

Effect of Nurse-Led Positive Psychological Intervention Based on the PERMA Model on Demoralization Syndrome in Elderly Stroke Patients: Study Protocol for a Randomized Controlled Trial

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Abstract: To explore the impact of nurse-led positive psychological interventions based on the PERMA model on demoralization syndrome in elderly stroke patients. Using the PERMA model as the theoretical basis, a literature review was conducted, combined with clinical practice and patient expectations to draft the initial intervention plan for demoralization syndrome. Through two rounds of delphi expert consultation, the final version of the plan was formed. A total of 15 experts were included, and the questionnaire response rate was 100% after 2 rounds; the experts' authority levels were 0.88 and 0.90 respectively; Kendall's harmony coefficients were 0.217 and 0.305 ($P < 0.001$). The final intervention plan consisted of 8 primary items, 8 secondary items, and 30 tertiary items, covering themes such as disease explanation and self-awareness, emotional expression and release, positive thinking, positive emotions, engagement, positive relationships, and meaning. The intervention plan for demoralization syndrome in elderly stroke patients based on the PERMA model is scientific, reliable, feasible, and practical, providing new ideas and methods for clinical nursing of elderly stroke patients.

1. Introduction

Stroke is the second leading cause of death worldwide and is characterized by high incidence, high recurrence rate, high disability rate, high mortality, and a substantial economic burden [1]. With aging, the incidence of stroke among the elderly in China shows a significant upward trend. Research indicates that the incidence of stroke in the elderly is 345.1 per 100,000, and the mortality rate among patients over 65 is 70% [2]. One-third of stroke patients suffer from depression due to poor functional recovery, decreased quality of life, and other factors [3]. The treatment and rehabilitation of stroke require long-term investment, and medical expenses impose a heavy

financial and emotional burden on families [5], causing substantial psychological and physiological stress to patients. In 2022, Clarke [1] proposed the concept of demoralization syndrome, a psychological state resulting from long-term stress or illness that one cannot adapt to, primarily manifested as feelings of helplessness, hopelessness, meaninglessness, subjective incompetence, and lowered self-esteem. The PERMA model is a framework in positive psychology for measuring well-being [5]. The model consists of five core components: positive emotion (P), engagement (E), relationships (R), meaning (M), and accomplishment(A), aiming to enhance patients' positive emotions, strengthen their sense of meaning and accomplishment, improve well-being, reduce negative emotions such as anxiety and depression, and enhance quality of life[6]. To improve demoralization syndrome in elderly stroke patients, it is crucial to formulate targeted policies and interventions. Based on this, the present study constructs a Demoralization Syndrome intervention program for elderly stroke patients using the PERMA model as the theoretical framework, aiming to provide guidance for alleviating demoralization syndrome in elderly stroke patients.

2. Methods

2.1. Establish a Research Group

The research team consists of seven members, including a graduate supervisor, a national level-2 psychological counselor, a nursing graduate student, a neurology resident, a head nurse of the neurology department, a neurology nurse, and a rehabilitation therapist, all participating in the project research. The graduate supervisor is responsible for guiding the entire team's work, ensuring the research design is reasonable, the data collection and analysis methods are reliable, and the research results are accurate and credible; the psychological counselor is responsible for psychological guidance; the graduate student is responsible for research design, data collection, data analysis, and analysis of research results; the neurology resident is responsible for treating and caring for patients; the head nurse of the neurology department is responsible for coordinating the intervention sites; the neurology nurse is responsible for the treatment, care, and health education of stroke patients; the rehabilitation therapist is responsible for providing rehabilitation guidance.

2.2. Preliminary Construction Plan

English search terms "stroke," "PERMA," "old," and "demoralization", we conducted searches on PubMed, Embase, Web of Science, CNKI, Wan Fang Data, Wei Pu Data, combining both subject terms and free words. Inclusion criteria were: 1) Study population: patients clinically diagnosed with stroke, aged ≥ 60 years; 2) Study topic: psychological interventions based on the PERMA model; 3) Outcome indicators: psychological-related measures; 4) Study types: randomized controlled trials, reviews, expert consensus, guidelines, systematic reviews, evidence summaries, quasi-experiments. Exclusion criteria were: 1) duplicate studies; 2) full text unavailable; 3) non-Chinese or non-English literature. Through two rounds of group meetings, group members organized and analyzed the literature, ultimately determining an intervention plan consisting of 8 primary items, 8 secondary items, and 36 tertiary items.

