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# Application of Individualized Music Nursing in Percutaneous Vertebroplasty of Elderly Patients

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**Abstract:** Since to the nursing problems existing in percutaneous vertebroplasty (PVP) for elderly patients, the effect of individualized music nursing during the PVP operation was summarized and analyzed. 80 cases of PVP patients over 60 years old were randomly divided into the experimental group and the control group. In the experimental group, PVP patients were treated with individualized music nursing, but the control group was treated with the conventional surgical environment. Patients' music background were compared between the two groups. The preoperative and intraoperative anxiety scores of patients based on the State Anxiety Questionnaire (S-AI) were analyzed in two groups. And coordination between doctor and patients during the surgery were also evaluated. Results showed that there was no significant difference in the music background between the two groups ( $P > 0.05$ ). In addition, there was no significant difference in preoperative anxiety scores between the two groups ( $P > 0.05$ ), but there were significant differences in the intraoperative anxiety scores between the two groups ( $P < 0.05$ ). Furthermore, patients treated with individualized music nursing had better surgical cooperation than the control group ( $P < 0.05$ ), and the satisfaction rate of doctors (82.5%) was higher than the control group (47.5%). In conclusion, the application of individualized music nursing in PVP surgery for elderly patients could reduce the patients' anxiety and facilitate collaboration between doctors and patients during operation.

**Keywords:** Music Nursing, Elderly Patients, Individualized, PVP, Surgery

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## 1. Introduction

Osteoporosis is increasingly being recognised as a growing problem, because of the rapidly increasing size of the elderly population [1, 2]. In particular, China has the largest aged population in the world, as the population aged  $\geq 60$  years will reach 400 million (approximately 30% of the total population) by 2050 and osteoporotic vertebral compression fractures seriously affect the quality of life of the patients [3]. Since 1987, France's Galibert reported the application of percutaneous vertebroplasty (PVP) for the treatment of cervical vertebral hemangioma [4], PVP was widely used in clinical practice and began to be applied to vertebral compression fracture [5]. PVP is performed under local anesthesia. It has the advantages of small trauma, rapid pain relief, quick effect and small physiological interference. However, the patients with PVP are awake and sensitive to

various stimuli. Patients tend to feel nervous, worry and fear, easily lead to high blood pressure, fast heart rate and quick breathing frequency [5]. Even extreme words and actions can affect the quality of operation. In view of the nursing problems existing in the PVP operation for the elderly, the individualized music nursing during the PVP operation in the First Affiliated Hospital of Jinan University from January 2017 to December 2017 was summarized and analyzed, and the influence of the patient's tension and operation cooperation, so as to provide the theoretical basis for the clinical application of personalized music nursing.

## 2. Materials and Methods

### 2.1. Research Objects

From January 2017 to December 2017 in the First Affiliated Hospital of Jinan University, 80 patients containing 27 men

and 63 women with average age 76.75 were treated with PVP operation under local anesthesia. The patients were randomly divided into the experimental group and the control group (40 cases each group). The inclusion criteria for the study were: patients over 60 years old who accepted PVP surgery agreed to participate in the study, express subjective feelings correctly,

and hearing was normal. Patients with mental system disease and hearing impairment were excluded. The patients whose education, living environment, surgery experience and situation of hypertension were very similar in both groups (specific data in Table 1).

**Table 1.** Comparison of general data between the two groups (case).

General data		Control group(40)	Experimental group(40)	T/x <sup>2</sup> value	P value
Age (Y)		76.95±7.48	76.55±9.74	0.20	0.85
Sex	Female	28	25	0.50	0.64
	Male	12	15		
Level of education (high school)	Yes	38	38	0.00	1.00
	No	2	2		
Living environment	Rural	7	5	0.39	0.38
	City	33	35		
Surgery experience	Yes	14	17	0.47	0.65
	No	26	23		
Hypertension	Yes	13	14	0.06	1.00
	No	27	26		

**2.2. Research Methods**

**2.2.1. Construction of Music Library**

One day before surgery, the visiting nurses visited the patients using the personalized music background questionnaire, which includes music preferences, listening music habits, frequency and music training. According to the questionnaire, the music library was built, mainly including music, folk songs, pop music and traditional music.

**2.2.2. Personalized Music Nursing**

During the operation, the patients in the control group were given routine nursing care and kept quiet. But in the personalized music nursing experiment group, the selected music was appreciated by patients during operation after they entered the operation room.

In order to avoid the differences in medical technology, the patient's preoperative personalized music background assessment and the construction of the music library re completed by the same team in the department of orthopedics. The operation of two groups patients were performed by the same surgeon.

**2.2.3. Determination Index**

The State Anxiety Questionnaire (S-AI) compiled by Spielberger was used to evaluate the state of anxiety under stress<sup>[1]</sup>. The patient's anxiety level was immediately assessed at the operation room. The S-AI was evaluated again after 30

minutes.

The operation room circuit nurse observed the coordination of two groups of patients during the operation: (A) complain of respiratory discomfort during the operation; (B) required additional local anesthetics; (C) continued to inquire whether the operation was done; (D) intravenous sedation; (E) required doctors to stop the operation. After the operation, the satisfaction of the surgeons to the patients was investigated.

**2.3. Statistical Analysis**

T test is used for metrological data and chi-square test is used for counting data. Statistical analysis was performed using SPSS 17.0.

**3. Results**

**3.1. Patients' Music Background**

There was no significant difference between the two groups of the music background ( $P > 0.05$ ). The two groups of elderly patients preferred to enjoy light music, Cantonese songs and folk songs. Few people liked to listen to Beijing opera and popular songs. Most of patients had the habit of listening to music every day, and only a few patients were trained on music. The patients' music background was very similar in both groups (specific data in Table 2).

