

Study on the correlation between postoperative mental flexibility, negative emotions, and quality of life in patients with thyroid cancer

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Background: In recent years, the global incidence of thyroid cancer has increased year by year. The purpose of this study is to investigate the post-surgical psychological flexibility and negative feelings of patients with thyroid cancer and their association with quality of life.

Methods: A total of 82 patients with thyroid cancer were selected. The study utilized the Acceptance and Action Questionnaire 2nd edition (AAQ-II), the Cognitive Fusion Questionnaire (CFQ), and the Meaning in Life Questionnaire-the Presence of Meaning (MLQ-P). By quantifying psychological flexibility, we assessed the patient's experiential avoidance, cognitive fusion, and sense of life meaning. The Self-rating Depression Scale (SDS) and the Self-rating Anxiety Scale (SAS) were employed to evaluate depression and anxiety, respectively. Quality of life was evaluated with the Functional Assessment of Cancer Therapy-General (FACT-G).

Results: The mean AAQ-II, CFQ, MLQ-P, SAS, and SDS scores were 20.1±9.2, 27.5±10.7, 23.0±5.7, 47.7±13.3, and 43.3±12.8, respectively. In total, 24.4% and 45.1% of patients had depression and anxiety to some extent, respectively. The AAQ-II and CFQ scores were positively correlated with the SDS and SAS scores, and negatively correlated with the FACT-G score. The MLQ-P score was inversely correlated with the SDS and SAS scores, and was positively correlated with the FACT-G score. Logistic regression analysis indicated that the AAQ-II, CFQ, and MLQ-P were independent risk factors for quality of life.

Conclusions: Depression and anxiety are ubiquitous in patients with thyroid cancer following surgery. The psychological flexibility of patients is significantly negatively correlated with depression and anxiety and can dramatically influence quality of life.

Keywords: Thyroid cancer; psychological flexibility; negative feeling; quality of life

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Introduction

With the increasing prevalence of ultrasound screening, the incidence rate of thyroid cancer has increased significantly in China. Although most thyroid cancers (especially papillary thyroid cancer) have a good prognosis, a cancer diagnosis is a severe adverse life event. It leads to substantial psychological stress, thus significantly affecting the quality of life of patients. Studies have shown that about 33–48% of cancer patients have different degrees of anxiety, depression, and other negative emotions (1). Psychological flexibility refers to the ability of individuals with independent consciousness to change certain behaviors

based on personal values. Corresponding with psychological activity is psychological rigidity, which mainly includes empirical avoidance, cognitive integration, and lack of personal perspective. A previous study illustrated that the stronger the psychological rigidity of patients, the lower the psychological activity (2). McAteer et al. found that the psychological activity of patients with prostate cancer significantly affects the anxiety and quality of life of patients (3). However, there is no systematic study on the relationship between psychological activity and negative emotions, as well as quality of life in patients with thyroid cancer. The purpose of this study is to explore the relationship between psychological activity, negative emotions, and the quality of life of patients with thyroid cancer after surgery. This study provides a potential method for effectively improving negative emotions and patients' quality of life. We present the following article in accordance with the STROBE reporting checklist (available at https://dx.doi.org/10.21037/gs-21-424).

Methods

General information

A total of 82 patients with thyroid cancer after surgery in our department from October 2019 to December 2020 were selected as the research subjects. The inclusion criteria were as follows: (I) thyroid cancer was confirmed by pathology; (II) patients were 18 years old or above; (III) there was no history of mental illness in the past or at the time of inclusion; (IV) patients could understand the content of this study and agreed to participate in the study. The exclusion criteria were as follows: (I) rejection of participants; (II) the patient had severe organ dysfunction; (III) the patient had other malignant tumors. The questionnaire was distributed to patients for them to fill in by themselves. For patients with lower education level or older age, the researchers gave relevant explanations when filling out the questionnaire by themselves. A total of 82 questionnaires were distributed, and the response rate was 100%. All procedures performed in this study involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013). Informed consent was taken from all the patients. We will fully protect the privacy of patients, and the data collected will only be used for research purposes. However, the study was designed in 2019, and ethical review was not required for observational research at that time, as long as the patient signed an informed consent form.

