

## Research Article

# Study on the Effect of Positive Psychological Intervention Based on PERMA Model on Perioperative Patients with AIDS Complicated with Breast Cancer

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**Objective.** To study the effect of positive psychological intervention based on PERMA model on perioperative AIDS patients complicated with breast cancer. **Methods.** A total of 120 perioperative patients with AIDS complicated with breast cancer treated in our hospital from January 2021 to December 2021 were randomly divided into research group ( $n = 60$ ) and control group ( $n = 60$ ). The research group received positive psychological intervention based on PERMA model, while the control group received routine nursing. The scores of disease uncertainty scale (MUIS), Frankl treatment compliance scale, cancer-related fatigue scale, self-rating anxiety scale (SAS), self-rating depression scale (SDS), and quality of life scale EORTCQLQ-C30 (v3.0) were studied. **Results.** After 12-week nursing, the MUIS score of the research group was lower than that of the control group, and the difference was statistically significant ( $P < 0.05$ ). After 12 weeks of nursing, the score of Frankl treatment compliance scale in the research group was higher than that in the control group, and the difference was statistically significant ( $P < 0.05$ ). Following 12-week nursing, the scores of SAS and SDS in the research group were lower than those in the control group, and the difference was statistically significant ( $P < 0.05$ ). After 12 weeks of nursing, the score of cancer-related fatigue scale in the research group was lower than that in the control group, and the difference was statistically significant ( $P < 0.05$ ). The EORTCQLQ-C30 (v3.0) scale-symptom domain score in the research group was lower than that in the control group following 12-week nursing, and the difference was statistically significant ( $P < 0.05$ ). After 12 weeks of nursing, the EORTCQLQ-C30 (v3.0) scale-overall health domain score and functional domain score in the research group were higher than those in the control group, and the difference was statistically significant ( $P < 0.05$ ). **Conclusion.** The application value of positive psychological intervention based on PERMA model in perioperative patients with AIDS complicated with breast cancer is more significant. It contributes more to treatment compliance and improves negative feelings of anxiety and depression.

## 1. Introduction

Acquired immunodeficiency syndrome (AIDS) is a highly contagious infectious disease caused by human immunodeficiency caused by human infection with human immunodeficiency virus (HIV) [1]. AIDS cannot be cured, because HIV specifically invades human CD4<sup>+</sup> cells, causing serious damage to the human immune system. By the end of 2017, there

were 36.9 million people living with HIV worldwide, of which 1.8 million were new HIV infections [2]. In China, as a country with a large population, the number of new AIDS patients is also very staggering. From 2012 to 2017, the number of new cases of HIV/AIDS in China increased from 82434 to 134512 every year and there is still an upward trend [3, 4]. According to the latest data of the Chinese Center for Disease Control and Prevention, there were 445716

cases of HIV infection and 323456 cases of AIDS in China by the end of January 2018 with 241519 reported deaths [5]. The widespread spread of AIDS has become a serious social problem.

AIDS patients with depression need effective psychological intervention and support to ensure the effectiveness and health of nursing measures. A large number of foreign studies have examined the effect of psychological intervention on AIDS patients from an empirical point of view, which is effective in immune function, emotional regulation, compliance, and high-risk sexual transmission blocking. According to clinical studies, a large number of AIDS patients suffer from malignant tumors. Before 1995, AIDS-related malignant tumors such as Kaposi's sarcoma, non-Hodgkin's lymphoma, and invasive cervical cancer accounted for 80% of the total cancer burden of AIDS patients [6, 7]. In recent years, due to the improvement of the level of antiretroviral therapy and the level of minimally invasive breast surgery, the survival rate of AIDS patients with breast cancer has also been effectively improved [8]. However, AIDS patients with breast cancer still need to face various problems such as social discrimination, economic, and mental pressure. AIDS combined with breast cancer not only seriously damages the life and health of patients but also brings more serious psychological trauma to patients [9, 10]. Numerous studies have pointed out that psychological intervention can play an important and positive role in the maintenance of AIDS and mental health [11–13]. With the popularization of treatment, the proportion of malignant tumors in AIDS patients has changed greatly and the proportion of non-HIV-related malignant tumors such as breast cancer has increased significantly [14–17]. PERMA model is a happiness model proposed by Seligman, which consists of five elements such as positive emotion, input, interpersonal relationship, meaning, and achievement. The theory holds that having these five elements can overcome negative emotions and have a happy life [18]. At present, PERMA model has been used in stroke disabled patients [19], AIDS hospitalized patients [20], disabled college students [21], and achieved good results, but it is not known whether this model is suitable for perioperative AIDS patients with breast cancer in China. Therefore, this paper studied the effect of positive psychological intervention based on PERMA model on perioperative patients with AIDS complicated with breast cancer.