**Table 2.** Music background investigation in two groups (case).

Music background		Control group	Experimental group	x <sup>2</sup> value	P value
Types of music	Light music	16 (40%)	12 (30%)	3.35	0.50
	Cantonese songs	5 (12.5%)	8 (20%)		
	Folk song	8 (20%)	12 (30%)		
	Popular song	6 (15%)	6 (15%)		
	Beijing Opera	5 (12.5%)	2 (5%)		
Frequency of listening music	1-3 times /day	16 (40%)	17 (42.5%)	0.35	0.84
	1-2times /week	16 (40%)	17 (42.5%)		
	Rarely	8 (20%)	6 (15%)		
Music training	Yes	7 (17.5%)	6 (15%)	0.09	1.00
	No	33 (82.5%)	34 (85%)		

### 3.2. Anxiety Score

The preoperative anxiety score of the experimental group was  $47.13 \pm 2.21$ , and the control group was  $47.68 \pm 1.87$ . There was no significant difference between the two groups before surgery ( $P > 0.05$ ). However, the intraoperative anxiety score in the experimental group was lower than the control group ( $P < 0.05$ ), and the specific data is in Table 3.

Table 3. Anxiety scores of the two groups.

Group	Case (n)	Control group	Experimental group	T value	P value
Preoperative	40	$47.68 \pm 1.87$	$47.13 \pm 2.21$	1.38	0.18
Intraoperative	40	$47.38 \pm 2.79$	$44.90 \pm 2.58$	3.78	0.01

### 3.3. Coordination During the Surgery

In the experimental group, the patient's attention was distracted by the music nursing during the operation, so that patients in experimental group were better matched than the control group during the surgery ( $P < 0.05$ ). Respiratory discomfort occurred during the operation in experimental group, and it was very similar in both groups. In addition, some patients request for additional local anesthetics, venous assisted sedative and keep asking if the operation was done or not, but there were more patients in the control group than in the experimental group. Furthermore, a patient in control group ask the doctor to stop the operation. The doctor's satisfaction was 47.5% in the control group, but the doctor's satisfaction in the experimental group was 82.5% (Table 4). Therefore, the control group was poorer matched during the surgery than the experimental group ( $P < 0.05$ ).

Table 4. Coordination of the two groups during operation (Case).

Situation of surgery	Control group	Experimental group
1. Respiratory discomfort	4 (10%)	3 (7.5%)
2. Request for additional local anesthetics	6 (15%)	2 (5%)
3. Keep asking if the operation was done or not	5 (12.5%)	1 (2.5%)
4. Venous assisted sedative	5 (12.5%)	1 (2.5%)
5. Ask the doctor to stop the operation	1 (2.5%)	0 (0%)
6. Physician satisfaction	19 (47.5%)	33 (82.5%)
$\chi^2$ value	12.25	
P value	0.03	

## 4. Discussion

### 4.1. Individualized Music Nursing According to Patients' Preference for Music

Playing music in operation room is a humanized service [6]. It is easy to perform and low in cost, but it often receives unexpected results. The results in table 2 showed that two groups of elderly patients prefer to enjoy light music and Cantonese songs and folk songs, but popular songs are not popular. At the same time, the previous study showed that the patient's love of music through the cerebral cortex assessment and cognition, will produce pleasure, thus reducing the bad

mood in the operation [7].

### 4.2. Individualized Music Nursing to Alleviate Anxiety and Fear in Elderly Patients

Under local anesthesia, the patient is awake, usually worry about the effect of anesthesia, fear of surgical pain, and easily produce nervousness, anxiety and fear [8]. The patient is sensitive to external stimuli, such as various instruments including electric drills, hammers, chisels and scissors, which often result in excessive tension and high blood pressure, over speed of heart rate and shortness of breath, so that it will probably affect the normal operation process and effect of the operation. In this study, results in table 3 showed that the anxiety of the experimental group was significantly decreased after the individualized music nursing, which may be related to the appreciation of the music that the patients enjoyed during the operation. Appreciating music during surgery can divert attention and dispel nervousness, so as to maintain a good psychological and physiological state for patients [8].

### 4.3. Individualized Music Nursing Benefit Elderly Patients during PVP Surgery

PVP surgery requires the patient to cooperate well with the surgeon to complete the operation successfully. The coordination degree of the experimental group was better than the control group. The patient's satisfaction with the control group was only 47.5% during the operation. The patient was afraid of the pain and can't bear the surgical position. During the operation, many patients could not effectively cooperate with the operation because of extreme fear and continuously required to add local anesthetics. In the experimental group, the satisfaction of the surgeon was 82.5%. The anxiety and tension of the patients were easily relieved by the individualized music nursing, and the patients were better equipped with the doctor to complete the operation. Furthermore, people can only concentrate on one thing at a certain time, and the more attention they focus on the activities they engage in, the more effective it is to relieve pain [9].

Because the elderly often merge a variety of chronic diseases, and heart and lung function may have different degrees of decline, the operation requires the patient to maintain a sober state and ideal state of communication. The PVP surgery was under local anesthesia, so patients were awake during the surgery [10]. However unfamiliar operation environment can cause the patient's anxiety. Application of individualized music nursing during the operation can reduce or even eliminate the tension of the elderly patients. Therefore, it is suggested that individualized music nursing should be one of the psychological nursing measures during the operation and be beneficial to elderly patients.

## 5. Conclusion

The application of individualized music nursing in PVP surgery for elderly patients could reduce the patients' anxiety

and facilitate collaboration between doctors and patients during operation, so that it is beneficial to elderly patients who had PVP surgery.

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