ANALYSIS OF THE EFFECT OF POSITIVE SELF BEHAVIOR INTERVENTION ON FPS, FBG, AND HCT IN MIGRAINE PATIENTS

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Abstract:

Objective: For exploring the positive self-behavior intervention on the scores of facial pain scale (FPS), fibrinogen (FBG) and hematocrit (HCT) in migraine patients.

Method: 80 migraine patients who were treated at our hospital from January 2022 to December 2022 were retrospectively selected from the hospital records. They were separated into groups. The control group (n=40) received routine nursing intervention, while the research group (n=40) received positive self-behavior intervention based on the control group. The health behavior, pain perception, FBG, and HCT levels of the patients participating in the experiment were compared.

Results: Before the intervention, there was no statistically significant difference in health behavior scores, FPS scores, FBG, and HCT levels among the patients participating in the experiment ($P>0.05$); After intervention, the research group showed higher scores in regular medication, dietary norms, quantitative exercise, and pain control relative to the control group, with statistically significant disparities ($P<0.05$); The FPS score of the research group was below that of the control group, and the disparity was statistically significant ($P<0.05$); The levels of FBG and HCT in the research group were lower than those in the control group, and the disparity was statistically significant ($P<0.05$).

Conclusion: Positive self-behavior intervention promotes migraine patients for improving and maintaining their own healthy behavior, reduce pain sensation, and maintain normal levels of FBG and HCT indicators.

Key words: Positive Self Behavior Intervention; Migraine; Pain Sensation; Fibrinogen; Hematocrit

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Introduction:

Migraine is a neurovascular disease [1]. According to the World Health Organization, such diseases have been included in the category of functional disabilities, posing a serious threat to people's lives and health. According to the domestic data survey [2], the incidence rate of migraine in neurology can reach 10%, which requires clinical attention to the disease. At present, drugs are mainly used in clinical practice to control the frequency of disease onset and minimize the duration of pain, to improve the symptoms and signs of the disease. However, the disease has a long course and is characterized by recurrent attacks. If the patient is unable to maintain healthy behavior habits, such as not following the doctor's instructions for medication, not maintaining good eating and exercise habits, it increases the frequency of disease attacks and exacerbates the body's pain sensation. This can also have adverse consequences for the condition. Traditional routine nursing implementation, although to some extent helping patients maintain their condition, lacks targeted and systematic care, resulting in limited nursing effectiveness. Therefore, combining scientific and targeted nursing care with clinical treatment for migraine patients is an urgent problem that needs solving in clinical practice. The positive behavior support method was proposed and applied in 1980 as a more humane nursing measure. It is mainly used for correcting individual behavior, aiming to effectively improve individual bad behavior through behavioral support. With the development of nursing, positive self-behavior intervention has been applied in clinical practice, which can promote individual ability improvement, help individuals improve bad behavior habits, and improve their quality of life [3]. Derieux C et al. [4] applied positive behavioral support therapy to children with autism, improving their clinical symptoms and signs, and promoting disease recovery. This topic is for analyzing the influence of positive self-behavior intervention on the facial pain scale (FPS) score, fibrinogen (FBG) and hematocrit (HCT) of migraine patients. The content is reported as follows.

Research Materials and Methods

Research Data

80 migraine patients who were treated at our hospital from January 2022 to December 2022 were retrospectively selected from the hospital records. They were separated into groups: a control group (CG) and a research group (RG), with 40 patients in every group. There was no statistically significant difference (SD) among the patients participating in the experiment in age, sex, disease course, history of migraine aura, disease cause, and educational background (P>0.05). Table 1 indicates the details

Table 1: Demographics of patients included

Group	Number of cases	Age (years)	Gender		Disease course (year)	History of migraine with aura	
			Male	Female		Yes	No
CG	40	36.15±5.26	21（52.50）	19（47.50）	4.16±1.05	15（37.50）	25（62.50）
RG	40	36.40±5.09	23（57.50）	17（42.50）	4.32±1.01	18（45.00）	22（55.00）

Group	Number of cases	Disease etiology		Educational background		
		Vasospasm	Cerebral vascular insufficiency	Junior high school and below	High school or technical secondary school	College degree or above
CG	40	23（57.50）	17（42.50）	5（12.50）	22（55.00）	13（32.50）

RG	40	20（50.00）	20（50.00）	2（5.00）	24（60.00）	14（35.00）

Inclusion and Exclusion Criteria

Inclusion criteria: (A) Comply with the relevant diagnostic content standards of the The International Classification of Headache Disorders (ICHD-3) [5]; (B) Disease history ≥ 1 year; (C) FPS score ≥ 4 points; (D) Not participating in other studies within the past 3 months; (E) The patient's cognitive and reading and writing abilities are normal and can cooperate with nursing implementation.