Data collection

A self-designed questionnaire was used to collect the general information of patients, including age, gender, education level, marital status, duration of disease, medical payment (self-paid *vs.* medical insurance).

Assessment of psychological flexibility

The Acceptance and Action Questionnaire 2nd Edition (AAQ-II), the Cognitive Fusion Questionnaire (CFQ), and the Meaning in Life Questionnaire - the Presence of Meaning (MLQ-P) can quantify the main components of psychological rigidity. By exploring experiential avoidance, cognitive fusion, cognitive integration, and lack of value, we evaluated the psychological flexibility of patients (4). There are 7 items in the AAQ-II, and the score of each item is 1–7. The higher the score, the higher the degree of empirical avoidance. There are 9 items in the CFQ, and each item has 1–7 points. The higher the score, the higher the degree of cognitive integration. There are 5 items in the MLQ-P. The higher the score, the stronger the sense of meaning. Evaluating the degree of psychological stiffness of patients can reflect the psychological flexibility of patients.

Negative emotion assessment

The Self-rating Depression Scale (SDS) and the Self-rating Anxiety Scale (SAS) were used to quantify the degree of depression and anxiety, respectively. Each scale contains 20 items. Each item is 1–4 points, the score is multiplied by 1.25, and the integer of the result is used as the standardized score of depression and anxiety. The higher the total score, the more severe the depression or anxiety.

Quality of life assessment

The Functional Assessment of Cancer Therapy - General (FACT-G) was used to evaluate quality of life (5). The scale can evaluate 4 dimensions of quality of life: physiological status (7 items, total score 28), social/family status (7 items, total score 28), emotional status (6 items, total score 24), and functional status (7 items, total score 28).

Statistical analysis

SPSS 22.0 was used for statistical analysis. Continuous normally distributed data were expressed as mean \pm SD, and

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Table 1 General information of participating patients

Variables	Count
Age (years)	37.9±10.3
Sex, n (%)	
Male	46 (56.1)
Female	36 (43.9)
Course of the disease	25.4±8.6
Degree of education, n (%)	
Senior high school and below	41 (50.0)
Undergraduate and above	41 (50.0)
Payment method, n (%)	
Covered by medical insurance	70 (85.4)
Paid by themselves	12 (14.6)
Marital status, n (%)	
Unmarried	27 (32.9)
Married	48 (58.5)
Divorced or widowed	7 (8.6)

 Table 2 Mental activity, anxiety, and depression scores of participating patients

Tests	AAQ-II	CFQ	MLQ-P	SAS	SDS
Score	20.1±9.2	27.5±10.7	23.0±5.7	47.7±13.3	43.3±12.8

AAQ-II, Acceptance and Action Questionnaire 2nd edition; CFQ, Cognitive Fusion Questionnaire; MLQ-P, Meaning in Life Questionnaire-the Presence of Meaning; SAS, Self-rating Anxiety Scale; SDS, Self-rating Depression Scale.

count data were expressed as percentages or rates. Pearson correlation was utilized to calculate the correlation between psychological flexibility score and anxiety, depression, and quality of life. The risk factors of negative emotion and quality of life were identified by regression analysis. The corresponding odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. Bilateral P<0.05 indicated that the difference was statistically significant.

Results

General information of patients

As shown in *Table 1*, the average age of the 82 patients was 37.9 ± 10.3 years old. Males accounted for 56.1%, while

Status	Items	Maximum	Minimum	Average
Physiological status	7	28	9	21.3±5.1
Social/family status	7	28	10	20.1±5.2
Emotional status	6	24	8	18.7±3.3
Functional status	7	28	12	20.5±3.4
Quality of life (FACT-G)	27	106	49	80.6±16.3

FACT-G, Functional Assessment of Cancer Therapy-General.

females accounted for 42.9%. The average course of the disease was 25.4 ± 8.6 months. Among the patients, 85.4% of them were paid by medical insurance and 58.5% were married.

