59.9%
Gender		
Female	244	56.0%
Male	192	44.0%
Living condition		
With families	407	93.3%
Live alone	5	1.1%
Live with relatives or friends	4	0.9%
Others (as employed)	20	4.6%
Low and middle-low income		
No	293	67.2%
Yes	143	32.8%
Health status		
Degree of dependence		
Partial (ADLs score > 0)	94	21.6%
Complete (ADLs score = 0)	342	78.4%
Way of eating		
By mouth	100	22.9%
NG feeding	316	72.5%
Others	20	4.6%
Ability to understand		
Good	186	42.7%
Simple sentences or keywords	104	23.9%
Cannot understand	23	5.3%
Unable to assess	123	28.2%
Service requirements		
Replace of Foley catheter		
No	219	50.2%
Yes	217	49.8%
Replace of NG tube		
No	121	27.8%
Yes	315	72.3%
Replace of tracheal tube		
No	388	89.0%
Yes	48	11.0%

Table 2
State of home health care patients after one year (N = 436).

Variables	Number	%
Stable condition and continuous care	313	71.8
Condition improvement	17	3.9
Death	65	14.9
In a long-term institution	19	4.4
Hospitalized	15	3.4
Others	7	1.6

Table 3
Analysis of the status and survival status of patients.

Variables	One-year survival status		p value
	Survive Number (%)	Death Number (%)	
Personal characters			
Age (years)			**0.009***
< 65	44 (89.8%)	5 (10.2%)	
65–79	116 (92.1%)	10 (7.9%)	
≥ 80	211 (80.8%)	50 (19.2%)	
Gender			0.326
Female	204 (83.6%)	40 (16.4%)	
Male	167 (87.0%)	25 (13.0%)	
Living condition			0.657
With families	345 (84.8%)	62 (15.2%)	
Live alone	5 (100.0%)	0 (0.0%)	
Live with relatives or friends	4 (100.0%)	0 (0.0%)	
Others (as employed)	17 (85.0%)	3 (15.0%)	
Low and middle-low income			0.292
No	253 (86.4%)	40 (13.6%)	
Yes	118 (82.5%)	25 (17.5%)	
Health status			
Degree of dependence			0.101
Partial (ADLs score > 0)	81 (86.4%)	13 (13.7%)	
Complete (ADLs score = 0)	282 (82.5%)	60 (17.5%)	
Way of eating			0.287
By mouth	90 (90.0%)	10 (10.0%)	
NG feeding	264 (83.5%)	52 (16.5%)	
Others	17 (85.0%)	3 (15.0%)	
Ability to understand			**0.004***
Good	170 (91.4%)	16 (8.6%)	
Simple sentences or keywords	72 (69.6%)	32 (30.4%)	
Cannot understand	18 (79.7%)	5 (20.3%)	
Unable to assess	103 (83.7%)	20 (16.3%)	
Service requirements			
Replace of Foley catheter			0.476
No	189 (86.3%)	30 (13.7%)	
Yes	182 (83.9%)	35 (16.1%)	
Replace of NG tube			0.130
No	108 (89.3%)	13 (10.7%)	
Yes	263 (83.5%)	52 (16.5%)	
Replace of tracheal tube			0.175
No	327 (84.3%)	61 (15.7%)	
Yes	44 (91.7%)	4 (8.3%)	

Ps. 1. * p < 0.05.
2. p values were calculated by chis-square test or Fisher's exact test.

4. Discussion and conclusion

The survival rate of the cases in this study was similar to the 86% one-year survival rate of 626 elderly people (65–98 years old) in Swedish public long-term care institutions,[20] but higher than the 202 cases studied by Huang et al., which the one-year survival rate of stroke cases was 38.0%.[21] Also higher than Hsieh (2012) and Li, Ye, Huang, Zhu (2012) studies on home care cases, the survival rate of the studies were 61% and 75.2% respectively.[22,23] Corinna, Geir, Jurate, Benth, & Sverre (2018) reported a survival rate of 76% for nursing home 690 case studies,[24] and Li et al. (2012) also had a 74% study for nursing home cases.[23] Our study showed survival rates were higher than these studies. The rate of being admitted to long-term care institutions or hospitalization in this study was lower than that of Chen, Zhan, Huang, and Huang (2014) study at home medical cases, the research result was 9.8%.[25] It was also lower than Wan (2008) study result of coronary heart disease patients 28.2%,[26] which was even lower than that of Li, Li, Yang, and Li (2018) in-home care or emergency department visit rate of 60.3% within one year.[27] The

Table 4
Predictive factors for the survival of patients in severe home care.

Variables	One-year risk of death		
	odds ratio	95% CI	p value
Age < 65 yrs vs. ≥ 80 yrs	0.56	0.21 1.49	0.244
65–79 yrs vs. ≥ 80 yrs	0.39	0.19 0.80	0.010*
Female vs. male	1.21	0.69 2.10	0.509
Poor understanding vs. good	2.62	1.22 5.61	0.014*
Complete dependence vs. partial dependence	0.85	0.33 2.20	0.738

Ps. 1.* p < 0.05.
2. Using multivariate logistic regression model.

reason for the above differences might be due to the degree of disability or the difference between urban and rural areas of residence in each home health care institution.

On the other hand, the analysis of the difference between the personal characters and survival status of the cases was also different from other studies. A study by Noguera et al. (2007) showed that gender, living status and degree of dependence were related to survival status, and the relative risk of male was 1.67 times that of female, and the relative risk of completely dependent cases were 3.54 times of self-care cases, some dependent cases were 1.63 times of self-care cases.[28] This might be because nearly 80% of the cases in our study were completely dependent, while only 11% cases of Noguera's study were completely dependent. In addition, 33.5% of the subjects in our study had cognitive impairments, which was also higher than the 20% in that study.

The elderly population in Taiwan is increasing rapidly, and long-term care was gradually being valued. Many patients after discharge from the hospital still had a high demand for health care. This study found that nearly 50% of home cases had a need to replace the urinary catheter, and more than 70% of cases had a need to replace the nasogastric tube. From these data, it could be seen that home health care services were not only the best field for nursing staff to show independent and professional functions, but also can effectively maintain the stability of 75% cases' diseases or promote their improvement. In this study, the frequency of being hospitalized or admitted institutions and mortality rates of cases of home health care were lower than the literature. It is obvious that comprehensive home health care could keep the cases at home more effectively. The intervention of the home health care services might be able to detect various symptoms and complications at an early stage, provide appropriate services, health education guidance and treatment, referral treatment and other services according to needs. Through these professional services, we could reduce the worsening or impact of the disease, thereby making its prognosis better.

In this study, when gender and dependence status were adjusted, the death rate of people with poor understanding ability was 2.6 times that of people with good understanding ability. Home health care was a case-centered, family-based care model, therefore, the care participation of the cases played a very important role. Home health care nurses should assess the cases' ability of understanding or communication skills and encourage them to actively cooperate and participate care. In this study, 66.6% of the cases had good understanding or simple communication ability, and were able to work together and participate in their own care, rather than relying on family caregivers' alone, which might also be an important key to better outcomes in home health care.

This study had some limitations. First, because our subjects were all from home health care facility in a single medical center, the number of samples is limited, and the results of the study might not

be suitable for all home health care patients. Second, there were too few variables in the database, such as related economic factors, medication content, nutrition status, and social psychology variables could be included in further research in the future. In the future, we hope to conduct prospective research to compare the service outcomes and cost-effectiveness of home care models of different professional teams.

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