## 2. Materials and Methods

**2.1. General Information.** A total of 120 perioperative AIDS patients with breast cancer treated in our hospital from January 2021 to December 2021 were selected. 120 perioperative AIDS patients with breast cancer were randomly divided into research group ( $n = 60$ ) and control group ( $n = 60$ ). In the research group, the age ranged from 25 to 67 years old with an average of  $54.48 \pm 5.16$  year old. In the control group, the age ranged from 25 to 68 years old with an average of  $54.15 \pm 5.33$  years old. There was no significant difference in general data between the two groups ( $P > 0.05$ ).

Inclusion criteria are as follows: (1) female patients with primary breast cancer who met the indications for surgical

treatment; (2) hospitalized patients diagnosed with AIDS; (3) those who had access to the Internet and were proficient in using WeChat; (4) their condition was basically stable and can basically take care of themselves. No special hobbies such as drug use and alcohol abuse; (5) normal spirit and intelligence and normal communication skills such as listening, speaking, reading, and writing; and (6) volunteer to participate in this study.

Exclusion criteria are as follows: (1) with other cancers or serious basic diseases such as heart, liver, and kidney; (2) mental illness or disturbance of consciousness; (3) cases with low intelligence did not have basic listening, speaking, reading, and writing skills; (4) patients who were unable to care for themselves; (5) cases with mental illness, paranoid personality, drug addicts, and alcoholics; and (6) cases without Internet access and will not use WeChat, QQ, and other chat tools.

### 2.2. Methods

**2.2.1. Technical Route.** Figure 1 shows the technology roadmap.

**2.2.2. Intervention Scheme.** Control group scheme: routine care: from the first week of hospitalization, the responsible nurse conducted 8 consecutive health education interviews with the patients, including the following: (1) introduction and prevention of AIDS and breast cancer, (2) introduction and countermeasures of common complications of AIDS, (3) introduction of common programs for antiviral treatment of AIDS, (4) introduction of breast cancer operation plan, (5) medication guidance and common adverse drug reactions of AIDS complicated with breast cancer, (6) dietary guidance, (7) compliance education of antiviral drugs, (8) the significance and indication of perioperative prophylactic medication, and (9) the present situation and prospect of antiretroviral therapy and minimally invasive breast surgery. The WeChat group was established to keep in touch with patients and to encourage patients to continue to participate in the study. If the patient was discharged, the patient would be interviewed through WeChat voice chat, message, or phone.

Research group plan: the research group was given positive psychological intervention based on PERMA model. One phase was 3 weeks, 4 phases, a total of 12 weeks. The first three stages were intervened twice, and the last stage intervention only needed once with a total of 7 times. Every time 30~50 min, the intervention place was the breast surgery demonstration room. The intervention methods were interviews and exercises, including on-site guidance and home-based exercises. The specific contents included (1) the first time: Interviews were conducted with patients around their feelings after the illness. The patient was asked to talk about his negative thoughts and to guide the patient to think dialectically about the idea. (2) The second time is as follows: to introduce positive emotion. The patients were guided to understand and familiarize themselves with the relevant knowledge of positive emotions and to conduct preliminary exercises on positive emotions. Through the

