

Yimaer Wufuer¹
 Kamile Adilaimu²
 Aersilan Bogela¹
 Sailikebieke Daerhan³
 Shuo Han¹
 Chao Deng¹
 Yan Wang¹
 Munira Ahmat¹
 Huguo Wang^{1,*}

Effect of Preoperative Psychological Support on Self-Efficacy and Anxiety Levels in Patients After Total Thyroidectomy

¹Department of Vascular and Thyroid Surgery, The First Affiliated Hospital of Xinjiang Medical University, 830011 Urumqi, Xinjiang, China

²Department of Hematology, The Second Affiliated Hospital of Xinjiang Medical University, 830063 Urumqi, Xinjiang, China

³The First Ward, General Surgery Department, The Sixth People's Hospital of Xinjiang Uygur Autonomous Region, 830000 Urumqi, Xinjiang, China

Abstract

Background: This study aimed to examine the association between preoperative psychological support and postoperative outcomes in patients undergoing total thyroidectomy.

Methods: A retrospective study was conducted on 120 patients who underwent total thyroidectomy at the First Affiliated Hospital of Xinjiang Medical University between January 2023 and December 2025. According to their actual preoperative nursing plan documented in the medical records, patients were divided into two groups. The conventional treatment group received standard clinical treatment, while the psychological support group received additional unstructured preoperative psychological counselling in addition to routine treatment. Outcomes included self-efficacy (Strategies Used by People to Promote Health scale), psychological resilience (Chinese version of the Connor-Davidson Resilience Scale [CD-RISC]), anxiety level (Self-Rating Anxiety Scale), postoperative pain (Numerical Rating Scale), and health literacy (Chinese version of the All Aspects of Health Literacy Scale).

Results: On the fifth postoperative day, the self-efficacy scores (positive attitude, self-decision-making and self-stress reduction) and psychological resilience (opti-

mism, perseverance and self-improvement) were all higher in the psychological support group than in the conventional treatment group ($p < 0.05$). There were no significant differences in anxiety or pain scores between the two groups at baseline ($p > 0.05$). On the fifth postoperative day, anxiety and pain levels had decreased, with the psychological support group experiencing lower levels (46.91 ± 3.46 and 1.28 ± 0.33 , respectively) than in the conventional treatment group (49.41 ± 5.08 and 1.92 ± 0.51 , respectively) ($p < 0.05$). The complication rate in the psychological support group was 6.67%, which was lower than in the conventional treatment group ($p < 0.05$). However, this difference should be interpreted with caution, because multiple surgical factors may influence postoperative complications. There were no significant differences in health literacy or total scores between the two groups at baseline ($p > 0.05$). On the fifth postoperative day, the health literacy score in the psychological support group was higher than in the conventional treatment group ($p < 0.05$).

Conclusions: This retrospective study suggests that preoperative psychological support was associated with more favourable postoperative outcomes in patients undergoing total thyroidectomy. However, given the non-randomised, retrospective design of this study, these findings should be interpreted as exploratory and require confirmation through prospective randomised controlled trials.

Keywords

total thyroidectomy; preoperative psychological support; self-efficacy; anxiety disorder

Submitted: 28 May 2026 Revised: 16 August 2026 Accepted: 22 August 2026 Online First: 23 September 2026

*Corresponding author details: Huguo Wang, Department of Vascular and Thyroid Surgery, The First Affiliated Hospital of Xinjiang Medical University, 830011 Urumqi, Xinjiang, China. Email: xjxjwhg@163.com

Introduction

Total thyroidectomy is a common surgical procedure for treating malignant thyroid tumours and thyroid adenomas. As a radical treatment, it can effectively control the disease. However, due to various factors such as surgical trauma, stimulation during surgery, and postoperative complications, as well as loss of thyroid function [1,2], patients may experience significant stress reactions before surgery, such as preoperative sleep disorders, anxiety, decreased self-efficacy and poor psychological resilience [3]. In addition, a lack of knowledge about the disease and self-care knowledge may even affect the smooth progress of the surgery and be detrimental to the prognosis [4]. Moreover, severe preoperative adverse reactions can also increase cortisol levels by activating the hypothalamic-pituitary-adrenal axis, suppressing immune function and increasing the incidence of postoperative complications [5]. Preoperative psychological support forms part of the preoperative medical process. Its purpose is to alleviate patients' fear of surgery and enable them to face the disease in a positive psychological state [6]. However, the conventional approach in the past has focused on the physiological preparation and treatment of patients before surgery and has paid little attention to preoperative psychological support. Most medical staff only provide emotional support through conventional health education, which is ineffective [7]. This study aimed to explore the association between preoperative psychological support and patient outcomes after total thyroidectomy.