Exclusion criteria: (A) Patients with long-term migraine and medication duration>10 days per month; (B) Secondary headaches, such as cluster headaches and tension headaches; (C) Concomitant epilepsy; (D) Merge diseases of the immune system, respiratory system, or blood system; (E) Congenital malformation of intracranial blood vessels.

Research Method

Control Group: Routine nursing intervention was administered. It maintained a clean and tidy indoor environment, adjusted appropriate humidity and temperature; And arranged nursing operations during non rest hours, kept the ward quiet and comfortable, regularly disinfected the ward, and closely observed the patient's clinical symptoms and signs; If there were pain symptoms, timely helped with physical pain relief or reported to a physician for medication pain relief treatment. The patient was advised to strictly follow the doctor's instructions for medication, not to reduce or increase their daily medication dosage without authorization, and to regularly monitor the frequency of headaches, and report any abnormalities promptly. It guided patients in their daily diet, exercise, and sleep, instructed them to eat regularly and regularly, avoiding overeating and overeating, ensured adequate intake of nutrients such as protein, vitamins, and carbohydrates daily, and conducted regular activity training; Then, according to one's own situation and preference for training methods, gradually implemented them, avoided vigorous exercise, developed a habit of going to bed and getting up early, and regularly fell asleep and woke up. Nursing was carried out once a day, from admission to discharge.

Research Group: It implemented positive self-behavior intervention based on the CG. It established an individual self behavior control plan. Responsible nurses helped patients establish personalized self-behavior control plans based on their individual characteristics, daily habits, and dietary habits; and assisted them in developing a behavior control plan, detailing specific matters such as daily diet, exercise, sleep, and medication in the self behavior control plan; Then the nurse asked the patients and their families to confirm their signatures after completing the corresponding items in the schedule every day. The responsible nurse checked every week, evaluated their condition with the attending physician, and analyzed the reasons for not reaching the standard; Then, based on the evaluation results, it adjusted the content in the plan table, and the intervention content is detailed in Table 2.

Table 2 Self Behavior Control Plan

Intervention projects	Details	Completion evaluation
Regular medication	①Clarify medication: Learn about the effects of medication application. The responsible nurse will display the name, dosage, medication route, medication frequency, medication effects, adverse drug reactions, and precautions to the patient in graphic and textual form; Then the nurse distributes the graphic and textual materials to the patient, instructing them to study daily and understand their mastery.	complete□incomplete□ Reason analysis for incomplete completion

