Perioperative holistic care more significantly reduces levels of anxiety and depression of pituitary tumor patients versus conventional care

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Abstract
To compare the effect of perioperative holistic care versus conventional care on the levels of anxiety and depression of pituitary tumor patients at a single tertiary care center in China.

We enrolled 100 patients who underwent transnaso-sphenoidal microsurgical resection of pituitary tumor at our institution between January 2017 and December 2017. The patients were assigned to the conventional care group (n=50) and the holistic care group by the order of admission. Patients were evaluated by staff nurses at admission and upon discharge from the hospital using the self-rating anxiety scale (SAS), and the self-rating depression scale (SDS). QoL was assessed using EORTC QLQ-C30.

The 2 groups were comparable in the demographic and baseline variables including baseline SDS and SAS scores (P > .05). A significantly greater reduction in SAS score was observed in the holistic care group versus the conventional care group (−19.14% vs −11.60%; P < .05). Moreover, we observed a significantly greater reduction in SDS score in the holistic care group versus the conventional care group (−40.4% vs −18.79%; P < .05). The QoL functional domain scores at discharge were significantly higher in the holistic care group than the conventional care group (P < .05).

Perioperative holistic care significantly alleviates the levels of anxiety and depression and improves QoL of pituitary adenoma patients.

Abbreviations: QoL = quality of life, SAS = self-rating anxiety scale, SDS = self-rating depression scale.

Keywords: anxiety, depression, holistic care, pituitary adenoma, quality of life quality

1. Introduction
Pituitary tumor is a common intracerebral tumor and has an incidence of 1 per 10,000 persons. It accounts for 10% to 15% of intracerebral neoplasms and has a predilection for young adults.[1] Transnaso-sphenoidal microsurgery for pituitary tumor resection is minimally invasive, safe, and has a very few complications and as a result has been widely applied clinically.[2] However, pituitary tumor patients may experience affective disorders before surgery because of severe endocrine disturbance and compressive effects of the tumor such as obesity, acromegaly, infertility, amenorrhea, male impotence, and visual field changes, which greatly impact on the psychosomatic health of pituitary tumor patients.[3]

Ongoing disease-related symptoms, affective disorders such as anxiety and depression and treatment-related complications can also affect the quality of life (QoL) of pituitary tumor patients. Recently, increasing attention has been paid to the psychometric status of pituitary tumor patients. Holistic nursing care has recently emerged as a novel approach to provide team-based care for patients. The holistic care mode requires the team work of physicians, nurses and patients based on the novel management concept that is “patient-centered, need-initiated, and satisfaction-oriented”, emphasizing cooperation among team members and patients to achieve the goal of treatment.[4] Conventional care confines itself to simple implementation of physician orders and does not pay sufficient attention to psychosomatic health and QoL of patients.[1] In the current prospective study, we compared the effect of perioperative holistic care versus conventional care on the levels of anxiety and depression of pituitary tumor patients at a single tertiary care center in China.

2. Patients and methods
2.1. The study population
This study was approved by The Institutional Review Board of Ethics Committee of The First Affiliated Hospital, Anhui Medical University. We enrolled 100 patients who underwent transnasosphenoidal microsurgical resection of pituitary tumor at the Department of Neurosurgery, the First Affiliated Hospital, Anhui Medical University, Hefei, Anhui, China between January 2017 and December 2017. Major inclusion criteria were: patients were...
diagnosed with pituitary tumor; patients understood and were cooperative with the study instructions. Major exclusion criteria were: patients were mentally disoriented or had mental illnesses; patients had other severe diseases; patients had other factors that interfered with their psychological evaluation.

The study protocol was approved by the local ethics committee at the authors’ affiliated institution. Patients or their legal surrogates provided written informed consent to the study.

