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Analysis of the Application Effect of Dual-Perspective Care Mode in Patients with Magnetic Resonance Imaging Examination

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Abstract: Objectives: This paper aims to explore application effect of the dual-perspective care mode for safety and comfort needs in patients with magnetic resonance imaging (MRI) examination. *Methods:* A total of 132 patients with MRI examination who were admitted to our hospital from September 2018 to February 2020 were selected as the research objects, and they were divided into control group and intervention group by random number table method, with 66 cases in each group. Patients in the control group received routine nursing care, while patients in the intervention group received the dual-perspective nursing care. The psychological state, nursing safety quality, nursing satisfaction, and quality of life scores of the two groups were compared and analyzed. *Results:* The Self-Rating Anxiety Scale (SAS) (32.05 ± 2.63) and Self-Rating Depression Scale (SDS) (33.14 ± 4.15) of patients in the intervention group receiving dual-perspective nursing mode were lower than those in the control group, and the improvement level of psychological states such as anxiety and depression was significantly better than that in the control group, the difference was statistically significant ($P < 0.05$). Intervention group patients in early treatment of dangerous situation (3.26 ± 1.08), implementation of safety measures (3.32 ± 1.15), prevention of accidental injury (3.17 ± 0.95), and other eight nursing safety quality index scores were higher than the control group ($P < 0.05$). The nursing satisfaction of patients in the intervention group (93.94%) was significantly higher than that in the control group (75.76%), and the differences were statistically significant ($P < 0.05$). In addition, the five life quality indexes of the intervention group were higher than those of the control group, including physiological (90.51 ± 6.39), psychological (91.33 ± 5.76), and emotional (90.45 ± 5.39). *Conclusion:* The dual-perspective nursing intervention for the safety and comfort needs of patients with MRI examination can effectively improve the anxiety and depression in the diagnosis and treatment, ensure the safety and comfort of the examination process, improve patients' satisfaction with nursing, so as to ensure the effectiveness and accuracy of the examination results, which has great clinical application value.

Keywords: Magnetic resonance imaging; Dual-perspective nursing intervention; Security; Comfort; Mental state; Nursing satisfaction

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1. Introduction

Magnetic resonance imaging (MRI) is an examination technology that draws internal images of structures through electromagnetic waves generated by external gradient magnetic fields and the absorption of radiofrequency magnetic field energy by research objects. It has the advantages of high sensitivity, simple operation, and non-invasiveness. It has been widely used in the examination and diagnosis of clinical diseases [1]. However, the MRI examination is time-consuming, and the patient must keep still in a small, closed space, and the machine will generate noise during the examination. It may even stop halfway if the patient cannot cooperate well with the operation, and the image quality of the result is poor, which cannot provide a basis for the patient's diagnosis and treatment [2]. The key to solving this problem is to provide effective nursing intervention to improve the safety and comfort of the examination. The dual-perspective nursing mode focuses on safety and comfort, aiming to improve the patient's experience during the MRI examination by comprehensive nursing intervention on the patient's psychological state, examination process, etc. Therefore, the purpose of this study is to compare the changes in the psychological state of MRI subjects and the satisfaction with nursing under the routine nursing model and the dual-perspective nursing model, in order to evaluate the application effect of the dual-perspective nursing model in patients with MRI examinations, and assess its clinical significance. The study provides a guideline for future application.

2. Materials and methods

2.1. Research objects

A total of 132 patients who received MRI examinations in our hospital from September 2018 to February 2020 were selected as the research objects, and they were divided into control group and intervention group by random number table method, with 66 cases in each group. The intervention group included 35 males and 31 females, with an average age of 54.28 ± 5.24 years, there were 20 cases of head examination, 16 cases of neck examination, 10 cases of chest examination, 11 cases of abdomen examination, and 9 cases of knee joint examination. The control group included 38 male cases and 28 females. The average age of the patients was 54.26 ± 5.17 years old. There were 18 cases of head examination, 15 cases of neck examination, 12 cases of chest examination, 10 cases of abdomen examination, and 11 cases of knee joint examination.

Inclusion criteria for research subjects:

(1) Patients who plan to undergo MRI examination.
(2) Patients aged 18–80.
(3) Patients with normal cognitive function.
(4) Patients with informed consent.

Exclusion criteria for research subjects:

(1) Patients with severe organ dysfunction.
(2) Patients with heart stents, metal joints, and other metal implants, who are not suitable for MRI examination.
(3) Patients with mental dysfunction.

2.2. Method

The control group received routine nursing intervention. Firstly, the patients' information was checked, they were instructed to take out all the metal objects on their body before the examination, and they were asked whether there were steel plates, steel nails, or pacemakers in their body. The examiner should wear special clothes and shoes for the examination, inform the patient of the examination environment and the noise of the

machine, and prepare the patient psychologically [3,4].

The intervention group received dual-perspective nursing intervention, as follows.