	②Strictly follow medical advice for medication: Help patients establish medication diaries and instruct them to maintain good medication habits through alarm clocks and mobile software and adhere to and regularly administer medication.	complete□incomplete□ Reason analysis for incomplete completion
	③Medication status report: During medication, daily feedback on drug effects should be provided to the responsible nurse, or adverse reactions should be reported to the responsible nurse in a timely manner to address any adverse issues.	complete□incomplete□ Reason analysis for incomplete completion
Standardized diet	①Dietary principle: Eat regularly and quantitatively, chew slowly, and control the eating time to 15 minutes.	complete□incomplete□ Reason analysis for incomplete completion
	②Dietary taboos: Do not consume strong tea, coffee, or carbonated beverages; Strictly quit smoking and alcohol; Avoid or reduce intake of high fat and calorie foods (fried, fatty, hamburgers); Cold, spicy, and stimulating food.	complete□incomplete□ Reason analysis for incomplete completion
	③Types of dietary intake: The diet should mainly be high in protein, fiber, and fat (including lean meat, grains, fresh vegetables, and fruits), ensuring a daily intake of 2500mL of warm water.	complete□incomplete□ Reason analysis for incomplete completion
Quantitative motion	①Development of exercise plan: The attending physician assists the responsible nurse to help patients develop individual exercise plans, and requires patients to implement quantitative exercise training according to the plan.	complete□incomplete□ Reason analysis for incomplete completion
	②Sports form selection: Choose different aerobic exercise methods based on your favorite sports at the basic level, such as jogging, dancing, walking, and ball games. Team sports and family accompanying sports should be the main options.	complete□incomplete□ Reason analysis for incomplete completion
	③Exercise time control: Control the exercise time between 30-60 minutes each time, and conduct warm-up and stretching training for 5-10 minutes before and after the exercise. Exercise 3-5 times a week, and continue for 3 months as a course of treatment.	complete□incomplete□ Reason analysis for incomplete completion
	④Exercise intensity control: Exercise should be controlled at medium to high intensity, and the maximum heart rate can be controlled at 64%~76% or 77%~95% through a sports watch, with the former being the main control.	
	⑤Exercise precautions: If there is obvious dizziness, exercise should be prohibited or stopped. Strictly follow the doctor's advice plan for quantitative exercise, timely feedback on exercise situation, and work with nursing staff to improve the exercise plan.	complete□incomplete□ Reason analysis for incomplete completion
Pain control	①Mild pain control: Relieve pain sensation through relaxation training guided by nursing staff. Relaxation training method: Play your favorite light music, maintain a comfortable position, and first feel the body's relaxed and tense state; Then, perform a full body muscle relaxation training, maintain muscle tension at a certain position for 5 seconds, then relax, and proceed to the next position for muscle relaxation. This can be done during pain, or once a day early or before bedtime.	complete□incomplete□ Reason analysis for incomplete completion

	②：Moderate to severe pain: Determine the nature of the headache, record the degree, duration, and accompanying symptoms of the pain, promptly report to the nurse, and follow the doctor's instructions for medication and analgesic treatment.	complete□incomplete□ Reason analysis for incomplete completion

Observation Indicators and Evaluation

General information: Data was collected through evidence-based inquiry and a self-designed questionnaire by investigators to investigate the actual situation and recorded in a register. Data for our study was collected through that register. The name of the content item was age, gender, disease course, history of migraine aura, disease cause, and educational background.

Health behavior: Based on the Self rated Health Practice Scale (SRAHP) of pulmonary tuberculosis patients [6], combined with the patient's situation in this study, a self-made health behavior questionnaire was developed and self-assessed by the patients. The table consists of 4 dimensions and 20 entries; This included regular medication (5 items), dietary norms (5 items), quantitative exercise (5 items), and pain control (5 items). A score of 1-5 levels was applied, including a total of 20-100 points. Healthy behavior is proportional to the score. The Cronbach's α coefficient value of the questionnaire was 0.872, and the CVR value was 0.891, revealing good reliability and validity (RV).

Pain perception: The Faces pain scale (FPS) was used to assess the patient's own pain perception [7]. The scale included 6 facial expression images that were close to normal people, ranging from 0 to 10 points, representing different levels of pain. The patient selected the corresponding images for determining the pain rating. The feeling of pain was directly proportional to the score. The Cronbach's α coefficient value of the scale was 0.872, and the CVR value was 0.891, demonstrated a good RV.

Blood indicators: The attending physician evaluated the following indicators through the laboratory: fibrinogen (FBG) and hematocrit (HCT); The patient was instructed to take venous blood on an empty stomach and place it in a silicified glass tube, mixed evenly with 0.0109M sodium citrate at a ratio of 9:1, centrifugated it at a centrifugation speed of 3000rpm for 15min, and took the upper plasma for detection and evaluation within 2-3 hours; Collected HCT blood samples using a 2% EDTA-K2 anticoagulant tube, mixed thoroughly, and used a blood cell analysis instrument for detection.

Statistical processing

The data were entered into the statistical software SPSS 26.0 by two people, and the measurement data conforming to the normal distribution were described by (x±s). An independent sample *t*-test was performed between groups; It described the counting data with [n (%)] and performed x^2 test among the patients participating in the experiment. $P<0.05$ indicated a statistically significant difference.

Comparison of two sets of information materials

Statistically SD did not exist among the patients participating in the experiment in age, sex, disease course, history of migraine aura, disease cause, and educational background ($P>0.05$). Table 3 indicates the details.