2.2. Study interventions

The patients were assigned to the conventional care group (n = 50) and the holistic care group (n = 50) by the order of admission. The conventional care group received conventional care by staff nurses including assistance for patients to complete laboratory studies, education on possible complications, diet guideline, and health education. Meanwhile, the holistic care group received the following interventions apart from conventional care: holistic care by an integrated team consisting of head nurse, treatment team leader, attending physician and staff nurses; attending physician educated patients and their family members on the disease and treatment plan while staff nurses provided information on preoperative preparation, dietary precautions and preventive measures, so that patients gained an overall picture of the entire treatment and nursing care process, became familiar with treatment plan and hospital environment and free of fear; nurses observed the entire surgical procedure to have a detailed understanding of the intraoperative condition of the patient, which guided subsequent nursing care; physicians and nurses attended ward rounds and reported patient’s condition together, and jointly developed individualized treatment plan, and nursing care measures; physicians and nurses jointly developed individualized health education pathways for patients, and provided psychological support, and for patients with particularly high psychological stress, psychologists were asked to provide intervention and guidance; physicians and nurses jointly developed a personalized diet plan, and if necessary, a dietitian was consulted to ensure the nutritional needs of patients; to promote early recovery of the patient, physicians and nurses jointly developed a rehabilitation plan by using the rapid rehabilitation concept and based on the patient’s condition; the ward maintained a relative humidity of 60% to 70% to increase patient comfort; patients were given a health education prescription upon discharge, and received comprehensive and continuous guidance via a social media WeChat group or via telephone call.

2.3. Psychometric evaluation

Patients were evaluated by staff nurses at admission and upon discharge from the hospital using the self-rating anxiety scale (SAS), and the self-rating depression scale (SDS). Each scale consists of a self-completion questionnaire with 20 items rating four common characteristics of depression or anxiety. The questionnaires have been validated for use in Chinese populations. Scores for each question range from 1 to 4. The scores were counted and multiplied by 1.25 to reach a standardized score, according to the scale instructions. Higher scores represent more severe anxiety or depression. In accordance with the Chinese norm, patients were considered to have anxiety with a score of 50 or more on the SAS, and depression with a score of more than 53 on the SDS.

2.4. QoL assessment

QoL was assessed by staff nurses at admission and upon discharge from the hospital with the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30). The Chinese version of the EORTC QLQ-C30 has been validated in Chinese populations. The scale has 30 questions and 5 functional domains (physical, role, cognitive, emotional, and social), 3 symptom domains (fatigue, pain, and nausea and vomiting), one global health, and QoL scale, and 6 symptom items (dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties). The scores of the items range from 0 to 100. Higher scores represent higher QoL for the functional domains and the global health scale and worse health for the symptom scales and items.

2.5. Survey of satisfaction with nursing care

A nursing care satisfaction questionnaire was distributed to the patients upon discharge from the hospital. The questionnaire includes 24 items and the scores of the items range from 0 to 100. A score of 91 to 100 indicates full satisfaction; a score of 76 to 90 indicates satisfaction; a score of 61 to 75 indicates partial satisfaction and score less than 60 represents dissatisfaction.

2.6. Study outcomes

The primary outcome was the level of anxiety and depression as assessed by the SAS and SDS, respectively. The secondary outcomes were QoL and nursing care satisfaction by patients.

2.7. Statistical analysis

Statistical analysis was performed using SPSS17.0 software (SPSS Inc., Chicago, IL). Quantitative data were expressed as mean ± SD. Student’s t test was used for comparison between groups. Enumeration data were expressed by relative numbers. Chi-square test was used for comparison between groups. P < .05 was statistically significant difference.

3. Results

3.1. Patient demographic and baseline characteristics

Around 50 pituitary tumor patients were assigned to the conventional care group and 50 patients were assigned to the holistic care group. Patient demographic and baseline characteristics are shown in Table 1. The mean age of the study population was 36.3 ± 12.3 and 61% of the patients were male. The 2 groups were comparable in the demographic and baseline variables (P > .05).

3.2. Primary outcome

The mean baseline SDS score was comparable between the 2 groups (holistic care: 59.4 ± 8.8 vs conventional care: 56.4 ± 6.9; P > .05) (Table 2). In addition, the mean baseline SAS score was comparable between the 2 groups (holistic care: 60.1 ± 3.4 vs conventional care: 61.2 ± 2.9; P > .05). A significantly greater reduction in SAS score was observed in the holistic care group versus the conventional care group (−19.14% vs −11.60%; P < .05). Moreover, we also observed a significantly greater reduction in SDS score in the holistic care group versus the conventional care group (−40.4% vs −18.79%, P < .05) (Table 2).
3.3. Secondary outcomes

3.3.1. QoL. There was no statistically significant difference in baseline QoL scores between the 2 groups (P > .05) (Table 3). The QoL functional domain scores at discharge were significantly higher in the holistic care group than the conventional care group (P < .05). Furthermore, except financial difficulties, the holistic care group had significantly lower QoL scores in the symptom domains than the conventional care group (P < .05).