Materials and Methods

Study Design and Participants

A total of 120 patients who underwent total thyroidectomy at the First Affiliated Hospital of Xinjiang Medical University between January 2023 and December 2025 were selected as the subjects of the study. Patient data were analysed retrospectively and patients were divided into two groups according to their previous treatment methods. This grouping was retrospective, without prospective allocation of patients. The study was approved by the Ethics Committee of the First Affiliated Hospital of Xinjiang Medical University (approval number: 251015-16). The study complies with the requirements of the Helsinki Declaration and all research participants provided informed consent.

Inclusion criteria: (1) Patients were clinically diagnosed with indications for total thyroidectomy; (2) The surgery was successfully performed at our hospital, after which the patients were discharged after recovery; (3) Patients had normal cognitive, visual, auditory and language

functions; (4) Informed consent was given; (5) The patient was undergoing thyroid-related surgery for the first time; (6) The patient's vital signs were stable before the operation; (7) The medical record clearly indicates whether the patient received targeted psychological support in addition to routine care prior to surgery.

Exclusion criteria: (1) Severe liver or kidney dysfunction, infection, diseases of the blood system or immune systems; (2) History of thyroid surgery; (3) Mental abnormality or intellectual disability; (4) Transfer to another hospital midway through the study. Fig. 1 illustrates the detailed screening and enrolment process for the 120 included patients.

This study is a retrospective analysis of medical records. All data were sourced from the electronic medical record system, independently extracted and double-checked by two researchers. The extraction rules for each variable are as follows: Age is calculated based on the date of birth and the date of surgery, determining the age of one year on the day of surgery; gender, education level, and marital status are extracted from the homepage of admission records; diagnosis is classified based on the discharge pathology report, which is considered the gold standard; body mass index (BMI) is calculated based on the height and weight recorded at the first admission; Vital signs were measured for the first time in the morning on the day after admission; Grouping is based on whether the preoperative nursing records include content relating to unconventional psychological support, such as "psychological counseling" or "relaxation training". After reviewing the original medical records, it was confirmed that no key variables were missing for patients with missing or ambiguous data. This study did not implement any prospective intervention measures on patients.

Methods

The conventional treatment group received routine clinical care [8]: Preoperatively, patients were assisted in completing various relevant examinations, including complete blood counts and coagulation function tests. Their physical and mental condition was also carefully assessed. Various therapeutic medications were administered. The surgical procedure and its purpose were explained to patients in detail, helping them to understand the potential risks during the operation and emphasising past successful cases and extensive treatment experience. Patients were taught how to perform breathing and neck exercises. Postoperatively, vital signs (blood pressure and heart rate) were closely monitored and various treatments were provided.

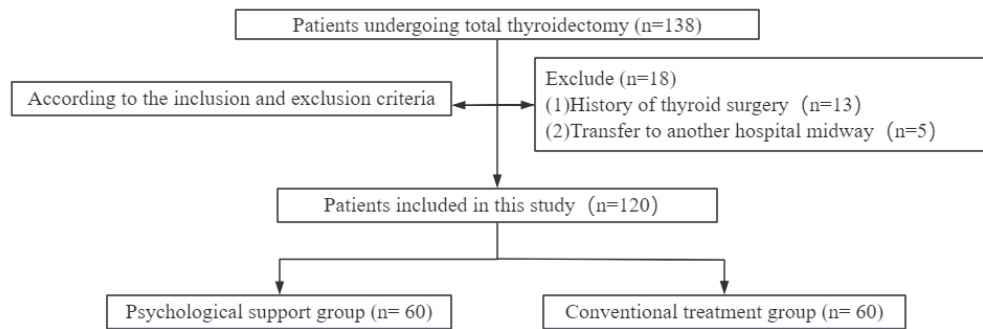


Fig. 1. Process flowchart for 120 patients undergoing total thyroidectomy.

Psychological support group [7]: According to the medical records, this group of patients received additional preoperative psychological support measures in addition to routine treatment. These measures were not implemented uniformly by this study, but were provided selectively by clinical medical staff based on the patient's situation. The specific contents are summarised as follows: (1) Psychological state assessment: the patient underwent the Self-Rating Anxiety Scale (SAS) [9] assessment after admission, as recorded in the nursing notes. The results of this assessment were used to assist the nursing staff determine the patient's level of anxiety, so that they could adjust the comfort measures more effectively in subsequent communications. According to the different levels of anxiety, the medical records record the corresponding frequency and duration of psychological counselling content, reflecting the characteristics of individualised nursing. (2) Implementation of psychological support: (a) Information support: Explain the necessity and expected effects of the surgery to patients and their families. Guide breathing and posture training. Some patients' nursing records mention encouragement through sharing successful case studies. (b) Emotional support: For patients with high anxiety scores, emotional counselling, active listening and encouraging communication provided by nurses were recorded. (c) Relaxation guidance: Some nursing records mention guiding patients to engage in deep breathing, muscle relaxation, or music therapy to relieve tension. (d) Family guidance: For patients with high anxiety scores, medical advice or nursing records may include instructions such as advising family members to strengthen companionship and provide more encouragement. (3) Support intensity and frequency: According to medical records, the intensity and frequency of psychological support are related to the patient's anxiety level. Patients with mild anxiety received brief education and encouragement, those with moderate anxiety received longer periods of emotional counselling, and those with

