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Evaluating the Impact of Individualized Health Education and Cognitive Training on Clopidogrel Treatment in Elderly Stroke Patients

Min Ning*[1], Chunmei Zheng*[1], Hui Wu[1], Huiling Zhuang[2], Yuduan Wang[2], Nuannuan Long[2], Ning Bei[2]

[1]*Department of Nursing, Geriatric Hospital of Hainan, Haikou, China*
[2]*Department of Neurology, Geriatric Hospital of Hainan, Haikou, China*

**Min Ning and Chunmei Zheng contributed equally to this work.*

ABSTRACT

Background: This study aimed to evaluate the nursing effect of individualized health education combined with cognitive training on clopidogrel treatment in elderly stroke patients.
Methods: One hundred and twelve elderly stroke patients treated in our neurology department from January to June 2019 were randomly divided into experimental and control groups. The control group received clopidogrel therapy, conventional nursing, rehabilitation exercises, and conventional health education. The experimental group received the same treatment plus individualized health education and cognitive training. The intervention effect was assessed using the Montreal Cognitive Assessment (MoCA), the Health Education Questionnaire, the activity of daily living scale (ADL), and the Nurse Job Satisfaction Questionnaire before intervention, at 4 weeks and at 12 weeks.
Results: After 4 and 12 weeks of intervention, patients in both groups showed improvements in MoCA scores, health education awareness rate, ADL scores, and nurses' job satisfaction compared to baseline. Moreover, the experimental group exhibited higher scores than the control group ($P < .05$), with statistically significant differences ($P < .05$).
Conclusion: Individualized health education combined with cognitive training effectively enhances cognitive function, stroke awareness, health education adherence, and self-care ability in elderly stroke patients receiving clopidogrel treatment, thereby improving their overall quality of life.

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INTRODUCTION

A stroke, often referred to as a "cerebrovascular accident," inflicts significant damage on brain tissue due to sudden disruptions in cerebral blood flow caused by various factors such as vessel narrowing, blockage, or rupture.[1] Its effects are profound, leading to physical disabilities, speech impairments, and sensory deficits. In severe cases, it can result in consciousness disturbances that threaten the lives of affected individuals. In China, stroke stands as the third leading cause of death and the primary cause of disability, with up to 70% of survivors experiencing varying degrees of physical limitations after treatment.[2,3] Recognizing the critical importance of early intervention, there have been concerted efforts to reduce mortality rates and alleviate disability associated with stroke.[4]

Within the pharmacological arsenal used to manage stroke, clopidogrel is a cornerstone therapy for elderly patients, aiming to prevent platelet aggregation and alleviate symptoms to improve their quality of life. However, cognitive impairments commonly accompany stroke in elderly individuals and have historically received insufficient attention.[5-7] While effective treatments, nursing care, and rehabilitative exercises are crucial, interventions involving health education also play a vital role in promoting healthy behaviors after a stroke. Unfortunately, traditional health education methods often fall short, failing to ensure patients fully understand and adhere to recommendations, thus compromising their ability to self-manage and maintain long-term quality of life after discharge.

In response to these challenges, this study adopts a comprehensive approach, combining personalized health education with cognitive training as supplements to

Corresponding author: Ning Bei, e-mail: beiningdnhn@163.com

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standard treatment and care protocols. This integrated strategy has achieved promising results, highlighting the essential role of enhancing cognitive function and providing tailored health education in optimizing recovery after a stroke.