2.3. Expert Consultation

2.3.1. Preparation of the Expert Consultation Questionnaire

Based on the draft plan, the expert consultation questionnaire was prepared, consisting of three parts. The first part introduces the research concept, current research status, research background,

objectives, and significance to the experts. The second part is the intervention program indicators consultation questionnaire, in which the importance of each item is rated using a 5-point Likert scale, ranging from "Very Important" to "Not Important," assigned values from 1 to 5. In addition, each item includes options to add or remove content, allowing experts to supplement or modify each item. The third part collects basic information about the experts, including general profiles, basis for judgment, and familiarity with the topic.

2.3.2. Criteria for Expert Selection

Based on the professional fields involved in the study, experts were included if they met the following criteria: at least 10 years of work experience in fields such as elderly care, cerebrovascular diseases, neurology, psychiatry and psychology, and rehabilitation medicine with a professional rank of associate senior or above; a bachelor's degree or higher; and informed consent with voluntary participation in this study.

2.3.3. Implementation of Expert Consultation

Two rounds of expert consultation were organized and conducted from July to August 2024. The questionnaires were distributed either face-to-face or via email to ensure convenient participation and the collection of valuable feedback from experts. After the first round of questionnaires was promptly collected, the research team comprehensively compiled, organized, and analyzed the experts' opinions. Numerous team meetings were held, and based on the criteria for selecting indicators, namely that both importance and feasibility scores must meet thresholds of mean >3.50 and coefficient of variation <0.25 . On this basis, experts' comments and suggestions were fully considered, and each indicator was revised and improved item by item. The second round of expert consultation questionnaires was then issued, collected, analyzed, organized, and discussed again. When experts' opinions gradually reached consensus and the indicator system achieved the expected stability and reliability, the consultation was concluded, and the final plan was formed.

2.4. Statistical Methods

Data entry and statistical analysis were performed using Excel and SPSS 27. Measurement data conforming to a normal distribution were expressed as mean $\pm$ standard deviation; count data were expressed as frequency and percentage (%). The level of expert engagement was indicated by the effective response rate of the questionnaires, with an effective response rate $\geq 70\%$ representing good participation. The degree of expert authority was represented by the expert authority coefficient (Cr), determined by the expert judgment coefficient (Ca) and the expert familiarity coefficient (Cs), with $Cr = (Ca + Cs)/2$; $Cr \geq 0.70$ indicates a good level of expert authority. The degree of consensus among expert opinions was expressed by the coefficient of variation (CV) and Kendall's W coefficient of concordance, with Kendall's W ranging from 0 to 1, where higher values indicate greater consensus, and lower CV values indicate better agreement among experts[7]. Generally, when $CV \leq 0.25$, the consensus of expert opinions is considered acceptable [8]. $P < 0.05$ was considered statistically significant.

3. Results

3.1. Basic Information of Consulted Experts

Fifteen experts were selected for two rounds of expert consultation, including 11 women and 4 men; 6 were aged 30–39, 6 were aged 40–49, and 3 were aged 50 or older; 4 had a bachelor's

degree, 10 had a master's degree, and 1 had a doctoral degree; 7 had 10–19 years of work experience, 5 had 20–29 years, and 3 had 30 or more years; 10 held associate senior titles and 5 held senior titles.

3.2. The Enthusiasm and Authority of Experts

In the first round, 15 questionnaires were distributed and 15 were returned, with an effective recovery rate of 100%, and the rate of expert opinions being raised was 73%; in the second round, 15 questionnaires were distributed and 15 were returned, with an effective recovery rate of 100%, and the rate of expert opinions being raised was 20%. The *Cr* of experts consulted in the first round was 0.88, and the *Cr* of experts consulted in the second round was 0.90.

3.3. Degree of Coordination of Expert Opinions

In the first round of expert consultations, the overall coefficient of variation ranged from 0 to 0.287, and the overall Kendall's *W* for the indicators was 0.217 ($P < 0.001$); in the second round of expert consultations, the overall coefficient of variation ranged from 0 to 0.167, and the overall Kendall's *W* for the indicators was 0.305 ($P < 0.001$).

3.4. Results of Expert Inquiry

In the first round of inquiry, a total of 2 primary indicator titles, 3 secondary indicators, and 1 tertiary indicator content were modified, and 3 secondary indicators and 12 specific tertiary indicators were added; the second round of inquiry involved expert opinions and the resulting modifications. In the second round, 1 secondary indicator and 2 tertiary indicators were modified. The final draft of the intervention program for apathy syndrome in elderly stroke patients, based on the PERMA model, was completed, including 8 primary indicators, 8 secondary indicators, and 30 tertiary indicators, as detailed in Table 1.

