

INFLUENCE OF COLOR EMOTION EXPRESSION IN PACKAGING DESIGN ON PSYCHOLOGICAL BEHAVIOR OF PATIENTS WITH DEPRESSION

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SUMMARY

Background: Depression is a group of diseases with high incidence rate, high recurrence and high suicide rate, which is characterized by low mood, slow thinking and decreased interest. It seriously affects the social function of patients. Color is the most sensitive information of human beings and the fastest reflection of visual nerve. The impact of color on human physiology and psychology is both sensitive and fast. When people observe various objects outside, the first reflection is the color pole, which is the visual information symbol that is the most sensitive to visual stimulation and the fastest response among the elements of human vision. In this paper, the rehabilitation training of packaging design based on color psychology was carried out for patients with bipolar depression, in order to improve the negative emotion of patients with bipolar depression and improve the training effect.

Subjects and methods: 140 patients with bipolar depression were randomly divided into observation group and control group, with 70 cases in each group. Among them, all subjects were between 18 and 60 years old, educated above junior high school, able to understand the contents of the scale and questionnaire. Before and after the intervention, HAMD scale, positive and negative emotion scale, insight and treatment attitude questionnaire were used to evaluate.

Results: There was no difference between the two groups before training ($P > 0.05$). After training, the scores of this group decreased significantly ($P < 0.001$), and the scores of positive and negative emotions were significantly better than those before training ($P < 0.001$). The scores of insights and treatment attitude of all subjects after training were significantly better than those before training ($P < 0.001$). After training, the score of the observation group was slightly higher than that of the control group.

Conclusions: On the basis of routine nursing of mental diseases, adopting the packaging design rehabilitation training scheme based on color psychology is beneficial to adjust or improve the emotional state of patients. Properly adjusting the cold and warm colors will help patients maintain stable emotions, reduce clinical risks and promote disease recovery.

Key words: bipolar depression - emotion management - color - mental nursing

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INTRODUCTION

Color is the loudest language of vision. It belongs to the expression of emotion and the transmission of information. It has an important impact on human survival (Yates et al. 2020). Generally, people will feel color through psychology. When adjusting the bad mood of patients with depression, they should gradually make patients realize their personal color preference and its role in personality and emotion, recognize the psychological effect brought by emotion, and adjust the color of their own activity environment and their own clothing color to achieve the purpose of improving emotion (Sindermann et al. 2020). Due to the long-term existence of patients' negative emotions, the incidence rate, disability rate and recurrence rate of patients are at a high level, and the suicide rate is much higher than that of normal people (Andrews et al. 2018). Depression is a group of diseases with high incidence rate, high recurrence and high suicide rate, which is characterized by low mood, slow thinking and decreased interest. It seriously affects the social function of patients (Baudry et al. 2019; Seagrave et al. 2021). Suicide begins with suicidal ideation, that is, there is suicidal intention. The more frequently patients have suicidal ideation, the higher the possibility of suicidal behavior (Kessler et al.

2017). Therefore, emotion management of psychological behavior of patients with depression has become an important research direction in the field of psychology. Color is the most sensitive information of human beings and the fastest reflection of visual nerve. The impact of color on human physiology and psychology is both sensitive and fast. When people observe various objects outside, the first reflection is the color pole, which is the visual information symbol that is the most sensitive to visual stimulation and the fastest response among human visual elements (Gebara et al. 2021). Attention to color accounts for about 80% of human vision, and attention to shape only accounts for about 20%. Research shows that some colors can effectively regulate the bad psychology of patients with mental diseases. With the continuous progress of society, packaging design is gradually more suitable for people's development needs. It not only reflects the respect and care for human nature in color, but also brings some improvement to people's negative emotions visually (Ma et al. 2022; Chen et al. 2021). This article will carry out rehabilitation training of packaging design based on color psychology for patients with bipolar depression, and try to improve their negative emotions and improve the training effect.