3.3.2. Nursing care satisfaction scores. A significantly higher proportion (52%) of patients in the holistic care group were fully satisfied with nursing care than that (26%) of the conventional care group.

### Table 1

| Variables                  | The holistic care group | The conventional care group | \( \chi^2/t \) | \( P \) |
|----------------------------|-------------------------|-----------------------------|---------------|-------|
| No.                        | 50                      | 50                          |               |       |
| Male gender, n (%)         | 34 (68)                 | 27 (54)                     | 1.513         | .219  |
| Mean age, years            | 36.3 ± 12.3             | 37.1 ± 13.0                 | 0.46          | .628  |
| Education                  |                         |                             |               |       |
| Primary school or under    | 18                      | 19                          | 0.171         | .918  |
| Middle school              | 21                      | 19                          |               |       |
| High school and above      | 11                      | 12                          |               |       |
| Marriage, n (%)            | 39 (78)                 | 37 (74)                     | 0.055         | .815  |
| Tumor size, n (%)          | 18 (36)                 | 16 (32)                     | 0.184         | .912  |
| Microadenoma               | 18 (36)                 | 16 (32)                     |               |       |
| Macroadenoma               | 21 (42)                 | 22 (44)                     |               |       |
| Giant adenoma              | 11 (22)                 | 12 (24)                     |               |       |

### Table 2

| Groups                      | No. | Baseline     | At discharge | SAS | Baseline     | At discharge | SDS | Baseline     | At discharge |
|-----------------------------|-----|--------------|--------------|-----|--------------|--------------|-----|--------------|--------------|
| Holistic care               | 50  | 60.1 ± 3.4   | 48.6 ± 3.8   |     | 59.4 ± 8.8   | 35.4 ± 5.2   |     |              |              |
| Conventional care           | 50  | 61.2 ± 2.9   | 54.1 ± 3.7   |     | 56.4 ± 6.9   | 45.8 ± 6.3   |     |              |              |
| \( T \)                     | .750| .038         | .764         | .009|              |              |     |              |              |

### Table 3

| Items                       | Baseline     | At discharge | \( t \) | \( P \) | Baseline     | At discharge | \( t \) | \( P \) |
|-----------------------------|--------------|--------------|---------|--------|--------------|--------------|---------|--------|
| Function domains            |              |              |         |        |              |              |         |        |
| Overall health              | 76.9 ± 15.1  | 77.8 ± 13.6  | .096    | .618   | 62.8 ± 14.2  | 54.1 ± 13.2  | 3.08    | .006   |
| Emotion function            | 81.2 ± 15.2  | 82.4 ± 11.5  | .248    | .768   | 65.3 ± 13.4  | 63.6 ± 12.3  | 3.045   | .003   |
| Somatic function            | 65.8 ± 12.9  | 66.3 ± 11.8  | .256    | .768   | 55.3 ± 12.8  | 54.3 ± 12.6  | 2.086   | .08   |
| Role function               | 61.2 ± 15.8  | 56.9 ± 14.2  | 1.798   | .097   | 55.8 ± 15.4  | 49.8 ± 11.8  | 3.68    | .003   |
| Cognition function          | 64.7 ± 11.8  | 63.6 ± 7.9   | 1.268   | .203   | 60.8 ± 8.6   | 54.1 ± 7.6  | 6.798   | <.001  |
| Social function             | 52.1 ± 10.9  | 54.9 ± 8.9   | 1.378   | .159   | 43.9 ± 11.8  | 39.1 ± 9.9  | 3.198   | .001   |
| Symptom domains             |              |              |         |        |              |              |         |        |
| Fatigue                     | 32.9 ± 18.1  | 34.1 ± 15.6  | .458    | .636   | 40.9 ± 14.6  | 43.1 ± 15.9  | 3.21    | .001   |
| Pain                        | 27.8 ± 15.8  | 30.6 ± 17.8  | 1.286   | .189   | 36.2 ± 15.5  | 41.2 ± 18.8  | 2.69    | .003   |
| Insomnia                    | 41.3 ± 24.9  | 40.4 ± 23.8  | .0429   | .659   | 50.6 ± 19.8  | 58.1 ± 21.6  | 2.216   | .028   |
| Constipation                | 45.9 ± 22.7  | 47.6 ± 24.5  | .6628   | .517   | 55.8 ± 22.4  | 62.7 ± 24.6  | 1.846   | .031   |
| Diarrhea                    | 34.9 ± 16.8  | 37.9 ± 19.1  | .786    | .428   | 39.9 ± 11.3  | 44.2 ± 10.8  | 3.210   | .001   |
| Anorexia/vomiting           | 16.4 ± 18.6  | 17.1 ± 18.5  | 1.038   | .899   | 54.8 ± 10.6  | 59.9 ± 12.3  | 3.139   | .002   |
| Dyspnea                     | 47.1 ± 20.9  | 48.4 ± 19.8  | .556    | .567   | 54.1 ± 19.2  | 59.8 ± 11.9  | 3.096   | .002   |
| Loss of appetite            | 43.8 ± 19.7  | 44.9 ± 18.8  | .978    | .336   | 51.1 ± 19.9  | 58.3 ± 21.9  | 2.218   | .028   |
| Financial hardship          | 48.6 ± 38.9  | 47.9 ± 26.8  | .334    | .781   | 58.4 ± 29.8  | 57.9 ± 27.8  | 0.156   | .882   |
4. Discussion