Table 3 Two sets of Information Materials (x±s, %)

Group	Number of cases	Age (years)	Gender		Disease course (year)	History of migraine with aura	
			Male	Female		Yes	No
CG	40	36.15±5.26	21（52.50）	19（47.50）	4.16±1.05	15（37.50）	25（62.50）
RG	40	36.40±5.09	23（57.50）	17（42.50）	4.32±1.01	18（45.00）	22（55.00）
x^2/t		0.216	0.202		0.695	0.464	

P	0.830	0.653	0.489	0.496

Group	Number of cases	Disease etiology		Educational background		
		Vasospasm	Cerebral vascular insufficiency	Junior high school and below	High school or technical secondary school	College degree or above
CG	40	23（57.50）	17（42.50）	5（12.50）	22（55.00）	13（32.50）
RG	40	20（50.00）	20（50.00）	2（5.00）	24（60.00）	14（35.00）
x^2/t		0.453		1.410		
P		0.501		0.494		

Comparison of Health Behavior Scores among the Patients Participating in the Experiment before and after Intervention

Before intervention, there was no statistically significant difference in health behavior among the patients participating in the experiment (P>0.05); After intervention, the scores of regular medication, dietary norms, quantitative exercise, and pain control increased in both groups; The RG was higher than the CG, with a statistically significant difference (P<0.05), Table 4 illustrates the details.

Table 4 Health Behavior Scores of the Patients Participating in the Experiment before and after Intervention($\bar{x}$±s，score)

Group	Number of cases	Regular medication		Dietary norms	
		Before intervention	After intervention	Before intervention	After intervention
CG	40	15.16±2.36	19.37±3.18*	16.48±2.16	20.05±2.67*
RG	40	15.34±2.09	21.37±3.21*	16.50±2.09	22.18±2.71*
t		0.361	2.799	0.042	3.541
P		0.719	0.006	0.967	0.001

Group	Number of cases	Quantitative motion		Pain control	
		Before intervention	After intervention	Before intervention	After intervention
CG	40	14.22±1.67	18.67±2.49*	15.08±1.67	19.67±2.06*
RG	40	14.53±1.29	20.67±3.07*	15.42±1.21	21.08±2.67*
t		0.929	3.200	1.043	2.644
P		0.356	0.002	0.300	0.010

Note: * Relative to before intervention, P<0.05.

Compared with the CG who received routine nursing intervention, the RG who received positive self-behavior intervention showed improvements in medication, dietary norms, quantitative exercise, and pain control scores; The comparison of changes in the levels of various indicators such as regular medication, dietary norms, quantitative exercise, and pain control is shown in Figure 1 (a), Figure 1 (b), Figure 1 (c), and Figure 1 (d), respectively. This indicates that there was no statistically significant difference in various indicators between the two groups before intervention (*P*>0.05); After intervention, all indicators in the study group were higher than those in the CG (*P*<0.05).

