Original Article

Implication of Mauk Nursing Intervention Model on Coping Strategies of Stroke Survivors

Maryam Shoja; Asghar Dalvandi*; Hamid Reza Khanke; Zeinab Ebrahimpour Mouziraji
University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

Abbas Tafakhori; Payam Sarraf
Tehran University of Medical Sciences,
Iranian Center of Neurological Research Imam Khomeini Hospital, Tehran, Iran.

Roozbeh Kazemi
Stroke Rehabilitation of Tabassom, Tehran, Iran.

Akbar Biglarian
University of Social Welfare and Rehabilitation Sciences, Tehran, Iran.

Kristin L. Mauk
College of Nursing, Valparaiso University, Indiana, USA

Objectives: Stroke is a major event in one's life, and patients will inevitably require the use of coping strategies in order to try to reestablish acceptable life equilibrium. Due to the extensive role that nurses can be active members in the patient's rehabilitation plan, the Mauk model is a model that focuses on stroke patients. For each stage of this model, Mauk has developed appropriate rehabilitation nursing interventions. This study aimed to analyze the effect of implementation of the Mauk nursing rehabilitation model (Agonizing phase, Fantasy phase, Realizing phase) on the coping strategies of stroke patients.

Methods: This study is a quasi-experimental one-group pre-test - post-test study. The interventions are identified and coping strategies for patients based on the Mauk model have been trained. Convenience sampling has been done in Imam Khomeini hospital and Tabassom rehabilitation center in 1392. Data collection instruments included a demographic questionnaire and a coping strategies questionnaire for stroke patients. The educational program was implemented in sessions of 45 minutes. The patients' coping strategies, before and after training, were assessed. Data was statistically analyzed using descriptive and inferential tests in SPSS software 16.

Results: The mean score for coping strategies before intervention was 111.42 ±11.71, and after intervention was 102.14± 12.45 ($P<0.05$). The physical, mental and social dimensions in the coping strategies showed significant differences before and after intervention.

Discussion: Using the rehabilitation program interventions for effectively dealing with stress, changing and unpredictable behavior patterns in chronic patients is an important component of the treatment protocol, and helps deliver an increase in coping strategies for stroke patients.

Keywords: Stroke rehabilitation, Nursing Rehabilitation models, Coping strategies, Mauk Model

Submitted: 17 April 2015
Accepted: 15 May 2015

Introduction

Stroke is a leading cause of disability worldwide and, the second most common cause of death and disability (1). The incidence of strokes per 100,000 per year in Western countries is between 100-300 (2) and in Iran is 33-373 (3). Ischemic type has an incidence of 87% and hemorrhagic type 13% (4). Physical problems include impairments that influence activities of daily living (ADLs) dependence on family members, hemiplegia and hemiparesis, inadequate knowledge, poor socio-economic situations, and inadequate social and financial support (5).

*All correspondences to: Asghar Dalvandi, email: <asghar.dalvandi@gmail.com>

The first few weeks after a stroke have been described by patients as a personal catastrophe. Individuals who have had a stroke must face many changes in their lives. Having a stroke is considered a major life event, one which will inevitably require the use of coping strategies in order to try to reestablish an acceptable life equilibrium (6). Coping strategies refer to cognitive and behavioral efforts to manage disruptive events that hinder the person's ability to adjust (7). Two main dimensions of coping are proposed, problem-focused and emotion-focused coping. Problem-focused coping consists of efforts aimed at altering the problematic situation. Emotional-focused coping consists of efforts aimed at managing emotional responses to stressors (8). Each of these strategies may be productive or non-productive (9). The results showed that stroke patients use both emotional- and problematic-focused coping strategies to reduce barriers and to facilitate optimum conditions (10). Therefore, an awareness of coping strategies used by stroke patients, and related to stressors, is an important part of treatment (11). When using the Mauk Model of Post-stroke Recovery, rehabilitation nurses may recognize that much of the teaching done in acute care hospitals or rehabilitation units is not tailored to stroke survivor's immediate needs. Hence they are less likely to be motivated to learn necessary skills and less likely to retain the information they are taught. Evidence suggests that informational interventions alone are not as effective in meeting the complex needs of stroke caregivers as interventions that combine information with other support services. Therefore this model suggests that nursing teaching would often be better received during the latter phases and physical rehabilitation when a person is ready to learn adaptive skills (12,13).