SUBJECTS AND METHODS

Study setting

140 patients with bipolar depression were randomly divided into observation group and control group, with 70 cases in each group. Among them, all subjects were aged between 18 and 60 years old, educated above junior high school, able to understand the contents of the scale and questionnaire (Cai et al. 2021). The psychological and drug treatment schemes were similar, and the score

of Hamilton Depression Scale (HAMD) was higher than 10 and lower than 17. You can fill in the scale and questionnaire normally. People with color blindness, color weakness, organic mental disorder, language communication disorder and hearing disorder are excluded. There is no significant difference in the comparison of general data between the two groups, as shown in Table 1.

Table 1. Initial data comparison

General information		Observation group	Control group	Statistical	<i>P</i>
Gender (cases)	Male	32	36	0.24	0.633
	Female	38	34		
Age (years)		32.25±9.44	31.68±9.55	0.252	0.803
Course of disease (years)		6.84±2.26	6.27±2.73	0.956	0.344
Years of Education (years)		10.76±2.49	11.16±2.27	-0.706	0.484
Spouse (person)	Have	30	34	0.231	0.632
	Nothing	40	36		
Number of hospitalizations (Times)		3.26±1.61	3.16±1.73	0.253	0.803

This study gave the observation group a package design rehabilitation training program based on color psychology, which mainly uses a special way to process the package outer box into lines and digital symbols. Patients with depression only need to paint in the color filling area of the corresponding number to complete the color processing of the package outer box, so that patients without package color design technology can also make exquisite packages. The training program is simple, controllable, interesting, rich in products, easy for patients to have a sense of achievement, and can effectively promote patients' treatment compliance. Color psychology technology uses the regulating effect of color on human physiology and psychology, which belongs to an intervention method to drive patients' emotion (Johnston et al. 2021; Cheng & Wang 2022).

Design

The control group was given the routine nursing plan for mental diseases, and the observation group was given the rehabilitation training plan based on color psychology after the routine nursing.

Control group: routine DIY digital oil painting training was given on the basis of maintaining drug treatment and routine nursing of mental diseases. The training is carried out in the entertainment room. The trained nurses guide the patients to carry out the training, distribute the painting materials, and the patients can fill in the color and paint freely, gradually increasing from 8-10 color numbers to 25 color numbers. The training is carried out three times a week, 50-60 minutes each time for 6 weeks. The whole training time is about 17h. Observation group: First, maintain drug treatment and routine nursing of mental diseases, the intervention method of color emotional expression of packaging design was adopted. The training is carried out in the entertainment room, and the trained qualified nurses

guide the patients to carry out the training. First, test the color preference of patients, test the patients, select the color according to the color preference test results, and prepare DIY digital oil painting materials, mainly landscape paintings, flowers, characters, animals and life scene paintings. Choose painting materials with warm colors of red, orange and blue (including the surrounding environment of the training venue and the color of painting materials). Blue is the preferred color of bipolar depression, which can reduce the patient's cortical arousal level and stabilize emotion. Red and orange can refresh the patient. The training was divided into groups and layers according to color preference, age, gender, education level and depression score. Painting materials assigned to the patient's preferred color during training. For patients with depression score > 15, age > 50, and years of education < 7, practice from 10 color number painting materials. At the initial stage of training (week 1-week 2), arrange works with few painting tasks and easy to complete. The main purpose of this stage is to stimulate the patient's confidence in participating in training. Young patients and female patients prefer warm color-based painting materials. Patients with high educational level or middle-aged patients shall be given painting materials with relatively calm colors of blue and green. Provide personalized painting materials according to the individual's color preference and emotional state. After the patient's condition recovers, the color of the painting materials should also be adjusted from blue and green to blue, red and orange. The number of color numbers is from less to more, from simple to complex, step by step. There are 5-10 color numbers from week 1 to week 2, 15-20 color numbers from week 3 to week 4, and 20-25 color numbers from week 5 to week 6. Train three times a week, one time from 10:00 to 11:00 on Monday, Wednesday and Friday, each training for 50-60 minutes, continuous training for 6 weeks, and the whole training time is about 17 hours.