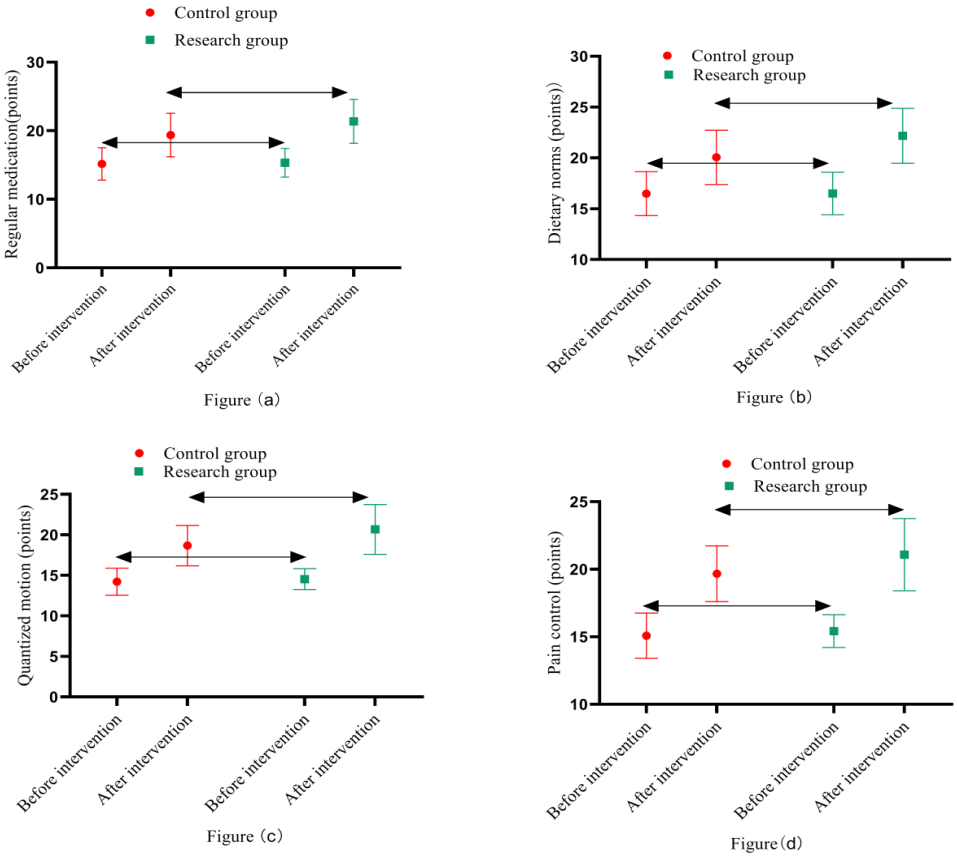

Figure 1 Health behavior scores of two groups of patients before and after intervention

Note: Figure 1 (a) shows regular medication indicators; Figure 1 (b) shows dietary norms indicators; Figure 1 (c) shows quantitative exercise indicators; Figure 1 (d) shows pain control indicators; The red circle represents the CG, and the green square represents the study group; The length of the marker line represents the comparison of various indicators between the two groups before and after intervention.

Comparison of FPS scores among the patients participating in the experiment before and after intervention

Before intervention, there was no statistically significant difference in FPS scores between the two groups (P>0.05); After intervention, the FPS scores of both groups decreased, and the study group was lower than the CG, with a statistically SD (P<0.05), as shown in Table 5.

Table 5: FPS scores of the Patients Participating in the Experiment before and after Intervention (x±s, score)

Group	Number of cases	FPS score		t	P
		Before intervention	After intervention		
CG	40	6.26±1.75	3.59±0.86	2.793	0.007
RG	40	6.37±1.18	1.78±0.67	7.411	0.000
t		0.405	3.655		
P		0.687	0.001		

Note: FPS: Facial Expression Pain Scale.

Compared to the CG that received routine nursing intervention, the RG that received positive self-behavior intervention showed a decrease in FPS scores. The changes in FPS score levels are shown in Figure 2. It indicates that there was no statistically significant difference in FPS scores among the patients participating in the experiment before intervention (P>0.05). After intervention, the FPS scores of the study group were lower than those of the CG (P<0.05).

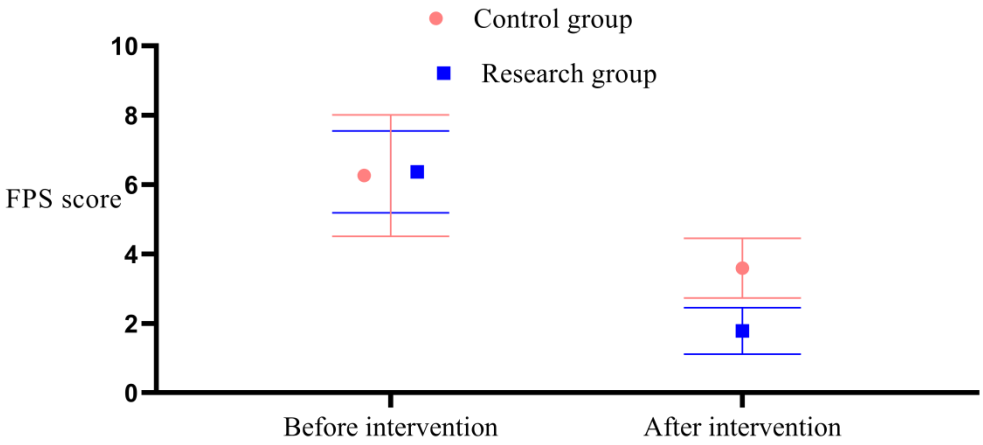

Figure 2 Comparison of FPS Scores between the Patients Participating in the Experiment before and after Intervention

Note: The pink circle represents the CG; The blue square represents the RG, and a set of graphics (in position) represents the comparison of FPS scores between the two intervention groups.