MATERIAL AND METHODS

Study Subjects

From January to June 2019, elderly stroke patients who met the criteria for clopidogrel treatment were selected as study subjects at the Geriatric Hospital of Hainan Hospital. *Inclusion criteria*: (1) Patients were between 60 and 80 years old, regardless of gender; (2) they met the diagnostic criteria for stroke adopted by the 4th National Conference on Cerebrovascular Diseases, confirmed by computed tomography or magnetic resonance imaging examination; (3) stable condition at first onset; (4) no cognitive impairment before onset, Montreal Cognitive Assessment (MoCA) score <26 points after onset, plus 1 point for years of education <12 years; and (5) the patient and family agreed and signed the informed consent form. *Exclusion criteria*: (1) patients with consciousness, visual, and hearing impairments; (2) the patient has a speech and communication impairments; (3) patients with multiple illnesses, serious and complex conditions; (4) patients with mental illness and severe intellectual impairment; (5) patients who are unable to actively cooperate; and (6) allergies. *Rejection criteria:* (1) Patients whose condition has worsened and who are unable to tolerate the intervention and (2) patients who dropped out, lost to follow-up, or died. This study randomly selected 112 subjects and divided them into an experimental group (56 cases) and a control group (56 cases). The patients in both groups were aged between 60 and 80 years old, with a mean age of (68 ± 4) years; among them, 67 males and 45 females; 91 had cerebral infarction, and 11 had a cerebral haemorrhage. The general data of the patients in both groups were comparable in terms of gender, age, disease, and education, and they possessed no significant statistical differences (P > .05) (Table 1). In this study, elderly stroke patients who met the criteria for clopidogrel treatment were selected as 112 study subjects at the Cadre Sanatorium (Hainan Provincial Geriatric Hospital). The study was approved by the Ethics Committee of Geriatric Hospital of Hainan (Approval Number: EC201901035).

Intervention Methods

Both groups of elderly stroke patients were given clopidogrel treatment, nursing care, and rehabilitation exercise measures after admission. During clopidogrel treatment, the patients were given 75 mg of clopidogrel orally once per day. The control group implemented conventional health education on this basis, while the experimental group implemented cognitive training and individualized health education combined with health education content. The specific implementation was as follows:

Table 1. Comparison of General Information Between Both Groups [Cases (%)]

Projects	Experimental Group	Control Group	X^2	P
Gender				
Male	36 (64.3)	33 (58.9)	0.340	.560
Female	20 (35.7)	23 (41.1)		
Age				
60-70 years	38 (73.2)	42 (75.0)	0.700	.403
71-80 years	18 (16.8)	14 (25.0)		
Academic qualifications				
Primary school and below	12 (21.4)	15 (26.8)	0.955	.620
Secondary schools	27 (48.2)	22 (39.3)		
University	17 (30.4)	19 (33.9)		
Diseases				
Cerebral infarction	44 (78.6)	41 (73.2)	0.439	.508
Cerebral hemorrhage	12 (21.4)	15 (26.8)		

Preparation Phase: The department set up a research team consisting of 2 rehabilitation physicians, 2 rehabilitation therapists, and 2 rehabilitation specialist nurses. The research team established individualized health education implementation strategies and cognitive training programs, and developed items, pictures, and materials required for cognitive training based on an extensive literature review. After screening, 20 verbs, 100 nouns, 20 phrases, 10 numbers, 100 questions on addition and subtraction within 100, 32 sentence paragraphs, and 10 mnemonics were identified as cognitive pictures that incorporate knowledge of stroke health education. To ensure the accurate implementation of individualized health education and cognitive training, the study team members received homogeneous training before the intervention.

Implementation of Individualized Health Education: (1) On admission, healthcare staff thoroughly assessed the patient through face-to-face conversation, physical examination, and reading of medical records to confirm the patient's problems and formulate a targeted, individualized health education program. (2) Patients are given daily health education according to the contents of their individualized health education program. The content of health education includes hospital environment and layout, admission instructions, the doctor in charge and responsible nurse, disease etiology, pathogenesis and treatment measures, examination and test results and precautions, diet, medication, main nursing measures, functional exercises, psychology, etc. (3) Conduct daily evaluation of patients' educational knowledge and mastery of implementation by the individualized health education program, and adjust the program in real time according to

the evaluation results to ensure the effectiveness of the implementation of the health program. (4) Pay attention to assessing patients' psychological status and social support, strengthen patients' psychological guidance, encourage patients and their families to participate together, and increase patients' confidence in recovering from the disease.