Psychological flexibility and negative emotion scores of patients

As shown in *Table 2*, the AAQ-II, CFQ, MLQ-P, SAS, and SDS scores of participating patients were 20.1 \pm 9.2, 27.5 \pm 10.7, 23.0 \pm 5.7, 47.7 \pm 13.3, and 43.3 \pm 12.8, respectively. Among them, 62 (75.6%), 16 (19.5%), 3 (3.7%), and 1 (1.2%) patient had no, mild, moderate, and severe depression, respectively. Additionally, 45 (54.9%), 25 (30.5%), 7 (8.5%), and 5 (6.1%) patients had no, mild, moderate, and severe anxiety, respectively.

Quality of life in patients

As shown in *Table 3*, the total score of patients' quality of life was 80.61 ± 16.3 . The scores of each dimension from high to low were physiological status (21.3 ± 5.1), functional status (20.5 ± 3.4), social/family status (20.1 ± 5.2), and emotional status (18.7 ± 3.3) points.

Correlation between psychological flexibility, negative emotions, and quality of life

As shown in *Table 4*, patients' experiential avoidance and cognitive integration were significantly positively correlated with anxiety and depression. In contrast, the sense of meaning of life was significantly negatively correlated with anxiety and depression. Quality of life was negatively associated with experiential avoidance and cognitive integration, positively correlated with the sense of life meaning, and negatively correlated with anxiety and depression.

Regression analysis of patients' quality of life and psychological flexibility

According to the average quality of life (80.6), the patients were divided into 2 groups: high quality of life group and

Table 4 Pearson correlation analysis among psychologicalflexibility, negative emotion, and quality of life (n=82, R value)

Variables	AAQ-II	CFQ	MLQ-P	SAS	SDS	FACT-G
AAQ-II	-	-	-	-	-	-
CFQ	0.47***	-	-	-	-	-
MLQ-P	-0.32**	-0.25*	-	-	-	-
SAS	0.29*	0.30*	-0.23*	-	-	-
SDS	0.31**	0.25*	-0.27*	0.22*	-	-
FACT-G	-0.34**	-0.30**	0.59***	-0.47***	-0.35**	-

AAQ-II, Acceptance and Action Questionnaire 2nd edition; CFQ, Cognitive Fusion Questionnaire; MLQ-P, Meaning in Life Questionnaire-the Presence of Meaning; SAS, Self-rating Anxiety Scale; SDS, Self-rating Depression Scale; FACT-G, Functional Assessment of Cancer Therapy-General. *, P<0.05; **, P<0.01; ***, P<0.001. poor quality of life group. The univariate comparison between the 2 groups is shown in *Table 5*. There were significant differences in the scores of the AAQ-II, CFQ, and MLQ-P between the high quality of life group and the low quality of life group (all P<0.001). Binary logistic regression analysis showed that AAQ-II (OR =1.11, 95% CI: 1.00–1.22, P=0.03), CFQ (OR =1.10, 95% CI 1.01–1.21, P=0.02), and MLQ-P (OR =0.70, 95% CI 0.58–0.84, P<0.001) were risk factors for quality of life.

Discussion

This study suggests that 24.4% and 45.1% of patients with thyroid cancer have different degrees of depression and anxiety, respectively. Patients' psychological flexibility is significantly related to anxiety and depression, and it is a risk factor affecting patients' quality of life.

Hayes *et al.* first proposed psychological activity in the process of establishing acceptance and commitment therapy (6). Psychological flexibility is an essential part of individual mental health. Many studies have shown that poor psychological flexibility is related to the onset of

Table 5 Regression analysis of the quality of life and psychological flexibility of patients

Variables	High life quality (n=41)	Low life quality (n=41)	Statistical	P value
Age (year)	38.9±10.2	36.9±10.6	0.87	0.39
Sex (male/female)	20/21	26/15	1.78	0.27
Course of the disease (months)	24.9±7.5	25.8±9.6	-0.47	0.64
Degree of education, n (%)			0.98	0.32
Senior high school or above	18 (43.9)	23 (56.1)		
Undergraduate or above	23 (56.1)	18 (43.9)		
Payment method, n (%)			3.51	0.12
Covered by medical insurance	32 (78.0)	38 (92.7)		
Paid by themselves	9 (22.0)	3 (7.3)		
Marital status, n (%)			1.41	0.49
Unmarried	14 (34.1)	13 (31.7)		
Married	25 (61.0)	23 (56.1)		
Divorced/widowed	2 (4.9)	5 (12.2)		
AAQ-II	15.1±7.0	25.0±8.5	-5.76	<0.001
CFQ	22.1±9.4	33.0±9.0	-5.36	<0.001
MLQ-P	26.3±5.3	19.6±3.9	6.52	<0.001