(1) Comfort:

The first aspect is psychological care. Before the examination, the patient was informed of the precautions for the examination, the patient was allowed to be familiar with the examination environment, and watch the video of the MRI examination related operation process, and the questions raised by the patient were patiently answered, so as to improve the anxiety of the patient. Emotional comfort should be done for patients with unstable emotions and their family members, and family members should be allowed to accompany special patients (claustrophobia, elderly, and babies, etc.) [4].

The second aspect is environmental care. The examination room and waiting area were regularly cleaned, and relevant instruments and equipment were disinfected. Some simple and relaxing decorative pictures were pasted on the walls of the examination room, and the temperature and humidity of the examination room were adjusted before each examination.

The third aspect is nursing during the process. Before the examination, the patient was instructed to wear anti-noise cotton balls and earphones, and close their eyes, the changes in the body were closely observed, and the patient was instructed to position when a special part is detected.

(2) Safety:

There are three parts in the safety aspect, including before examination, during the examination, and after examination. After confirming the subject and the examination site, the patient was carefully screened for contraindications to the examination and metal objects on the body, and the patient was asked whether there was a history of drug allergy to eliminate potential safety hazards.

During the examination, the patient was instructed to keep breathing steadily and not to touch the instrument [5]. When dynamic contrast-enhanced examination is required, thick, straight, and elastic blood vessels should be selected, and the reasonable amount of contrast medium should be determined strictly based on the doctor's advice and the subject's weight, and care should be taken to ensure that the contrast medium is infused smoothly without extravasation. The care with seriously ill patients was strengthened during the examination process, and preparations for first-aid were made at any time in advance [6].

After examination, the patient was instructed to observe for half an hour before leaving without abnormalities, and drink plenty of water to promote the metabolism and excretion of the contrast medium [7].

2.3. Observation indicators

Two groups of patients were evaluated on four indicators, namely psychological state, safety quality, satisfaction, and quality of life. Mental state indicators were assessed using the Self-Rating Anxiety Scale (SAS) and the Self-Rating Depression Scale (SDS). Both SAS and SDS scales have 20 items, and the full score is 80 points. The higher the score, the more serious the degree of anxiety and depression. The safety and quality indicators were evaluated using the Safety Nursing Evaluation Scale (patient version). The scale includes 7 dimensions, and the full score for each item is 5 points. The higher the score, the higher the sense of security [8]. Nursing satisfaction index is evaluated by a self-made nursing satisfaction survey scale. There are 10 aspects in total, and the full score is 100 points, ≥ 90 points are very satisfied, 70–89 points are satisfied, ≤ 69 points are dissatisfied, total satisfaction = (very satisfied + satisfied) / total number of cases × 100%. The quality of life was evaluated using the Simple Health Scale (SF-36), with a total of 5 dimensions, and the higher the score, the

better the quality of life.

2.4. Statistical methods

SPSS22.0 software was used for statistical analysis of data. The measurement data are represented by mean ± standard deviation (SD), and the *t* test is used for comparison. The count data are represented by the composition ratio, and the x^2 test is used. The inspection level $\alpha = 0.05$.

3. Results

3.1. Comparison of mental state scores between the two groups

Before the examination, there was no significant difference in the mental state scores of the two groups of patients ($P > 0.05$). After the examination, the mental state scores of the two groups of patients were reduced ($P < 0.05$). After the examination, the scores of self-rating anxiety scale and self-rating depression scale in the intervention group were lower than those in the control group, and the difference was statistically significant ($P < 0.05$). It can be seen that the mental state of the patients in the intervention group was better than that in the control group, as shown in **Table 1**.

Table 1. Comparison of mental state scores between the two groups of patients (mean ± SD)

Group	SAS score		SDS score	
	Before examination	After examination	Before examination	After examination
Intervention group	55.85 ± 3.26	32.05 ± 2.63	58.14 ± 2.62	33.14 ± 4.15
Control group	54.74 ± 4.05	45.86 ± 6.23	58.74 ± 3.26	44.75 ± 3.68
t	1.734	-16.591	-1.165	-17.005
P	0.085	< 0.001	0.246	< 0.001

3.2. Comparison of nursing safety quality scores between the two groups

After the patients in the intervention group received the dual-perspective nursing model, the scores of various indicators of nursing safety and quality were higher than those in the control group, and the difference was statistically significant ($P < 0.05$). The results are presented in **Table 2**.

Table 2. Comparison of nursing safety quality scores between the two groups of patients (mean ± SD)

Evaluation indicator	Intervention group	Control group	*t*	*P*
Deal with dangerous situations early	4.71 ± 1.28	3.26 ± 1.08	7.034	< 0.001
Implement security measures	4.29 ± 1.25	3.32 ± 1.15	4.639	< 0.001
Prevent accidental injury	4.58 ± 0.43	3.17 ± 0.95	10.985	< 0.001
Convey safety information	4.61 ± 0.28	3.32 ± 1.05	6.644	< 0.001
Safety knowledge education	4.57 ± 0.32	3.26 ± 1.28	8.066	< 0.001
Check normalization	4.85 ± 0.14	3.36 ± 1.17	10.273	< 0.001
Awareness of self-safety management	4.76 ± 0.28	3.29 ± 1.14	10.173	< 0.001

3.3. Comparison of nursing satisfaction between the two groups

Based on **Table 3**, the nursing satisfaction of patients in the intervention group was higher than that in the control group, and the difference was statistically significant ($P < 0.05$). Therefore, the implementation of safe

and comfortable dual-perspective nursing can improve patients' satisfaction with medical services.