Due to the extensive role of nurses, they can be active members in the patient's rehabilitation plan. The Mauk model is a model that focuses on stroke patients (2). When patients do not complete the recovery process within a hospital or rehabilitation unit, nurses should advocate for services that will allow them to follow survivors and their families until full recovery. There are several rehabilitation nursing models that are used in the rehabilitation of patients, but they are not justified for stroke patients, in terms of stroke nursing rehabilitation (12). These models include: the Henderson model (definition and nature of nursing, 1966), that pays attention to physical dimensions and considers patient independence in some dimensions; Orem's theory (self-care, 1959) is not defined as a nurse-patient relationship and only pays attention to the physical aspects of patients; and Roper's models (based on the life model, 1995) which is used only for acute illness. In all these theories, there is no specific focus on stroke patients (14). The Mauk model, however, just focuses on stroke patients. This model is a practical theory and is applied clinically. In fact, it is a comprehensive process that assesses patients in all aspects of their physical, psychological and social dimensions. The background of the Mauk model is as follows. In 1999, Easton presented a theory-based descriptive-analytical model for recovery and rehabilitation following a stroke. This model stated that stroke survivors travel through six unique stages: agonizing, fantasizing, realizing, blending, framing and owning (15). Mauk (2004) further built on the earlier theoretical work, suggesting tasks and nursing interventions for each phase of recovery. Stroke patients must first pass the first three stages of the model with the training and support interventions determined by the Mauk Model. Then, during physical rehabilitation, they lead the application of constructive coping strategies to adapt to life after stroke and retraining their life skills (12).

A chronic condition such as a stroke makes it important to develop appropriate coping strategies which are positive and productive. Given the extensive domain and complexity of the effects and complications of a stroke, a review of the comprehensive rehabilitation program is necessary to reduce the impacts of neurological disease (16). Therefore, this study is aimed at evaluating the effect of the implementation of the Mauk nursing rehabilitation model (agonizing, fantasy, and realizing phases) during physical rehabilitation on the coping strategies of stroke patients.

Methods

A quasi-experimental one-group pre-test-post-test was performed in Imam Khomeini hospital and Tabassom rehabilitation center in the city of Tehran in 2013. Convenience sampling was done, and the inclusion criteria were: aged between 55-70 years, able to read, marriage and living with their family, no previous history of stroke or TIA, 6 months to 1 year after the stroke, patient is currently undergoing physical rehabilitation. The study population was stroke patients between 55 and 70 years in Imam Khomeini hospital and Tabassom rehabilitation center in October to November 2013.

The sample size was determined as being 7 patients. Data collection instruments included a demographic questionnaire and a coping strategy questionnaire for stroke patients. The demographic questionnaire included 11 questions (age, sex, marital status, education, lifestyle, and occupation) and some information related to the stroke (duration, number of hospitalizations, symptoms associated with the illness, information source, previous family education, and having a caregiver). In this study, to examine the patients' coping strategies, the Lazarus and Folkman coping strategies questionnaire was used. It has eight subscales. This questionnaire was developed by Jafari in 2010 in order to determine facilitators and barriers in post-stroke life. After determining its validity and reliability, the items are set on 5-point Likert scale, which scores from 5 to 1 (Totally agree 5, agree 4, Partly 3, disagree 2, completely disagree 1).

The validity of the questionnaire was evaluated by Jafari in 2010. To assess face and content validity, the questionnaire was sent to 12 experts, and a validity coefficient was calculated for 19 equal to 1, 9 equal to 0.83 and 7 questions, 0.66. These were obtained, and since all questions achieved an acceptable CVR minimum amount (0.56), there was no need to remove any of the questions. A questionnaire content validity coefficient of 0.86 was obtained. In order to determine the reliability of the questionnaire, a test-retest method was used. Spearman correlation coefficients were calculated for all the questions as being 0.7, and Pearson correlation coefficient above 0.8 was seen in all scales. All domains showed appropriate reliability (Cronbach alpha coefficient over 0.7).

Data was statistically analyzed using descriptive and inferential tests in SPSS Software. In Imam Khomeini and Tabassom rehabilitation center in October and November, patients were selected as research samples based on inclusion criteria, and informed consent was taken. Then the researcher explained the objectives of the study. After that, questionnaires were completed, and phone numbers for the next research meetings were given. Data collection was done by individual interviews to identify the first three stages of the Mauk model. The interview and questionnaire stage lasted about 40 minutes. This study was approved by the Ethics Committee of Medical Sciences Tehran University. The aim of the study was explained and guarantee was given that information collected remains secret, and individual results will not be published. If participants accepted this, the informed consent form was signed.