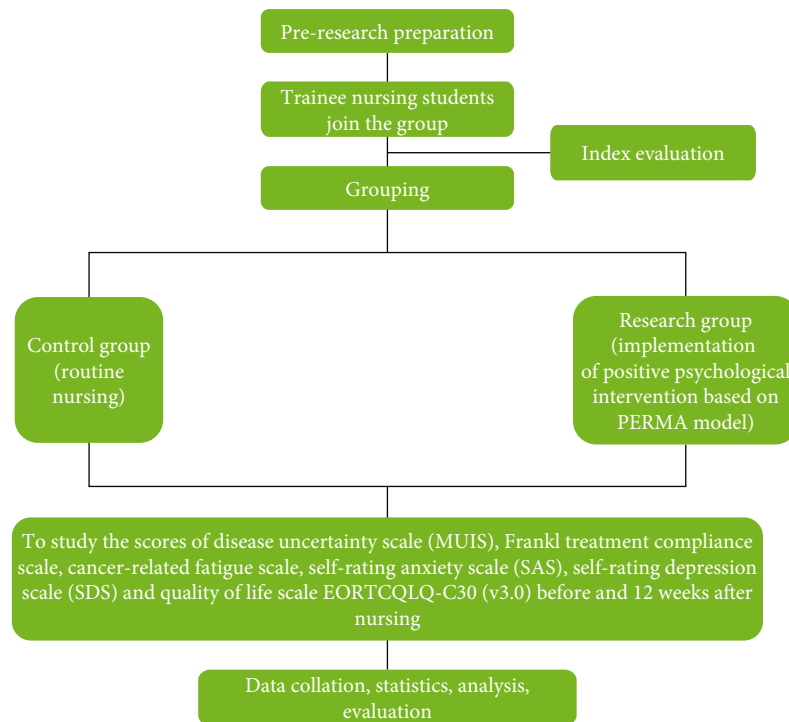


FIGURE 1: Technology roadmap.

combination of slides and videos, the famous experiments of positive psychology were introduced to patients in an easy-to-understand language. The interviews with patients would be conducted around people or things that needed to be grateful during illness. (3) The third time is as follows: to establish positive emotion. The patients were guided to cultivate positive thinking and interviewed around positive events in life. (4) The fourth time is as follows: to input. The patients were guided to understand and familiarize themselves with the relevant knowledge of input and flow experience. The patients were encouraged to conduct preliminary exercises on flow experience interview content. (5) The fifth time is as follows: relationship. The patients were guided to understand and be familiar with the relevant knowledge of interpersonal communication methods and skills. (6) The sixth time is as follows: meaning. Guided patients were asked to understand and familiarize themselves with the relevant knowledge of the meaning of life. The patients should find and determine their own meaning of life interview content through the combination of slides and videos to introduce real examples of meaningful life to patients. (7) The 7th time is as follows: goals and achievements. The patients were informed and familiarized with goals and achievements. The patients were guided to set goals that are of interest to them. The patients were presented with real-life examples of discharged patients' achievements through a combination of slides and videos.

### 2.3. Observation Index

(1) *Mishel Uncertainty in Illness Scale (MUIS)*. The total score of MUIS ranged from 320 to 160.

(2) *Frankl Treatment Compliance Scale*. The scoring criteria of Frankl compliance scale were as follows: 1: refusal, pain; 2: uncooperation, reluctance; 3: use, indifference; and 4: active cooperation and enjoyment.

(3) The scores of self-rating anxiety scale (SAS) and self-rating depression scale (SDS) were studied. Anxiety was defined as the standard score of  $SAS \geq 50$ . With the increase of the score, the degree of anxiety was more serious. The standard score of  $SDS \geq 53$  points was seen as depression.

(4) *The Score of Cancer-Related Fatigue Scale*. The scale of cancer-related fatigue includes behavioral fatigue, cognitive fatigue, physical fatigue, and emotional fatigue with a full score of 10.