AAQ-II, Acceptance and Action Questionnaire 2nd edition; CFQ, Cognitive Fusion Questionnaire; MLQ-P, Meaning in Life Questionnairethe Presence of Meaning. many mental disorders. For example, Shepherd *et al.* found that patients with facial damage have poor psychological flexibility and are more inclined to the values of escaping and lacking (7). Psychological flexibility significantly affects the anxiety, depression, and other negative emotions of cancer patients. For example, a study of 122 breast cancer patients found that more than half of the patients had negative emotions. The empirical avoidance of patients was significantly related to anxiety, depression, and generalized affective disorder (8).

This study evaluated patients' psychological flexibility through empirical avoidance, cognitive integration, and lack of value. Experiential avoidance primarily refers to the form and frequency of an individual's attempt to change an unpleasant or disgusting experience. Empirical avoidance has been proven to be directly related to postoperative emotional disorder in patients with breast cancer (9). Brown et al. suggested that empirical avoidance may be a potential mechanism of chronic pain in cancer patients with emotional disorders (10). Cognitive fusion refers to the confusion of an individual's thoughts and actual events. In other words, the patient does not correctly distinguish between the "idea" and the actual situation. Sense of life significance/value refers to the positive attitude of patients towards life. Jim et al. reported that positive or negative values to treat breast cancer after surgery can predict the life attitude of patients 2 years later (11).

Consistent with previous reports, 24.4% and 45.1% of patients with thyroid cancer had different degrees of depression and anxiety, respectively. A survey of 118 patients with thyroid cancer showed that 43.3% of them had anxiety or depression (12). Another study of 136 patients with thyroid cancer showed that 62.5% and 17.9% of the patients had anxiety and depression, respectively (13).

In this study, patients' psychological flexibility was significantly correlated with anxiety and depression. According to Hayes' theory, when patients try to control their anxiety, they will inevitably think of fear and cause a series of discomforts. Cognitive fusion can bring patients into their own "wishful thinking" and then trigger anxiety. Improving patients' sense or significance of life value is helpful for improving the depression of cancer patients (14).

The quality of life of patients with thyroid cancer after surgery is reduced, and is affected by patients' psychological flexibility. A British survey suggested that the quality of life of patients with thyroid cancer was lower than the regional norm (15). Studies found that although thyroid cancer has a good prognosis, the quality of life of patients is still significantly lower than that of the general population. With the passage of time, the emotional function, fatigue, pain, and other symptoms of patients will be improved (16). Some clinical trials suggest that psychological flexibility is related to quality of life and well-being (17), which is consistent with the findings of this study.

Following psychological counseling for psychological flexibility may help to improve the life of patients. For example, doctors explain the knowledge of thyroid cancer to patients and help them establish a correct view of the disease. In addition, doctors can explain the prognosis of thyroid cancer to patients with examples and help them eliminate psychological pressure. During the follow-up, the problems will be treated in time.

In conclusion, this study suggests that patients with thyroid cancer generally have different degrees of anxiety and depression, and other negative emotions. Patients' psychological flexibility was negatively correlated with anxiety and depression, and affected their quality of life. Therefore, in the process of diagnosis, treatment, and follow-up, attention should be paid to patients' psychological flexibility and corresponding psychological counseling should be provided, which is helpful for improving the quality of life of patients.

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Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://dx.doi. org/10.21037/gs-21-424

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://dx.doi. org/10.21037/gs-21-424). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study involving human participants were

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in accordance with the Declaration of Helsinki (as revised in 2013). Informed consent was taken from all the patients. We will fully protect the privacy of patients, and the data collected will only be used for research purposes. However, the study was designed in 2019, and ethical review was not required for observational research at that time, as long as the patient signed an informed consent form.

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