Table 3. Comparison of nursing satisfaction between the two groups

Group	Number of cases	Very satisfied	Satisfied	Dissatisfied	Total satisfaction (%)
Intervention group	66	48	14	4	62 (93.94%)
Control group	66	40	10	16	50 (75.76%)
x^2	8.486				
P	0.004				

3.4. Comparison of the scores of quality of life between the two groups

After receiving the dual-perspective nursing model, the scores of quality of life (QOL) of the patients in the intervention group were higher than those in the control group in terms of physiology, psychology, and emotion, and the difference was statistically significant ($P < 0.05$), as shown in **Table 4**.

Table 4. Comparison of the scores of quality of life between the two groups of patients (mean ± SD)

QOL	Intervention group (n = 66)	Control group (n = 66)	*t*	*P*
Physiological function	90.51 ± 6.39	81.42 ± 3.36	10.229	< 0.001
Psychological function	91.33 ± 5.76	80.26 ± 4.36	12.449	< 0.001
Emotional function	90.45 ± 5.39	81.43 ± 5.64	9.393	< 0.001
Social function	90.38 ± 4.46	82.63 ± 6.13	8.305	< 0.001
Physical function	89.75 ± 5.41	81.46 ± 4.49	9.579	< 0.001

4. Discussion

MRI examination is the most commonly used clinical examination method, and the accuracy of its results greatly affects the patient's disease diagnosis [9]. However, due to the time-consuming MRI examination and the small, closed examination space, it is easy to cause emotional tension in patients and affect the accuracy of examination results [10]. The implementation of effective nursing intervention is significant to ensure the validity and accuracy of MRI examination. This study explores the application effect of the dual-perspective nursing model based on safety and comfort needs in MRI subjects. The results showed that, compared with conventional care, patients who received the dual-perspective nursing model had significant improvement in four aspects: psychological state, sense of security, satisfaction with nursing care, and quality of life.

This study found that the SAS scores (32.05 ± 2.63) and SDS scores (33.14 ± 4.15) of the patients in the intervention group who received the dual-perspective nursing model were lower than those in the control group, and the improvement levels of anxiety, depression, and other mental states of patients were significantly better than those in the control group. This is consistent with Bian Xiying's study [2], which found that compared with the control group, patients who received dual-perspective nursing intervention had lower SAS and SDS scores. It can be seen that the dual-perspective nursing based on the needs of safety and comfort can effectively alleviate the anxiety and depression of MRI patients during the examination process, promote their psychological stability, and ensure the accuracy of the examination results. In actual clinical application, a dual-perspective nursing model based on safety and comfort needs should be provided for MRI patients to stabilize patients' emotions and ensure the accuracy of examination results.

In addition, compared with patients in the control group, patients in the intervention group had higher

scores on the quality of nursing care, such as early treatment of dangerous situations, implementation of safety measures, prevention of accidental injuries, communication of safety information, safety knowledge education, examination standardization, and self-safety management awareness. This is consistent with the results of other researches [2,3], suggesting that the dual-perspective nursing model based on safety and comfort needs can improve the safety and quality of MRI examinations [11]. This may be related to the fact that under the dual-perspective nursing model, nurses can implement comprehensive nursing intervention, such as carefully confirming the subject and the examination site before the examination, asking whether the patient has a history of drug allergy, etc., asking the patient to observe for half an hour before leaving, and to drink plenty of water to promote the metabolism and excretion of the contrast medium. In order to improve the safety and quality of patients during the MRI examination process, patients should be provided with full-cycle, all-round safety and quality care, so that they have a sufficient sense of security, and family members can be allowed to accompany them when necessary [12].

Studies have shown that in MRI examinations, patients receiving dual-perspective nursing mode have significantly higher nursing satisfaction than patients receiving conventional care [3], which is consistent with the results of this study. This study found that the total nursing satisfaction of patients in the intervention group (93.94%) was higher than that in the control group (75.76%). Therefore, the implementation of the dual-perspective nursing model based on safety and comfort needs can significantly improve the satisfaction of MRI subjects with nursing services, improve the compliance of patients with examination, and help the examination to proceed smoothly. In addition, this study further explored the quality of life indicators of patients after implementing the dual-perspective nursing model. The study found that the scores of the patients in the intervention group who received the dual-perspective nursing model were higher than those in the control group in the five dimensions of physiological function, psychological function, emotional function, social function, and physical function. It can be seen that the quality of life of patients receiving the dual-perspective nursing model is significantly improved compared with the control group.

In summary, the dual-perspective nursing intervention for safety and comfort needs of patients undergoing MRI examinations can effectively improve the anxiety and depression in the diagnosis and treatment of patients, improve the quality of clinical care, and ensure safety and comfort, and its clinical value is worthy of recognition.

Disclosure statement

The author declares no conflict of interest.

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