(5) The EORTCQLQ-C30 (v3.0) score of the quality-of-life measurement scale was studied. The EORTCQLQ-C30 (v3.0) scale included a total of 15 evaluation dimensions and 30 items. The functional areas were included: 5 items of body, 2 items of role, 2 items of cognition, 4 items of emotion, and 2 items of social function; general health status is as follows: 1 item of general health and 1 item of quality of life. The domain (12 items for fatigue, pain, nausea, and vomiting and 1 item for health-related economic conditions) had a total of 30 items. Among them, items 29 and 30 were scored on the scale of 1-7 points, while the others were scored on the order of 1-4 points.

TABLE 1: MUIS score ( $\bar{x} \pm s$ , points).

Grouping	N	Before nursing (points)	After 12 weeks of nursing (points)
Control group	60	59.53 $\pm$ 6.14	41.15 $\pm$ 3.27*
Research group	60	59.45 $\pm$ 6.23	36.19 $\pm$ 2.04*
<i>t</i> value		0.071	9.968
<i>P</i> value		0.945	<0.01

Note: \* represented the comparison of this group before nursing and 12 weeks after nursing, and the difference was statistically significant ( $P < 0.05$ ).

TABLE 2: Frankl treatment adherence scale scores ( $\bar{x} \pm s$ , points).

Grouping	N	Before nursing	After 12 weeks of nursing
Control group	60	1.24 $\pm$ 0.31	2.69 $\pm$ 0.28*
Research group	60	1.21 $\pm$ 0.32	3.69 $\pm$ 0.08*
<i>t</i> value		0.522	26.599
<i>P</i> value		0.603	<0.01

Note: \* represented the comparison of this group before nursing and 12 weeks after nursing, and the difference was statistically significant ( $P < 0.05$ ).

TABLE 3: The score of SAS and SDS ( $\bar{x} \pm s$ , points).

Grouping	N	SAS scoring		SDS scoring	
		Before nursing	After 12 weeks of nursing	Before nursing	After 12 weeks of nursing
Control group	60	66.34 $\pm$ 5.32	57.66 $\pm$ 4.08*	72.45 $\pm$ 7.26	62.23 $\pm$ 6.14*
Research group	60	66.29 $\pm$ 5.45	50.44 $\pm$ 3.25*	72.38 $\pm$ 7.34	50.29 $\pm$ 2.03*
<i>t</i> value		0.051	10.722	0.053	14.302
<i>P</i> value		0.959	<0.01	0.958	<0.01

Note: \* represented the comparison of this group before nursing and 12 weeks after nursing, and the difference was statistically significant ( $P < 0.05$ ).

**2.4. Statistical Analysis.** The IBMSPSS24.0 software was applied for statistical analysis. The measurement data were expressed by mean  $\pm$  standard deviation. The counting data were expressed by frequency or rate. *t*-test was used when measurement data obey normal distribution, and rank sum test was used when it did not obey normal distribution.  $\chi^2$  test was used to compare the classified counting data. Repeated measurement data were analyzed by repeated measurement analysis of variance. Main effect test results were used when there was no interaction, and simple effect analysis was carried out when there was interaction.  $P < 0.05$  indicated that the difference between groups is statistically significant.

### 3. Results

**3.1. The Score of MUIS.** Before nursing, there was no significant difference in the MUIS score between the two groups ( $P > 0.05$ ). After 12 weeks of nursing, the MUIS score in the research group was lower than that in the control group, and the difference was statistically significant ( $P < 0.05$ ) (see Table 1).

**3.2. Study Frankl Scale Score.** Before nursing, there was no significant difference in the scores of Frankl scale between the two groups ( $P > 0.05$ ). After 12 weeks of nursing, the

scores of Frankl scale in the research group were higher than those in the control group, and the difference was statistically significant ( $P < 0.05$ ) (see Table 2).