Cognitive Function Training Implementation: Health education content was integrated into the cognitive training process to reinforce the memory of health education knowledge based on neurological remodeling. Cognitive training was carried out by the rehabilitation therapist in the study group. It included: (1) memory training: pictures of people, places, everyday objects, activities of daily living, and stroke health education (data, phrases, sentences, and recipes) were selected and repeatedly explained to the patient, who was asked to repeat and remember the content, and to recall it immediately and again after 5 minutes; (2) attention training: read the numbers and have the patient hear the specific number tapping on the table; read the 8-12 digit numbers to the patient according to a pattern, and have the patient pay attention, listen carefully, and then repeat; read the stroke health education mnemonic to the patient and have the patient repeat it. (3) Numeracy training: ask patients questions about addition and subtraction within 100 and ask them to think about the calculation; simulate supermarket shopping and perform buying and selling operations. (4) Execution training: give patients specific instructions and train them to execute them. Patients are given demonstrations on the positioning of good limbs in bed, bed grooming, feeding, turning, and transferring to a wheelchair in bed, and are instructed to practice repeatedly. (5) Logical thinking skills and language training: give the patient a picture showing time, place, and people, and encourage the patient to express the contents of the picture in words. (6) Sensory impairment training: the operator can place the patient's required supplies in a position where the affected limb can be readily accessed and encourage them to access them by themselves. Stand on the patient's affected side when communicating with them in order to draw the patient's attention and perception to the affected side and prevent deviation from the body from neglect. Training schedule: 2 times a day, 30 minutes each time.

Evaluation Methods

Members of the study team assessed the patients' cognitive function and self-care ability for daily living before intervention, at the end of 4 weeks of intervention, and at the end of 12 weeks of intervention, and assessed the patients' awareness of health education and nurses' job satisfaction during this period, respectively. (1) Patients' cognitive function was assessed using MoCA, with a total score of 30 and a score below 26 indicating cognitive impairment. Add 1 point to the test result for patients with less than 12 years of education. It mainly includes 11 items in 8 cognitive domains, including attention and concentration, executive function, memory, language, visual structure skills, abstract thinking, calculation, and orientation. (2) Patients' self-care ability was scored using the activity of daily living scale (ADL). This 14-item scale includes the physical self-care scale (including dressing, eating, grooming, toileting, walking, and bathing) and the instrumental self-care scale (meal preparation, housework, medication taking, laundry, telephone, shopping, using transport, and economic self-care), mainly comparing the improvement of self-care ability of both groups before and after intervention. Each item was scored on a scale of 1-4 according to the difficulty of completion, with the higher the score, indicating greater difficulty and a poorer ability to take care of oneself. (3) Health education awareness rate and nurse satisfaction survey were assessed using the hospital-made form. The higher the score, the higher the awareness rate and satisfaction rate.

Statistical Processing

Adopted Statistical Package for the Social Sciences 18.0 (SPSS Inc.; Chicago, IL, USA) software to process data. Count data were expressed by chi-square test; measurement data were represented by mean and standard deviation, using *t*-test for comparison between groups, and $P < .05$ means the differences possessed statistical significance.

RESULTS

Comparison of Montreal Cognitive Assessment Scores and Self-care Assessment Ability of Daily Living Before and After Intervention Between Both Groups

Before the intervention, the differences in MoCA scores and self-care ability scores between both groups were not statistically significant ($P > .05$); after intervention, the MoCA scores and self-care ability of daily life of both groups improved to a certain extent, and the experimental group possessed remarkably better MoCA scores and self-care ability of daily life than the control group. The differences possessed statistical significance ($P < .05$), indicating that the experimental group had better interventions than the control group (Table 2).

Comparison of Awareness of Life Health Education and Patients' Satisfaction with the Nurses' Work After Intervention Between Both Groups

After the intervention, the comparison of patient health education awareness rates between the experimental and control groups revealed a significantly higher rate in the experimental group (83.89 ± 9.78) compared to the control group (74.62 ± 5.81), with a significant difference in scores ($t = 6.095$, $P = .000$) (Table 3). Similarly, nurse job satisfaction scores were significantly higher in the

Table 2. Comparison of MoCA and ADL Scores Between Both Groups Before and After Intervention ($\bar{X} \pm s$)

Group	Cases	MoCA Score		ADL Score	
		Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
Experimental group	56	14.19 ± 3.15	22.14 ± 3.36	23.60 ± 2.48	19.94 ± 2.44
Control group	56	14.64 ± 3.55	19.35 ± 3.22	23.73 ± 1.93	21.39 ± 1.90
t		0.702	4.475	0.297	3.493
P		.484	.000	.767	.001

ADL, activity of daily living scale; MoCA, Montreal Cognitive Assessment.

experimental group (92.75 ± 2.95) compared to the control group (89.69 ± 4.95), with a significant difference in scores (t = 3.961, P=.000) (Table 3).