The current study investigated the effects of holistic care on anxiety, depression, and QoL of pituitary tumor patients and found that compared to conventional care, holistic care significantly alleviated anxiety and depression of these patients and also markedly improved their QoL.

Affective disorders such as depression may be present in pituitary tumor patients before surgery.\(^{[16]}\) D’Angelo et al.\(^{[13]}\) showed that pituitary tumor patients also frequently experienced affective disorders and may develop a depressive state post-surgery. Our baseline psychometric assessment of the study population showed that depression and anxiety were present in the patients. Severe endocrine changes and visual disturbance may induced psychosomatic reduce the levels of anxiety and depression in pituitary tumor patients, especially those with anterior pituitary tumors.\(^{[12]}\)

Consistently, we also observed significant decline in the levels of anxiety and depression in our patients following surgery. We further showed that holistic care could result in significantly lower levels of anxiety and depression versus conventional care, indicating that perioperative holistic care could effectively reduce affective disorders such as anxiety and depression. In our holistic approach, we documented changes in SDS and SAS scores before and after surgery in pituitary tumor patients, and the psychometric assessment allowed us to assess the effect of our holistic care on affective disorders in the patients. We demonstrated that our holistic care approach significantly improved psychometric performance of our patients, indicating that holistic care could reduce the severity of anxiety and depression in pituitary tumor patients. Bunevicius\(^{[14]}\) found that emotional stability and openness of pituitary tumor patients are associated with lower depressive/anxiety symptom severity of low-grade/benign brain tumor patients. The holistic care approach could improve patient outcome by providing psychological support and attending to affective needs of pituitary tumor patients.

Pituitary tumor patients experience significantly lower levels of physiological functions, emotions, and social interaction and have increased levels of fatigue, and sleep problems.\(^{[15]}\) Xie and Zhang\(^{[16]}\) showed that depression also compromises the QoL of pituitary tumor patients. The 2 groups of patients had comparable baseline QoL scores. Following surgery, patients receiving holistic care exhibited markedly improvement in QoL versus conventional care. These findings indicate that apart from alleviating depression and anxiety, holistic care could also improve QoL of pituitary tumor patients. Moreover, we demonstrated that patients receiving holistic care had a significantly higher rate of full satisfaction than patients receiving conventional care, which is consistent with previous findings.

The study has several limitations. First, this is a single center study conducted at a tertiary care institution. The findings may not be applicable to other care settings. Furthermore, the study population is small. In addition, the study did not analyze clinical variables that contribute to the improvement in SDS and SAS scores. Pituitary Macroadenoma patients were found to have markedly reduced QoL following surgical treatment.\(^{[17]}\) Therefore, studies with a larger population size and longer duration of follow-up are required to confirm our findings.

In conclusion, our findings demonstrate that perioperative holistic care significantly alleviates the levels of anxiety and depression and improves QoL of pituitary adenoma patients.

## Author contributions

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### Table 4
Nursing care satisfaction scores of the study population, N (%).

| Groups            | No. | Full satisfaction | Satisfaction | Partial satisfaction | Dissatisfaction |
|-------------------|-----|-------------------|--------------|----------------------|----------------|
| Holistic care     | 50  | 26 (52.0)         | 22 (44.0)    | 2 (4.0)              | 0 (0.0)        |
| Conventional care | 50  | 13 (26.0)         | 27 (54.0)    | 8 (16.0)             | 2 (4.0)        |
| Chi-square test   |     |                   | 10.44        |                      |                |
| P                 |     |                   | .015         |                      |                |

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