Comparison of FBG and HCT levels between two groups of Migraine Patients before and after intervention

Before intervention, statistically significant difference did not exist in FBG and HCT levels among the patients participating in the experiment (P>0.05); After intervention, the FBG and HCT among the patients participating in the experiment diminished, and the RG was lower than the CG, with a statistically SD (P<0.05), as shown in Table 6.

Table 6: FBG and HCT levels in two groups of migraine patients before and after intervention (x±s)

Group	Number of cases	FBG(g/L)				HCT（%）			
		Before intervention	After intervention	*t*	*P*	Before intervention	After intervention	*t*	*P*
CG	40	3.82±1.21	3.05±0.67	3.521	0.001	54.38±6.15	39.46±5.16	11.754	0.000
RG	40	3.97±1.17	2.07±0.35	9.840	0.000	54.26±6.09	33.29±4.28	17.818	0.000
t		0.564	8.199			0.088	5.821		
P		0.575	0.000			0.930	0.000		

Note: FBG: Fibrinogen; HCT: hematocrit.

Compared with the CG receiving routine nursing intervention, the RG receiving positive self-behavior intervention showed a decrease in FBG and HCT levels. The changes in the levels of two indicators are detailed in Figure 3 (a) and Figure 3 (b). It showcases that there was no statistically significant difference in FBG and HCT levels between the two groups before intervention (P>0.05). After intervention, the FBG and HCT

levels in the RG were lower than those in the CG (P<0.05).

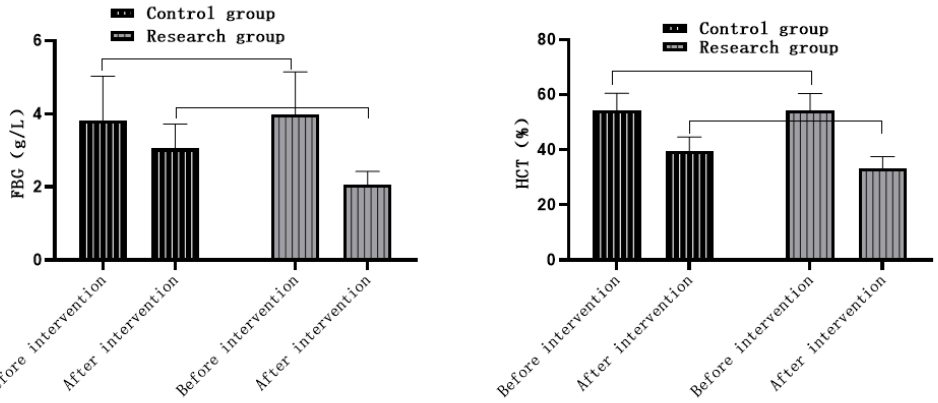

Figure 3 Comparison of FBG and HCT levels before and after intervention

Note: Figure 3 (a) represents the FBG indicator, and Figure 3 (b) represents the HCT indicator; The black column represents the CG, while the gray column represents the RG. The height and fluctuation of the column reflect the comparison of indicators between the two groups before and after intervention.

Discussion

Analysis of the Significance of Positive Self Behavior Intervention in Migraine Patients

The pathogenesis of migraine is not yet clear, and research analysis shows that genetics, food, medication, and stress may all be closely related to the occurrence of the disease [8]. After the onset of the disease, it often manifests as one or both sides of pulsatile headache, with the highest incidence of unilateral head pain, often accompanied by symptoms of autonomic nervous system dysfunction like nausea, vomiting, fear of light and sound. The treatment of migraine with clinical drugs can effectively alleviate symptoms and signs. However, due to the recurrent nature of the disease, the recurrence rate of the disease increases, which enhances clinical attention to external influencing factors in migraine patients [9]. Research by Murray AM et al. [10] shows that improving the daily diet and exercise of migraine patients, ensuring regular medication use, better controlling pain symptoms, helping patients maintain good behavioral habits, can significantly improve the condition, and reduce disease recurrence. Mertens ECA et al. [11] have shown that positive self-behavior intervention, as a positive behavioral support method, is an intervention measure that provides behavioral guidance to individuals by establishing positive behavior rather than blindly emphasizing indoctrination. It is patient-centered and emphasizes long-term and effective reduction or prevention of adverse behavior problems, maintaining good behavioral habits, improving the condition, and promoting disease prognosis. At present, there is relatively little clinical research on implementing positive self-behavior intervention in migraine patients. Based on this, this study combines positive self-behavior intervention with treatment in migraine patients. This study found that the implementation of intervention methods significantly improves patients' unhealthy behavior, alleviates pain perception, and enhances the effectiveness of disease treatment, with certain effective effects.