DISCUSSION

Stroke is a clinically common cerebrovascular disease with high morbidity, disability, and mortality,[89] which is common in the elderly population. Clopidogrel is an anti-platelet active drug, and when used in the treatment of stroke in the elderly, it inhibits adenosine diphosphate receptors on the platelet surface to prevent thrombosis, achieve antiplatelet aggregation efficacy, and inhibit CD40L expression to maintain atherosclerotic plaques in a stable state and prevent the disease from continuing to progress. It has been found that after admission, healthcare professionals can improve the patient's prognosis through various treatments, care, rehabilitation exercises, and health guidance. It has been noted that more than half of stroke patients are left with symptoms such as memory, attention, comprehension, and decline,[10] because memory, attention, and comprehension decline, thinking skills decline, and information dissemination is impaired, affecting the patient's ability to perform, accept, and cooperate, creating barriers to further treatment, care, and rehabilitation interventions. These patients are unable to actively participate in the entire treatment process, passively accepting all treatment, rehabilitation training, and nursing interventions by nursing staff. After discharge from the hospital, they are also unable to follow the health education instructions of nursing staff, which seriously affects the patients' long-term quality of life, leading to a vicious circle.[11]

The central nervous system of stroke patients can compensate and recover itself structurally and functionally, and its natural recovery capacity is strong in the early stages of the disease. However, the plasticity of cortical function that occurs in the patient alone is very limited. It has been found that regular long-term cognitive training to stimulate the injured central nervous system can facilitate recovery and improve cognitive function in elderly stroke patients.[12] Patients' cognitive function improves, their cooperation with medical staff in treatment and care increases, and their compliance with treatment increases, which is conducive to disease recovery. Some studies have shown that cognitive training helps the central nervous system to establish new neural liaison pathways, promotes correct motor function and form, and facilitates the recovery of limb function and the improvement of the patient's ability to perform daily activities.[13]

Table 3. Comparison of Patient Health Education Awareness and Nurse Job Satisfaction Scores ($\bar{X} \pm s$)

Group	Cases	Health Education Awareness Rate	Nurse Job Satisfaction
Experimental group	56	83.89 ± 9.78	92.75 ± 2.95
Control group	56	74.62 ± 5.81	89.69 ± 4.95
t		6.095	3.961
P		.000	.000

Health education aims to provide patients with knowledge about disease prevention, treatment, and care, to avoid or eliminate factors that affect health, and to educate people to adopt good behavior and lifestyles. Traditional health education provides patients with direct knowledge of disease, diet, treatment, and functional exercise without considering individual differences. Individualized health education comprehensively assesses the patient and provides more targeted stroke health education based on the general education content. Due to the limitations of older stroke patients' ability to receive knowledge, this study created modules that combined health education knowledge with cognitive training and took individualized, targeted training. Patients were further reinforced to remember and implement the health education content alongside the cognitive training. This study found that after the intervention, the experimental group possessed a remarkably higher health education knowledge rate than the control group (P < .05), remarkably better MoCA and ADL scores than the control group (P < .05), and the patients in the experimental group were also significantly more satisfied with the work of the nursing staff than those in the control group (P < .05), with statistically significant differences.

In summary, the integration of individualized health education with cognitive training presents a compelling approach to enhancing multiple facets of patient well-being. By tailoring education and training to individual needs, this combined intervention demonstrates efficacy in bolstering patient cognitive function. Furthermore, it contributes to heightened awareness of stroke disease among the elderly, fostering better

health education adherence and empowering patients to adopt healthier lifestyle practices. Importantly, this intervention equips patients with improved self-care abilities for daily living tasks, ultimately culminating in an enhanced quality of life. Through its multifaceted benefits, the integration of individualized health education and cognitive training holds significant promise as a comprehensive strategy for promoting holistic well-being among patients.

Data Availability Statement: Written informed consent was obtained from all patients who agreed to take part in the study.

Ethics Committee Approval: This study was approved by the Geriatric Hospital of Hainan, Approval Number: EC201901035.

Informed Consent: Written informed consent was obtained from the patients who agreed to take part in the study.

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