Table 1 Intervention Program for Apathy Syndrome in Elderly Stroke Patients Based on the PERMA Model

Theme	Practice content	Intervention measures
Explanation of the Disease and Self-Perception	Understand your own illness and talk about the things that confuse you the most.	1.1.1 Fully collect the patient's basic information (such as age, gender, occupation, economic status, etc.), disease information (medical history, diagnosis, treatment plan, etc.), psychological state (anxiety, depression, fear, etc.), as well as their relationship with family and level of support.
		1.1.2 Provide a detailed explanation of the basic knowledge of stroke, including its causes, symptoms, treatment methods, preventive measures, and the rehabilitation process.
		1.1.3 Increase awareness of one's own illnesses, such as speech disorders, which may include articulation disorders, fluency disorders, resonance or prosody disorders, etc.
		1.1.4 Encourage patients who live alone, are DINKs (dual income, no kids), or are widowed to undergo regular health check-ups, and to promptly detect and control stroke risk factors such as high blood pressure and diabetes to reduce the risk of onset.
		1.1.5 Build a trusting relationship with patients through patient listening, active responses, and sincere care. Exchange contact information, such as phone numbers and We Chat, to ensure that both parties can maintain communication at any time.

Emotional Expression and Release	Deep breathing and relaxation training	2.1.1 Conduct in-depth interviews focusing on the patient's feelings after falling ill, encouraging them to talk about their negative thoughts and emotions.
		2.1.2 Provide timely feedback and support as patients express their feelings and emotions.
		2.1.3 Convey care, understanding, and support to patients through non-verbal means such as eye contact and appropriate physical touch.
		2.1.4 Guide patients to share positive and happy experiences by asking questions or sharing your own experiences, enhancing their self-esteem and optimism.
		2.1.5 Choose a quiet, distraction-free environment for deep breathing exercises. Relax the body and practice slow abdominal breathing: the abdomen naturally rises when inhaling and gradually relaxes when exhaling, helping patients relax and reduce tension.
Positive Thinkin	Record three good things every day or take photos to capture the beauty of life.	3.1.1 Introduce the positive effects of positive thinking on stroke patients' rehabilitation, including improving quality of life, enhancing motivation for recovery, and reducing psychological complications.
		3.1.2 Invite stroke patients who have successfully rehabilitated to share their experiences online, providing positive role models and motivation.
		3.1.3 Use voice messages to share with family or researchers three good things that happen each day, or take photos daily and post them on social media to record the beauty in life, to deeply experience the positive impact brought by gratitude.
Positive emotions	Watch movies, books, short videos, etc. with happiness as the theme	4.1.1 Through slides or videos, introduce the theory of positive psychology, present famous positive psychology experiments and research findings, and guide patients to view their current health conditions from a positive perspective, helping them recognize the beneficial impact of positive cognition on disease management.
		4.1.2 Provide relevant promotional videos such as "Life - Racing Against Stroke," "World Stroke Day - Every Second Counts to Save a Life," and recommend uplifting films like "Golden Times," "A Simple Life," and "The Piano in a Factory," to enhance patients' understanding and confidence in stroke rehabilitation.
		4.1.3 Encourage patients to cultivate positive emotions by practicing the use of positive words, such as "gratitude," "optimism," and "hope."
		4.1.4 When adverse events occur (such as physical dysfunction, obstacles in daily activities, social isolation, economic pressure, psychological stress, complications, or worsening health), guide patients to list their negative emotions and thoughts, learn to identify the pessimistic elements, teach them how to find evidence to refute these pessimistic thoughts, and attempt to reinterpret and reconstruct them from an optimistic perspective.
Engagement	Devote oneself to practice	5.1.1 Conduct lectures focused on the definition and positive effects of "engagement" to help patients understand how to enter an "engaged" state in different situations.
		5.1.2 Organize experiential activities based on patients' interests and abilities, such as painting, music, reading, playing chess, participating in square dancing, practicing Tai Chi, and performing Baduanjin exercises.
		5.1.3 For patients with physical activity disorders, conduct

