

Full Length Research Paper

Efficacy of digital remote tel-system for stroke patients in Taiwan

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The purpose of this study is to examine the efficacy of digital remote tel-system program on stroke patients in Taiwan. Pre-experimental design with convenience sampling was used in this study. A total of 91 participants were recruited with two questionnaires (demographic and SF-36) used. The results showed the quality of life improved significantly after the digital remote tel-system program. The need of home based care for stroke patients after discharge is reported and a digital remote tel-system program is a potentially effective way to fill the need of the patients.

Key words: Stroke, Taiwan, digital remote tel-system.

INTRODUCTION

In Taiwan, stroke is the most common cause of various disabilities (Lin et al., 2008). Stroke is a very complicated disease and many stroke patients have multiple chronic diseases such as cardiovascular diseases or diabetes. Recovery from stroke is a long term process, thus, the scope of health care services of this population includes not only managing their symptoms but also to maintain the best health status and prevent complications (Lai and Wang, 2008). Nevertheless, stroke management is very challenging. The outcome measure of successful treatment of chronic diseases is changed from physical or functional indicators to quality of life which include not only physical aspects but also mental aspects (Kauhanen et al., 2000).

Digital remote tel-system programs can provide physical indicator monitoring where health care providers can provide consultation efficiently and as needed based on the data collected from this program to potentially improve patient outcome (Lin et al., 2009). A previous

study reported that chronic illness patients were satisfied with this new method of care (Borsis and Harvigesen, 2008).

Thus, this study aims to examine the efficacy of digital remote tel-system program on stroke patients in Taiwan.

METHODS

Pre-experimental design with convenience sampling was used in this study. A total of 91 participants were recruited from September 2010 to January 2011 in a Taiwan hospital. All of the participants were asked to complete the demographic questionnaire at the first meeting and to additionally complete a SF-36 at three different points in time, prior to intervention, one month after intervention and three months after intervention. The inclusion criteria were: (1) diagnosed with stroke within the last three months (2) length of stay more than three days (3) The NIHSS score below 15 (4) have a clear conscience (5) able to communicate, and (6) Above 18 years of age. Institutional Review Board approval at the Ming-Che Hospital was obtained before the study was conducted. All of the

Table 1. Repeated-measure ANOVAs.

Variance	1			2			3			SS	df	MS	F	p	Post-Hosc
	Mean	SD	95% CI	Mean	SD	95% CI	Mean	SD	95% CI						
PCS	46.32	2.48	45.80~46.84	48.08	2.69	47.53~48.64	49.51	2.47	49.00~50.03	2505.80	1	2505.80	224.88	<0.001	3>2 ; 2>1
MCS	44.83	7.14	43.34~46.32	48.19	5.87	46.97~49.41	51.08	4.50	50.14~52.02	2093.61	2	2093.61	30.47	<0.001	3>2 ; 2>1

ps:1:pre-test, 2:post-test1, 3:post-test2; Covariates: age, employee status, marital status, family support, education, stroke type, BI, MRS.

eligible patients were given written consent forms and an explanation of the study content was provided. Two instruments used to collect data are as follows:

1. A demographic questionnaire which includes two sections: (1) patient demographic information: age, gender, education, marital status, employee status, family support and economic status (2) patient medical related information: location of stroke, type of stroke, severity of stroke, comorbidity disease, the National Institute of Health Stroke scale (NIHSS), Barthel Index (BI) and the Modified Rankin Scale (MRS) (Quinn et al., 2007, 2009).
2. Medical Outcomes Short Form 36-Health Survey (SF-36). The SF-36 was used to measure outcomes of the study intervention, which is quality of life. The respondents were asked to fill in the questionnaire based on the past month experience. There are 36 questions divided into eight subscales, which are physical function, role limitation caused by physical problems, role limitation caused by emotional problems; social function, bodily pain, mental health, vitality, energy/fatigue, and general health. The eight subscales were divided into two categories, which are the physical component summary (PCS) and the mental component summary (MCS). The score ranges from 0 - 100 with the higher score indicating a better quality of life. The psychometric properties of the Taiwanese version of SF-36 were confirmed by Tseng et al. (2003).

Regarding one-month digital remote tel-system program (DRTSP), two designated nurses took responsibility for consultations in the call center and the hardware patients will bring home including the portable tele-system and the physiological measurement devices. Patients receive consultation calls twice a week (8 total sessions). The content of consultation was focused on follow up of patients' health related status after discharge, which include physiological measurements such as blood pressure twice a day, daily physical activity, healthy lifestyle, medications

use, disease related health education and arrangement of next appointment. In addition, the participants could use the telephone or internet to contact call centers after discharge when necessary, and these two designated nurses respond and locate related resources.

RESULTS

The data were analyzed using SPSS for Windows, Version 17 software. Demographic data was analyzed by descriptive statistic method such as mean and percentage. A repeat measure ANOVA was used to examine the efficacy of the intervention with PCS and MCS of the quality of life as outcome measure. Pearson correlation and ANOVA were used to identify the demographic factors that are associated with the quality of life. Those factors were put into covariance with a Repeat measure ANOVA.

The majority (73.6%) of the participants were males with an average age of 61.08 years. The mean of NIHSS was 5.89 and 60.4% of patients were considered mildly severe. Mean of Barthel index was 73.40 and MRS was 2.62.

As shown in Table 1, patients achieved better PCS and MCS three month post intervention (mean=49.5±2.47, 51.08±4.50; P<0.001), compared to first month after intervention (mean=48.08±2.69; 48.19±5.87) and prior to intervention (mean=46.32±2.48; 44.83±7.14). Demographic patient information including age,

employee status, marital status, family support, education as well as patient medical information including stroke types, BI, and MRS were put into covariance.

DISCUSSION AND RELEVANCE TO PRACTICE

The results showed the quality of life improved significantly after the digital remote tel-system program was used in stroke patients in Taiwan. This finding was consistent with previous research focusing on remote tel-system intervention. Hordam et al. (2010) reported tel-system patient education is an effective way to improve quality of life in total knee replacement patient after discharge. A pre-experimental design with only one group is considered a limitation for this study, but it still provide valuable information for the clinician to know the importance of utilization of electronic technology in patients who were at home after discharge. An experimental design with a random control trail is recommended in future studies to ensure the efficacy of the program.

The need of home based care for stroke patients after discharge is reported and a digital remote tel-system program is a potentially effective way to fill the need of the patients (Hu, 2007). Hospital managers and clinicians should be aware of the importance of this program in order to perform an appropriate referral and utilize this method to

benefit not only the stroke patients but also their families potentially. In addition, this digital remote tel-system program can be applied to different chronic disease patients in the community who need monitoring of their health condition regularly. There were no conflicts of interests in this study.

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