The educational program was implemented in sessions of 45 minutes of personal training and face-to-face with the patient in the neurology ward and stroke clinic of Imam Khomeini hospital and the Tabassom Rehabilitation Center. In the training meeting, with patients and their families participating, the caregivers in this study played a supporting role. Training sessions included the following: the education of stroke illness process; causes and risk factors; complications and treatment of disease; learning effective coping strategies and identifying risks for patients at home.

Rehabilitation and its importance were explained for patients and families were asked to participate in the rehabilitation program of the patients. They were told about the identification of patients with depression, suicide precautions and the identification of patient-supportive systems (family, friends, and spiritual resources). They were also taught about changing lifestyles and preventing a recurrence of the accident, and educated about fatigue, which is one of the main stages of the disease. Feedback was gathered from patients and their families, emphasizing the significance of the follow-up rehabilitation program. Finally, the questionnaire was completed by the patients. At the end of each session, the training packages were offered to patients.

Results

All the limitations of the study should be considered, and efforts to implement the models (patient education) were performed, there were only a limited number of training sessions and samples entering the study and starting this education. According to the model, these interventions had an impact on results of research in the ongoing physical rehabilitation in these centers. According to the patients, one improvement in the effectiveness of these interventions was that it had been removed from controls that the researcher had assumed. However, this study could be the basis for future studies and beginning to implement nursing theories in particular regarding stroke.

As Tables 1-4 to 4-4 show, in this study the majority of the participants were men, with 71.4% and an average age of 60 years and older. 42.9% of participants had primary education, 42.9% were retired, and 71.4% had an ischemic stroke (table 1).

Table 1. The demographic characteristics of stroke patients hospitalized in Imam Khomeini and Tabassom rehabilitation center in Tehran, 2013.

The Demographic Characteristics		Number	Percentage	Total
Gender	Man	5	71.4	7
	Woman	2	28.6	
Education	Primary	3	42.9	7
	Diploma	2	28.6	
	Associate Degree	1	14.3	
Employment	Primary	1	14.3	7
	Free	1	14.3	
	Unemployed	1	14.3	
	Retired	3	42.9	
	Housekeeper	2	28.6	
Type of stroke	Ischemic	5	71.4	7
	Hemorrhage	2	28.6	

According to table (2), the data analysis related to coping strategies in stroke patients indicates that the mean score of coping strategy in stroke patients before the intervention, was (111.42 ± 11.71) and after intervention was (102.14 ± 12.45). That significant difference is statistically (P=0.043), which represents an increase in the use of coping strategies of stroke patients. Lower scores indicate a more effective rehabilitation program.

Table 2. The descriptive indexes related to resulted data due to pre-test and post- test of coping strategies

Steps	Numbers	Mean	Standard deviation	Average Difference	The standard deviation of the difference	Test criteria	The probability
Pre-test	7	111.42	11.71	9.28	9.62	2.55	0.043
Post-test	7	102.14	12.45				

P<0.05 P= 0.043

According to results of table (3) and (4), for evaluating the effect of the rehabilitation program on the coping strategy domains in stroke patients, a statistical test to compare two paired averages was used. Before the implementation test, the normal distribution assumption of areas of coping strategy in the pre-test and post-test stages were analyzed. The results showed the distribution of variables in coping strategy domains in the pre-test and post-test was normal. Therefore, to compare two paired averages, a T-test was applicable.

According to the table (3) it can be concluded that the score of the coping strategy in physical, psychological and social support domains showed significant differences between subjects in the pre-test and post-test (P<05).

Table 3. Index descriptions related to result from the pre-test and post-test coping strategies

Characteristics	Numbers	Pre-test		Post-test	
		Mean	Standard deviation	Mean	Standard deviation
Physical	7	18.85	2.73	13.28	5.52
Emotional	7	17.28	5.12	14.00	3.60
Social support	7	16.28	1.79	15.14	2.11
Economic	7	12.57	3.95	11.14	2.85
Spiritual	7	13.28	2.62	14.00	2.00
Awareness	7	16.42	4.03	18.28	2.69
Environmental factors	7	16.71	1.49	16.28	2.81

The physical domain was lower than others. Stroke patients' average scores in spiritual and awareness was higher than all domains. Overall, stroke patients' coping strategies which showed the most recovery were the domains of physical, psychological, social, economic and environmental factors.