		targeted exercise training such as muscle strength exercises (e.g., making fists, leg lifts, chest stretches), joint mobility exercises (flexion and extension, internal and external rotation), and balance and coordination training (e.g., standing on one foot, standing on both feet, dancing to music) to restore or improve physical function and enhance quality of life.
Positive Relationship	Communicate with family or friends via We Chat video or phone calls	6.1.1 Conduct lectures focusing on 'interpersonal relationships,' using examples to demonstrate the positive effects of good interpersonal relationships on physical and mental health.
		6.1.2 Introduce basic communication methods and skills, and through explanation and demonstration, help patients master skills such as listening, expressing themselves, and non-verbal communication.
		6.1.3 Guide patients to practice using others' words and actions in a positive way, and encourage patients to sincerely express gratitude for others' help.
		6.1.4 Design interactive activities that allow patients to experience the pleasure and value of communication through practice.
Meaning	Guide patients to develop a positive life outlook	7.1.1 Guide patients to understand knowledge related to the meaning of life, using a combination of slides and documentaries to present real-life cases of the meaning of life, showing how people can find and realize their life purpose at different stages of life.
		7.1.2 Guide patients to share cases of successfully overcoming adversity and encourage them to view challenges as catalysts for growth.
		7.1.3 Explore the patient's unique role within the family and how it influences discussions about the multidimensional meaning of life, such as the meaning of life, the meaning of living, the meaning of relationships with loved ones, and the meaning of health.
Accomplishment	Set personal rehabilitation goals and engage in rehabilitation exercises	8.1.1 Conduct in-depth interviews to understand patients' perceptions of a sense of achievement and explain the positive impact of a sense of achievement on psychological well-being.
		8.1.2 Collaborate with patients to set short-term or long-term rehabilitation goals, ensuring these goals are Specific, Measurable, Attainable, Realistic, and Time-bound (SMART principles). Cultivate a positive mindset in patients and allow them to experience a sense of achievement and happiness throughout the rehabilitation process.
		8.1.3 Record the rehabilitation exercises completed independently by the patient every day. Regularly assess the patient's rehabilitation progress and review achievements with the patient to enhance their motivation and confidence.

4. Discussion

4.1. The protocol for apathy syndrome in elderly stroke patients established in this study is scientific and reliable

This study is based on the PERMA model as its theoretical foundation. The initial draft of the intervention program was constructed through literature analysis and research group discussions. The program was then reviewed and refined through two rounds of expert consultation, during

which indicators were added, deleted, or modified. The selected experts all have over 10 years of experience in the relevant field and possess solid theoretical knowledge and practical experience. The effective response rate for both rounds of expert consultation was 100%, with 73% of issues raised in the first round and 20% in the second round, indicating a high level of engagement among the experts. The average authority coefficients of experts in the two rounds of consultation were 0.88 and 0.90, demonstrating high expert authority. The Kendall harmony coefficients for the two rounds of consultation were 0.217 and 0.305 ($P < 0.001$), and the coefficient of variation for expert ratings on the importance of each item ranged from 0 to 0.287 and 0 to 0.167, respectively, indicating a trend toward consensus and good coordination among expert opinions. In summary, the program is not only grounded in theoretical foundations but also integrated with valuable practical experience. Its content is both scientific and highly reliable. Therefore, this program can provide effective guidance and support for clinical psychological intervention in elderly patients with stroke.

4.2. The syndrome management program for apathy in elderly stroke patients developed in this study is feasible and practical

The program for elderly stroke patients based on the PERMA model, through positive psychological interventions, has been proven to be significantly feasible and practical [9]. Elderly stroke patients often face the dual challenges of physical function decline and psychological stress. The PERMA model, which encompasses five dimensions—positive emotion, engagement, relationships, meaning, and accomplishment—aims to comprehensively enhance individuals' well-being and life satisfaction [9]. In addition, personalized psychological interventions can improve the negative emotions and mental health of elderly stroke patients, and positive emotions help increase patients' adherence to rehabilitation treatments [9]. Continuous psychological intervention can more effectively reduce anxiety and depression levels in stroke patients, while also improving self-care abilities and daily functioning [10]. Good interpersonal relationships and a sense of engagement enable patients to better integrate into the rehabilitation environment. Focusing on meaning and accomplishment can rekindle patients' hope and confidence in life. Enhancing positive emotions also promotes the recovery of physical function, thereby improving patients' overall quality of life and reducing the burden on families and society. Therefore, this comprehensive psychological intervention approach not only helps improve the level of learned helplessness in patients but also promotes functional recovery and social participation, demonstrating broad prospects for application in clinical practice.

5. Conclusions

This study developed an intervention program for apathy syndrome in elderly stroke patients based on the PERMA model through literature review and the Delphi expert consultation method. Although this program has not yet been applied in clinical practice and its feasibility and effectiveness have not been practically verified, subsequent feasibility studies and pilot experiments will be conducted to assess it, providing solid theoretical support and practical guidance for future caregivers.

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