The Effect of Positive Self Behavior Intervention on the Health Behavior of Migraine Patients

The outcomes indicated that patients in the RG who implemented positive self-behavior intervention showed improvements in regular medication,

dietary norms, quantitative exercise, and pain control relative to patients in the CG who implemented traditional routine intervention. Masi A et al. [12] showed that applying positive behavior support interventions in school-age children can enhance their adverse behavior problems, enhance their compliance with disease treatment, and improve their quality of life, like the results of this study. The occurrence of bad behavior is closely related to individual age, cognition, and targeted nursing implementation. Under the influence of adverse factors, patients themselves cannot recognize the importance of healthy behavior habits in improving their condition, leading to adverse behavior habits affecting the treatment and rehabilitation of the condition [13]. Positive self-behavior intervention corrects the nursing shortcomings of previous single guidance and indoctrination, emphasizes the improvement of patients' bad behavior habits, and helps patients establish an individual plan to maintain good behavior; Then, by strengthening the patient's adherence to medical advice and regular medication, regulating diet, quantifying exercise, and implementing training to alleviate pain, the patient's adverse behavior habits during treatment can be comprehensively supervised and guided; And this enables patients to actively correct and improve unhealthy behaviors based on their own abilities, enhancing the scores of various health behavior abilities [14-15].

The Effect of Positive Self Behavior Intervention on Pain in Migraine Patients

This study showed that relative to the CG, the FPS scores of the RG were all reduced, conforming to the outcomes of Fontaine D et al. [16]. Pain is a typical clinical symptom and sign of migraine, and in the early stages of the disease, it often appears as faint pain; As the condition gradually progresses, it transforms into pulsatile pain and becomes more active. The implementation of positive self-behavior intervention in the study is mainly reflected in two aspects of improving patients' pain sensation, physical analgesia, and drug analgesia, both of which are effective ways to control pain sensation in clinical practice [17]. In the intervention of positive self-behavior, patients are guided to learn medication knowledge through graphic manuals, clarify the significance of medication analgesia, and follow medical advice in a regular and quantitative manner with the help of medication logs, alarm clocks, and mobile software. This enhances the effectiveness of medication application and has an effective effect on improving moderate to severe pain [18]. Mild pain patients, on the other hand, implement physical pain control without achieving medication, and achieve pain relief through music relaxation training [19]. The implementation of the above nursing measures reduces the FPS score of migraine patients.

The Effect of Positive Self Behavior Intervention on FBG and HCT Levels in Migraine Patients

The outcomes indicated that the levels of FBG and HCT in migraine patients in the RG are lower than those in the CG. The increase in FBG and HCT levels indicates an increase in blood viscosity in the body; This process damages the tunica intima, which leads to the occurrence of cerebrovascular microcirculation disorders [20]. The implementation of positive self-behavior intervention to help patients establish individual health behavior control plans; And through strengthened nursing guidance in various aspects such as medication, diet, exercise, and pain control, patients can maintain good healthy behavior habits during disease treatment, and improve the level of cooperation between treatment and nursing implementation; This is also to significantly improve the treatment effect of the disease while ensuring the smooth implementation of treatment. With the improvement of clinical symptoms and signs, the degree of damage caused by blood viscosity to cerebral blood vessels is reduced, thereby reducing FBG and HCT levels [21].

Conclusion:

In summary, implementing positive self-behavior

intervention in migraine patients can help them maintain healthy behavioral habits in accordance with medical advice; While highly cooperating with intervention implementation, it can improve pain symptoms, promote rapid recovery of the condition, and reduce blood flow levels of FBG and HCT.

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