Table 4. Compare coping strategies subscale scores of the pretest and post test

Characteristics	Test criteria		The probability
Physical	3.94	6	0.008
Emotional	3.23	6	0.018
Social support	2.82	6	0.030
Economic	1.31	6	0.237
Spiritual	-0.757	6	0.478
Awareness	-1.75	6	0.129
Environmental factors	0.43	6	0.682

Discussion

This study found that stroke patient's coping strategy scores decreased after the rehabilitation intervention. Lower scores indicate a more effective rehabilitation program, and could be attributed to the effectiveness of rehabilitation programs on stroke patients' coping strategies. Therefore, it can be expressed that the patient moved from emotion-focused coping strategies before the intervention to problem-focused coping strategies after the intervention.

There are several studies that are aligned or non-aligned with our results. Diabetic patients had a tendency to use avoidance strategies before rehabilitation intervention more than problem solving strategies, for example. It can be concluded that the changes in the results is due to the effect of the rehabilitation program (17). Rochette's study (with the aim of coping with the consequences of the stroke) showed a significant increase in the mean score of coping strategies after intervention in the physical and psychological domains ($p<0.05$). Also, the total score of coping strategies after rehabilitation, compared to before, was increased. Whether or not the level of disability was lower, the psychological domain showed more improvement in the post-test (6).

Seyam et al. (2011) showed significant differences in terms of applying problem-coping style ($P<0.000$) and emotional-coping style ($P<0.001$) with the aim of self-care education through coping style for patients after heart surgery. Problem-coping style increased significantly, whereas emotional-coping style decreased (18). Gift et al. in order to report on the effects of a program of systematic movement on COPD patients, used a case which was grouped around lower productive coping strategies following rehabilitation training (19).

Noorian et al. analyzed the effect of rehabilitation on the life quality of patients suffering from strokes. The results revealed that the mean score of life quality in physical, mental, social performances, and general health domains are aligned with the domains of coping strategies, which improved significantly following rehabilitation measures ($P=0.05$) (20). Ben et al. (2001) obtained results in their study which contrast with the present results. When patients used more problem-focused strategies, it means that they are trying to deal actively with a threatening situation while living under great psychological distress (21). That could be due to differences in start time and their relative understanding of the disease. The results showed that the rehabilitation program had no effect on the awareness and spiritual subscales. This lack of effect on the spiritual subscale could be based on the cultural and religious beliefs of the patients. In terms of the awareness subscale, data gathering perhaps took place more from media and other sources than from expert opinions. Bombardier and colleagues confirmed that emotion-focused coping was positively related to poor psychosocial adjustment and depression after controlling for physician-rated disease severity. Appraising chronic illness as holding one back predicted greater emotion-focused coping responses and poorer adjustment to illness (22). Based on this study's results, rehabilitation programs can have a positive effect on identifying and producing effective coping strategies training.

Conclusion

The rehabilitation intervention started from the acute phase of the disease and continues to the chronic phase. In addition to patients, families and the community should be considered. By directing stroke patients to utilize an appropriate treatment, and providing rehabilitation interventions, it would be cost effective, since it requires no lateral treatments.

Despite all the limitations of the study, proper rehabilitation intervention with coping strategy training could improve stroke patients' mental health. Using behavioral psychological interventions for effectively dealing with the stress, changes and unpredictable behavior patterns of chronic patients is an important component of the treatment protocol, and causes an increase in coping strategies in stroke patients.

Limitations and critique on implication of Mauk Model.

Due to the strengths and uniqueness of the model for stroke patients, whereas a stroke is a process that will involve all aspects of a person's life, this model has more emphasis on the psychological and mental aspects of the illness, which can advance interventions towards counseling and mental health care. According to the model, because these patients had already been undergoing ongoing physical rehabilitation in the two centers, these interventions had an impact on the ongoing results there. However, this also means that the effectiveness of these interventions can be questioned, as they have been removed from the control of the researcher.

The physical condition is only considered in the agonizing phase, while there is a lack of attention to the physical condition in the fantasizing and realizing phases. The lack of emphasis on rehabilitation in three first stages, is consistent with the emphasis model of a team approach. Therefore, to be effective, interventions should make use of the rehabilitation team from first the stage of the disease. Specific interventions for each group of stroke patients should accord with the severity, type and location of injury and comorbidities, but the time needed to cross from the three first stages is not clearly defined.