Before and after the intervention, HAMD scale (Natcher 2019), positive and negative emotion scale (Yan et al. 2021), insight and treatment attitude questionnaire (Lang et al. 2020) were used for evaluation. Among them, HAMD scale is evaluated by analyzing the frequency of symptoms. According to the frequency of specific phenomena or symptoms, 0-4 points are given. The higher the score, the more frequent the corresponding items are, and the worse the patient's condition is. The positive and negative emotion scale is used to assess individual positive and negative emotions. The scale includes 20 items, of which 10 items reflect positive emotions and the other 10 items reflect negative emotions, all of which are rated at 1-5 levels. A high score of positive emotion indicates that the individual is energetic and in a happy emotional state. The high score of negative emotion indicates that the individual feels confused subjectively and is in a painful emotional state. The questionnaire of insight and treatment attitude consists of 11 items. The higher the score, the more complete the patient's insight and the better the treatment attitude (Ofei-Dodoo et al. 2021). The reliability calculation formula of the above scale is shown in formula (1).

$$r_{xx} = \frac{2r_{hh}}{1+r_{hh}} \quad (1)$$

In formula (1), represents the reliability estimate of the whole test, and indicates the correlation coefficient. The relevant data adopts Excel software and SPSS17.0 software for calculation and statistics (Pereira et al. 2020).

RESULTS

See Table 2 for the comparison of HAMD scale scores between the two groups. The results showed that there was no difference between the two groups before training ($P > 0.05$). After training, the scores of this group decreased significantly ($P < 0.001$). It shows that the two intervention methods can effectively improve patients' mental depression, but the effect of packaging design rehabilitation training program based on color psychology is better.

As shown in Table 3, among all subjects, the scores of positive and negative emotions after training were significantly better than those before training ($P < 0.001$). After training, the emotional scores of the two groups in the observation group were significantly better than those in the control group ($P < 0.001$). It shows that both intervention methods can significantly alleviate the positive and negative emotions of patients with depression, but the effect of rehabilitation training program based on color psychology is better.

Table 2. Compare HAMD scores before and after training

Group	Before training	After training
Observation group	13.98±2.68	8.84±1.66*
Control group	14.27±2.26	10.46±1.79*
<i>t</i>	-0.493	-3.948
<i>P</i>	0.626	0.000

Note: Intra group comparison * $P < 0.001$.

Table 3. Compare positive and negative emotions before and after training

Group	Positive emotion				Negative emotion			
	Before	After	<i>t</i>	<i>P</i>	Before	After	<i>t</i>	<i>P</i>
Observation group	11.3±1.8	15.9±3.0	-7.59	0.00	24.1±3.0	17.95±2.7	9.01	0.00
Control group	11.3±1.7	13.1±2.2	-3.68	0.00	23.8±3.8	20.3±2.1	4.77	0.00
<i>t</i>	0.07	4.39	-	-	0.39	-3.95	-	-
<i>P</i>	0.95	0.00	-	-	0.71	0.00	-	-

Table 4. Comparison results of insight and treatment attitude between the two groups before and after training

Group	Before training	After training
Observation group	12.17±2.57	15.62±1.94*
Control group	11.93±2.83	14.84±1.78*
<i>t</i>	0.374	1.547
<i>P</i>	0.713	0.130

Note: Intra group comparison * $P < 0.001$.

See Table 4 for insight and treatment attitude before and after training. It can be seen from Table 4 that the scores of insights and treatment attitude of all subjects

after training were significantly better than those before training ($P < 0.001$). After training, the score of the observation group was slightly higher than that of the

control group. The main reason is that the color mainly affects the emotion through the five senses. It plays a role in regulating the patient's emotion by bringing the

