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Research Article

Effects of Dual-Perspective Nursing Intervention Based on Safety and Comfort Needs on Psychological Status and Safety Quality of MRI Patients

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Abstract: ***Objective:*** To investigate the effect of dual-perspective nursing intervention based on safety and comfort needs on the psychological status and safety quality of patients undergoing magnetic resonance imaging (MRI). ***Methods:*** A total of 100 patients who received MRI in our hospital from October 2017 to December 2019 were selected and randomly divided into two groups, 50 cases for each group. Routine nursing intervention was performed in the control group, and double-perspective nursing intervention based on safety and comfort needs in addition to routine nursing was performed in the observation group. Psychological status and examination of safety quality were observed and compared between the two groups. ***Results:*** The scores of self-rating anxiety scale (SAS) and self-rating depression scale (SDS) in the observation group were lower than those in the control group after intervention. Meanwhile, the scores of early treatment of dangerous conditions, implementation of safety measures, prevention of accidental injuries, communication of safety information, education of safety knowledge, standardized examination and awareness of self-safety management in the observation group were higher than those in the control group after intervention, and the differences were statistically significant (P<0.05). ***Conclusion:*** Dual-perspective nursing intervention based on safety and comfort needs is effective for patients undergoing MRI examination, which can improve the psychological status of patients and improve the quality of examination safety.

Keywords: Dual-perspective nursing intervention; Safety and comfort needs; Magnetic resonance imaging; Quality of examination safety

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Magnetic resonance imaging (MRI) is an imaging technique in which the internal structure of an object is mapped by studying the electromagnetic waves generated by the applied gradient magnetic field and the absorption of the energy of the radiofrequency magnetic field by the object[1]. It is widely used in the diagnosis and treatment of clinical diseases, but its examination time, accompanied by large noise, etc., will affect the diagnostic results. Whereas, the dual-perspective nursing intervention based on safety and comfort needs can improve the overall comfort and nursing security of patients[2]. In this case, this study adopted a dual-perspective nursing intervention based on safety and comfort needs to implement the intervention for patients undergoing MRI examination and observe its effect on the psychological status of patients and the quality of examination safety. The illustrations are as follows.

1 Data & Methods

1.1 General data

100 patients selected for MRI examination in our hospital between October 2017 and December 2019 were divided into two groups with random number table method, 50 cases for each group. In the control

group, there were 26 males and 24 females, aged 25-76 years, with the mean age of (45.21 ± 9.61) years old. And the locations examined included: head in 9 cases, neck in 11 cases, chest in 8 cases, abdomen in 7 cases, knee in 7 cases, and others in 8 cases. The observation group consisted of 22 males and 28 females, aged 23-74 years, with mean age of (49.42 ± 11.52) years old. And the locations examined included: head in 7 cases, neck in 10 cases, chest in 9 cases, abdomen in 8 cases, knee in 9 cases, and others in 7 cases. The difference in the general data between the two groups had no statistical significance (P>0.05), and the study was comparable. This study was reviewed by the Medical Ethics Committee.

1.2 Inclusion criteria

(1) Inclusion criteria: those with normal consciousness and communication; voluntarily signing informed consent. (2) Exclusion criteria: accompanied by claustrophobia, sudden withdrawal from the examination, heart disease, etc.

1.3 Methods

1.3.1 The control group

The control group implemented routine nursing: (1) Explain the purpose, role and significance etc. of the examination to the patients, answer the relevant questions of the patients, and provide correct guidance for the examination position of the patients. (2) Check the basic information of the subject, inform the patient to remove the metal objects carried, inquire whether there is the device steel plate, steel nail or pacemaker in their body. And if there is, it cannot be tested; (3) Instruct the subject to wear the special shoes and clothes for examination, inform the patient that they were in a relatively claustrophobic environment and there was machine noise during the examination, and guide his/her psychology.

1.3.2 The observation group

The observation group implemented a dual-perspective nursing intervention based on safety and comfort needs on the basis of the observation control group: (1) Comfort perspective nursing: The patient can be arranged to observe the whole process of the examination, inform the patient that it is necessary to close their eyes to enter the magnet and wear the noise-proof earplug. Adjust the indoor temperature and humidity, and monitor the examination process of patients, etc.The examination knowledge should be cyclically played. The room is filled with warm-colored light lamps, and the instruments and objects in the examination room should be disinfected regularly. (2) Safety perspective nursing: Strengthen the monitoring of critically ill subjects, prepare for rescue in advance, and allow the family members to accompany the examination. Thick straight and elastic blood vessels should be selected for dynamic contrast-enhanced examination. Check whether the patient had a history of allergies before medication; after the examination, inform the patient to rest for half an hour, and leave without discomfort. In case of any discomfort, immediately notify the doctor to cope with it, and inform the patient to drink plenty of water.