Acknowledgment

This article is part of a thesis entitled (The effect of implication of the Mauk nursing rehabilitation model on the life skills of stroke patients) in a nursing master's degree in 2013, with the code 500-266. The support of the University of Social Welfare and Rehabilitation Science has been implemented.

The acknowledgement is made of the nursing professors of the University of Social Welfare and Rehabilitation Science; Imam Khomeini Hospital respected authorities and Tabassom stroke rehabilitation center, as well as all the families who helped us in this project.

References

1. Dalvandi A, Heikkilä K, Maddah S, Khankeh H, Ekman S-L. Life experiences after stroke among Iranian stroke survivors. International Nursing Review. 2010;57(2):247-53.
2. Brown R, Whisnant JP, Sicks J, O'Fallon WM, Wiebers DO. Stroke incidence, prevalence, and survival: secular trends in Rochester, Minnesota, through 1989. Stroke; a journal of cerebral circulation. 1996;27(3):373-80.
3. Jafari M, Makarem A, Dalvandi A, Azimian M, Hosseini M. Determination of facilitators and barriers in post stroke life, in Kerman city. Modern Rehabilitation. 2011;5(2):54-62.
4. Dalvandi A, Khankeh HR, Ekman S-L, Maddah SSB, Heikkilä K. Everyday Life Condition in Stroke Survivors and Their Family Caregivers in Iranian Context. International Journal of Community Based Nursing and Midwifery. 2013;1(1):3-15.
5. Dalvandi A. Exploring life after stroke: experiences of stroke survivors, their family caregivers and experts in an Iranian context: Inst för neurobiologi, vårdvetenskap och samhälle/Dept of Neurobiology, Care Sciences and Society; 2011.
6. Rochette A, Desrosiers J. Coping with the consequences of a stroke. International Journal of Rehabilitation Research. 2002;25(1):17-24.
7. De Ridder D, Geenen R, Kuijer R, van Middendorp H. Psychological adjustment to chronic disease. The Lancet. 2008;372(9634):246-55.
8. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: a theoretically based approach. Journal of personality and social psychology. 1989;56(2):267.
9. Ali Pour A, Hashemi T, BabapourKheirodin J, Tousi F. The relationship between coping strategies and happiness of students. Journal of Psychology, Tabriz University. 2010;18(5):86-71.
10. Robinson Smith G, Pizzi ER. Maximizing Stroke Recovery Using Patient Self Care Self-Efficacy. Rehabilitation Nursing. 2003;28(2):48-51.
11. Spirito A, Stark LJ, Gil KM, Tyc VL. Coping with Everyday and Disease-Related Stressors by Chronically III Children and Adolescents. Journal of the American Academy of Child & Adolescent Psychiatry. 1995;34(3):283-90.
12. Mauk KL. Nursing interventions within the Mauk Model of Poststroke Recovery. Rehabilitation Nursing. 2006;31(6):257-64.
13. Lutz BJ, Young ME. Rethinking intervention strategies in stroke family caregiving. Rehabilitation Nursing. 2010;35(4):152-60.
14. cave a. Newest treatment for thalassemia. tehran: rastan; 1995.
15. Endler NS, Kocovski NL, Macrodimitris SD. Coping, efficacy, and perceived control in acute vs chronic illnesses. Personality and Individual Differences. 2001;30(4):617-25.
16. najaran n. Review Daily living skills in schizophrenic patients hospitalized in a psychiatric Center Ibn Sina Mashhad based Kvhlmn scale. tehran: tehran welfare and rehabilitation sience 2003.
17. Coelho R, Amorim I, Prata J. Coping styles and quality of life in patients with non-insulin-dependent diabetes mellitus. Psychosomatics. 2003;44(4):312-8.
18. Seyam S, Hidarnia AR, Tavafian SS. Effect of self-care education in the use of coping strategies in patients after cardiac surgery. 2010;135(29):433-44.
19. Gift AG, Austin DJ. The effects of a program of systematic movement on COPD patients. Rehabilitation Nursing. 1992;17(1):6-10.
20. Noorian k, kazemian a, aslani y, delaram m. The effect of rehabilitation intervention on quality of life in stroke patients. 2005;13(50)L7-22.
21. Ben-Zur H, Gilbar O, Lev S. Coping with breast cancer patient, spouse, and dyad models. Psychosomatic Medicine. 2001;63(1):32-9.
22. Bombardier CH, D'Amico C, Jordan JS. The relationship of appraisal and coping to chronic illness adjustment. Behaviour Research and Therapy. 1990;28(4):297-304.