DISCUSSION

Packaging design color emotion expression intervention can improve the depressive state of patients with bipolar depression and reduce the recurrence rate. Bipolar depression is the depressive episode of bipolar disorder. Compared with monophasic depression, the clinical manifestation is more complex, the treatment is more difficult, the prognosis is worse, the risk of suicide is greater, and there is a lack of effective therapeutic drugs. Therefore, the research on non drug intervention measures for patients with bipolar depression is particularly urgent. The intervention mode of color emotional expression in packaging design is simple to operate, which can improve patients' training compliance, improve patients' cognitive functions in execution, attention and memory, and then improve patients' negative emotional state. The process of painting training involves color psychological technology, which mainly uses the characteristics of color affecting the patient's physiological activities and the changes of psychological activities such as emotion and cognitive processing in daily life, so as to adjust the patient's emotional state. Patients with different age, gender, education level, emotional state and personality characteristics have great differences in the order and degree of color preference. According to the patients' preference for color, age, education level and depression score, group and layered training were carried out, and the patients' preference for color was used to improve the training compliance and rehabilitation effect. Use the external stimulation of color to adjust the patient's emotional state. For example, use red to adjust the patient's depressed and worried mood, so as to produce a sense of excitement and joy, and use blue to adjust the patient's irritable and uneasy mood, so as to make him feel calm and comfortable. Through painting and the use of color, vent bad emotions. The results of this study show that the intervention of packaging design color emotional expression can improve the depressive state of patients and reduce the recurrence rate of disease.

Packaging design color emotion expression intervention can improve the positive emotion and reduce the negative emotion of patients with bipolar depression. Positive emotion refers to a state in which individuals are positive, optimistic, happy, good willpower and attention. Negative emotion refers to a state of anxiety, anger, anxiety, depression, fear and guilt. It is a negative emotional state. The ultimate state of negative emotion is depression. In addition to adjusting the number of color and painting materials according to age and education level, the study also adjusts the number of color and painting materials according to gender. With the progress of treatment, patients' preference for some colors increases or decreases, and patients with bipolar depression have a gradual increase

moving emotion from the subconscious. However, the patient has no obvious feeling about this, so the comparison effect between the groups is not obvious.

in their preference for blue and red. The combination of red, orange and blue adjusted to warm colors is conducive to the psychological rehabilitation of patients with depression. Red and yellow belong to the warm color system, which can stimulate cheerful, lively and positive emotions, give people warmth, inspire people's thinking and effectively alleviate negative emotions. During the training period, it is always on the premise of improving the patient's training compliance, improving the psychological state and cognitive function, adjusting the color application strategy, running the color therapy through the whole training process, completing sufficient rehabilitation training time, allowing the patient to complete the self color emotion venting through the creation of artistic works from the inside to the outside, so as to continuously strengthen the patient's positive emotion and gradually weaken the negative emotion.

Effects of color psychology on insight and treatment attitude of patients with bipolar depression. Insight refers to the cognitive ability of patients to their own mental state. Patients with complete insight can usually recognize that they are ill, know that they need treatment, and actively cooperate with doctors for treatment. The results showed that there were significant differences in the scores of insights and treatment attitude between the two groups before and after training. There was no significant difference between the scores of insights and treatment attitude between the two groups after training, which may be because: color affects emotion through people's five senses, and brings moving emotion through subconscious psychological activities, which mainly regulates the patient's emotion, so it has no obvious impact on the patient's insight. Or because the number of cases included in this study is relatively small, the training time is not long, the lack of long-term observation data and other factors, the impact of color psychological technology on patients' insight cannot be truly reflected.

CONCLUSIONS

Bipolar depression is the depressive episode of bipolar disorder. Compared with monophasic depression, the clinical manifestation is more complex, the treatment is more difficult, the prognosis is worse, the risk of suicide is greater, and there is a lack of effective therapeutic drugs. Therefore, the research on non-drug intervention measures for patients with bipolar depression is particularly urgent. On the basis of routine nursing of mental diseases, adopting the packaging design rehabilitation training scheme based on color psychology is beneficial to adjust or improve the emotional state of patients. Properly adjusting the cold and warm colors will help patients maintain stable emotions, reduce clinical risks and promote disease recovery.

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Contribution of individual authors:

Shan Dou: conception and design of the manuscript and interpretation of data, literature searches and analyses, clinical evaluations, manuscript preparation and writing the paper;

Zhen Wang: made substantial contributions to conception and design, literature searches and analyses, participated in revising the article and gave final approval of the version to be submitted.

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