**3.3. The Score of SAS and SDS.** Before nursing, the SAS and SDS scores of the two groups were not statistically significant ( $P > 0.05$ ). After 12 weeks of nursing, the SAS and SDS scores of the research group were lower than those of the control group, and the difference was statistically significant ( $P < 0.05$ ) (see Table 3).

**3.4. The Score of Cancer-Related Fatigue Scale.** Before nursing, there was no significant difference in the score of cancer-related fatigue scale between the two groups ( $P > 0.05$ ). However, the score of cancer-related fatigue scale in the research group was lower than that in the control group following 12-week nursing, and the difference was statistically significant ( $P < 0.05$ ) (see Table 4).

**3.5. Study the Score of EORTC QLQ-C30 (v3.0) Scale.** Before nursing, there was no statistical difference in the scores of EORTCQLQ-C30 (v3.0) between the groups ( $P > 0.05$ ). After 12 weeks of nursing, the EORTCQLQ-C30 (v3.0) scale-symptom domain score of the research group exhibited lower than the control group, and the difference was statistically significant ( $P < 0.05$ ). After 12 weeks of nursing, the EORTCQLQ-C30 (v3.0) scale-general health domain score

TABLE 4: The score of cancer-related fatigue scale ( $\bar{x} \pm s$ , points).

Grouping	<i>N</i>	Before nursing	After 12 weeks of nursing
Control group	60	8.59 ± 1.17	6.36 ± 0.25*
Research group	60	8.63 ± 1.14	4.02 ± 0.12*
<i>t</i> value		0.189	65.362
<i>P</i> value		0.849	<0.01

Note: \* represented the comparison of this group before nursing and 12 weeks after nursing, and the difference was statistically significant ( $P < 0.05$ ).

and functional domain score of the research group were higher than those of the control group, and the difference was statistically significant ( $P < 0.05$ ) (see Table 5).

#### 4. Discussion

Clinical studies have shown that HIV mainly invades host CD4+ cells (T cells, mononuclear macrophages, dendritic cells, etc.). It can bind to the CD4 molecule on the surface of the target cell membrane through the glycoprotein gp120 of its outer membrane. In addition, gp120-CD4 is able to bind to the chemokine receptor CXCR4 or CCR5 expressed on the surface of the target cell membrane to form a trimolecular complex of CD4-gp120-CCR5 (or CCR4), which will result in the conformational change of gp120 and exposes the masked gp41. gp41 is capable of inserting directly into the target cell membrane. The hydrophobic effect of the membrane itself mediated the fusion of the virus envelope and the cell membrane, which makes the virus enter the target cells and directly damage the immune defense and immune surveillance function [22]. CXCR4 receptor not only exists on the surface of CD4+ T cells but also highly expressed on the surface of breast cancer cells. A large number of studies have proved that the combination of breast cancer cell CXCR4 and its ligand CXCL12 can promote the proliferation of primary tumor and distant metastasis of liver, lung, and brain, which will aggravate the patient's condition and increase the difficulty of treatment [23]. Therefore, there is a certain association between AIDS breast cancer. Many patients are suffering from these two diseases at the same time.

The treatment of breast cancer has the characteristics of diversity and combination, and local treatment includes surgical resection, local radiotherapy, systemic therapy including chemotherapy, endocrine therapy, and targeted therapy [24]. AIDS patients with breast cancer are more likely to have serious mental and psychological problems such as anxiety and depression. Applying positive psychological intervention based on PERMA model to breast cancer patients can reduce the fear of cancer recurrence in breast cancer patients [25].