1.4 Evaluation indicators

(1) Psychological state: Before and after the intervention (at the end of the examination), the subjective feelings of anxiety and depression of nurses were evaluated with self-rating anxiety scale (SAS) and self-rating depression scale (SDS)[3], respectively. There are 1 to 4 points in the frequency of scale entries, indicating no, sometimes, often, always. The higher the score, the greater the degree of anxiety and depression. (2) Quality of examination safety: After the intervention, according to the research results of Mu, et al.[4], the safety nursing evaluation table suitable for our hospital (patient version) was developed, with 7 dimensions and 40 items. The total score of each dimension is 8 points, and the higher the score is, the stronger the patient's sense of security is.

1.5 Statistical methods

SPSS22.0 software was adopted for data processing, was used to represent quantitative data. independent sample t test was used between groups and paired sample t test was used within groups. P<0.05 was considered statistically significant.

2 Results

2.1 Psychological status

The SAS and SDS scores of the observation group were lower than those of the control group after intervention, and the difference was statistically significant (P<0.05) (As shown in Table 1).

Table 1. Comparison of psychological status before and after intervention between the two groups ($\bar{x} \pm s$, points)

Time	group	SAS score	SDS score
Before the intervention	Control group (n=50)	65.86±7.42	68.28±7.78
	Observation group (n=50)	63.63±6.89	66.67±6.82
	t	1.557	1.100
	P	0.123	0.274
After the intervention	Control group (n=50)	52.21±5.24a	55.37±6.25a
	Observation group (n=50)	32.37±6.66a	35.72±5.52a
	t	16.555	16.663
	P	0.000	0.000

Note: Compared with that before intervention in the same group, [a]P<0.05

2.2 Quality of examination safety

The scores of early treatment of dangerous conditions, implementation of safety measures, prevention of accidental injuries, communication of safety information, education of safety knowledge, standardized examination and awareness of self-safety management in the observation group were higher than those in the control group after intervention, and the differences were statistically significant (P<0.05) (As shown in Table 2).

Table 2. Comparison of safety and quality after intervention between the two groups ($\bar{x} \pm s$, scores)

Indicators	The control group (n=50)	The observation group (n=50)	t	P
Early treatment of dangerous conditions	3.24±1.03	4.82±1.38	6.488	0.000
Implementation of safety measures	3.26±1.27	5.34±1.39	7.812	0.000
Prevention of accidental injuries	3.28±1.34	4.62±1.02	5.627	0.000
Communication of safety information	3.68±1.49	4.96±1.58	4.168	0.000
Education of safety knowledge	3.26±1.19	4.82±1.78	5.152	0.000
Standardized examination	3.78±2.01	6.04±1.05	7.047	0.000
Awareness of self-safety management	2.94±1.21	4.34±1.06	6.154	0.000

3 Discussion

Clinically, MRI examination takes a long time, and the subject is limited to a relatively narrow space and cannot move the body at will[5]. At the same time, there will be a loud voice during the operation of the machine, and the patient will be in a more obvious state of discomfort. Due to anxiety, pressure and a strong sense of suffocation, etc., the patient may have significant shortness of breath, and the body may be involuntary convulsions, etc. These problems may lead to motion artifacts that may affect the quality of the image. Meanwhile, there may be complications such as intrusive metal injury, claustrophobia, hearing impairment, burns, contrast agent allergy, etc. during the examination, which may easily result in examination failure and cause unnecessary harm to patients[6,7]. Therefore, it is particularly important to provide patients MRI examinations with high-quality nursing services with both safety and comfort.

In this study, the control group was implemented routine nursing, and the observation group was given dual-perspective nursing based on safety and comfort needs on the basis of the control group. The results showed that the SAS and SDS scores of the observation group after intervention was lower than those of the control group, and the safety quality indicator scores were higher than those of the control group, indicating that the implementation of dual-perspective nursing intervention based on safety and comfort needs for patients undergoing MRI examination had better effect, which could improve the psychological status of patients and improve the safety and quality of examination. Routine nursing intervention has achieved certain nursing effects through a series of nursing, but the nursing staff only pay attention to the use of nursing care, and the lack of attention to the patient's psychological, physical, and social comfort requirements and other aspects, resulting in patients' lower examination comfort[8]. In the safety perspective nursing, nurses actively attach great importance to the detailed intervention of MRI examination. They would check the basic information of the patient before the examination, strictly ask the patient whether there are steel plates, steel nails, and IUD in the patient's body and inform the patient to remove the metal objects carried;

During the inspection, the nurse would prohibit the patient from moving, avoid the burn caused by the contact between the patient's body and the equipment conductor, or avoid the motion artifact, so as to improve the safety quality of the examination.

In summary, the implementation of dual-perspective nursing intervention based on safety and comfort needs can regulate the psychological status of patients undergoing MRI examination and improve the quality of examination safety.

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