Due to the chronic incurability of AIDS and public panic and discrimination against AIDS, people with AIDS are more likely to suffer from many psychological problems, such as anxiety, depression, discrimination, guilt, and suicidal tendencies [26]. Shurong conducted a questionnaire survey on 321 newly diagnosed HIV infections and found that the positive rates of depressive symptoms, anxiety

symptoms, and suicidal ideation were 41.1% (132/321), 31.5% (101/321), and 27.7% (89/321), respectively [27]. Early findings have shown that AIDS patients with depression need additional psychological intervention and support from health care interventions [28]. However, the nurses in our country have a low mastery of psychological nursing knowledge, and the application of psychological nursing in AIDS patients is very rare [29]. The only psychological nursing research is only in the exploratory stage [30–34]. Thus, the current psychological care cannot meet the psychological needs of AIDS patients. Some studies have shown that the application of positive psychological intervention based on PERMA model to AIDS patients can improve the subjective well-being of AIDS patients [35]. Among AIDS patients, there is no lack of patients with low BMI and poor nutritional status. The immune function is impaired, and the adverse reactions caused by chemotherapeutic drugs are more obvious. As a result, the cancer progression of AIDS patients is faster than that of the general population, so the prognosis of AIDS patients with breast cancer is poor, which not only requires our active treatment [36, 37]. Therefore, this study introduced positive psychological intervention based on PERMA model into perioperative nursing care of AIDS patients with breast cancer.

The results of this study proved that the application value of positive psychological intervention based on PERMA model in perioperative patients with AIDS complicated with breast cancer is more significant. It is more helpful to reduce the uncertainty of disease and the degree of cancer-related fatigue. This is mainly because the incidence of anxiety and depression in AIDS is high [37]. Some studies have shown that the ability of emotion adjustment plays a very important role in controlling the occurrence and development of anxiety and depression in AIDS patients. It is also an important index to evaluate mental health [38]. In the PERMA model, clinical medical staff should include positive psychological factors such as emotion, input, interpersonal relationship, meaning, and achievement in the health guidance management system of AIDS patients with breast cancer [39, 40]. In the guidance of propaganda and education, more attention should be paid to the psychological status of patients. Furthermore, their negative emotions such as anxiety and depression should be reduced through the training of positive explanation and optimistic explanation style in the interview. It can increase the positive emotion through gratitude practice, the establishment of positive emotion file, and the improvement of interpersonal relationship by active response, so as to guide patients to express their negative

TABLE 5: EORTC QLQ-C30 (v3.0) scale score ( $\bar{x} \pm s$ , points).

Grouping	N	Symptom field		Functional area		General health field	
		Before nursing	After 12 weeks of nursing	Before nursing	After 12 weeks of nursing	Before nursing	After 12 weeks of nursing
Control group	60	36.44 ± 3.28	29.59 ± 2.32*	15.54 ± 2.09	25.39 ± 4.13*	3.15 ± 0.25	4.03 ± 0.45*
Research group	60	36.12 ± 3.34	24.36 ± 1.14*	15.65 ± 2.02	40.77 ± 5.12*	3.16 ± 0.08	7.12 ± 0.11*
t value		0.529	15.672	0.293	18.111	0.295	51.668
P value		0.598	<0.01	0.769	<0.01	0.768	<0.01

Note: \* represented the comparison of this group before nursing and 12 weeks after nursing, and the difference was statistically significant ( $P < 0.05$ ).

emotion towards the disease. Specific negative psychological aspects of the patient are identified, and counselling and thought-transformation exercises are given to help patients change their negative perceptions of the illness, reduce their uncertainty about the illness, and enhance their positive emotions and experiences. In addition, the patients are made to understand that their current negative emotions are related to misperceptions through the principles of cognitive intervention. Through the further understanding of the disease, the patients will learn to explain the current physical problems and challenges from a positive point of view, which greatly increases their confidence in resisting the disease. There are some limitations in this study. First, the sample size of this study is not large, and it is a single-center study, so bias is inevitable. In future research, we will carry out multicenter, large-sample prospective studies, or more valuable conclusions can be drawn.

In conclusion, the application value of positive psychological intervention based on PERMA model in perioperative patients with AIDS complicated with breast cancer is more significant. It is more helpful to reduce disease uncertainty and cancer-related fatigue and, in the meanwhile, to improve treatment compliance and quality of life.

## Data Availability

No data were used to support this study.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

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