high anxious recorded prolonged daily companionship and psychological comfort.

In this retrospective study, patients were not included in the psychological support group based on an objective threshold set by an individual, but rather by the clinical nursing team after comprehensive judgement. The decision-making criteria usually included obvious emotional reactions exhibited by the patient after admission, psychological support requested by the patient or family members, and the SAS score measured on the day after admission. The SAS score is just one piece of the reference information and the final decision depends more on the nurse's subjective clinical evaluation of the patient's overall emotional state and the patient's own willingness to seek help. This multifactor, individualised decision-making model reduces the risk of selection bias caused by using the SAS score as the sole grouping driver to some extent. However, it should be acknowledged that these psychological support measures form part of daily clinical work and that the specific implementation duration, frequency of contact and detailed communication content are not systematically or completely recorded in the medical records. The frequency, duration and specific content of support may vary among different patients.

Observation Indicators

(1) Baseline period (second day of hospitalisation): Assess the patient's self-efficacy, psychological resilience, anxiety levels and health literacy. The second day of admission was selected as the baseline assessment time point because patients on the day of admission often experience significant psychological stress immediately upon admission due to handling procedures, adapting to the environment and gaining an initial understanding of their diagnosis.

sis. At this time, transient factors can easily affect the assessment results, making it difficult to truly reflect the patient's stable state. After the first day of routine nursing care and environmental adaptation, patient's emotions tend to stabilise, making it a more suitable time to evaluate their true baseline level before receiving psychological support or routine care.

(2) The early postoperative period (4 and 24 hours): Assess patients' pain level. These two time points were chosen because the peak of postoperative acute pain and the stress response often occur between 48 and 72 hours after surgery. Although the situation has stabilised by the 5th day after surgery, differences between the two groups in the measures received can still be observed.

(3) Post-treatment evaluation period (postoperative day 5): Re-evaluate the patient's self-efficacy, psychological resilience, anxiety level and health literacy. The 5th day after surgery is used as the main evaluation time point for the following reasons: firstly, patients who undergo total thyroidectomy usually meet the discharge criteria between the 4th and 5th days after surgery. Secondly, this time point can be used to evaluate the overall effect of the psychological support received by patients during their hospitalisation, and to provide a baseline reference for their rehabilitation after discharge.

(4) In addition, record any complications that occur during the patient's hospitalisation period (from the date of surgery to discharge).

Self-Efficacy

The Cancer Strategies Used by People to Promote Health (SUPPH) [10,11] was used for the assessment. Consisting of 28 items, it covers three dimensions: positive attitude (15 items, 15–75 points), self-decision-making (3 items, 3–15 points) and self-stress reduction (10 items, 10–50 points). A 5-point Likert scale was used, with a total score ranging from 28 to 140 points. A higher score indicates a higher level of self-efficacy. Cronbach's α coefficient was 0.849, and the validity was 0.810.

Psychological Resilience

The Chinese version of the Connor-Davidson Resilience Scale was used for the evaluation [12], which includes three dimensions: optimism (4 items, 0–16 points), resilience (13 items, 0–52 points) and strength (8 items, 0–32 points). Each item was scored from 0 to 4 points, with a total score ranging from 0 to 100 points. A higher

score indicates better psychological resilience. Cronbach's α coefficient was 0.910, and the validity was 0.940.

Anxiety and Pain

Anxiety was assessed using the 20-item SAS [9]. Each item was rated on a four-point scale, with raw scores ranging from 20 to 80 points. The standardised score was calculated as raw score $\times$ 1.25 (rounded to the nearest integer), for a maximum score of 100 points. Cronbach's α coefficient was 0.820, and the validity was 0.780.

The Numerical Rating Scale (NRS) was also used [13], and patients marked their pain scores from 0 to 10 according to their own experience of pain. A higher score indicates more severe pain. Cronbach's α coefficient was 0.760, and the validity was 0.700.

Complications

Record any complications that occur during the patient's treatment, including nausea, vomiting, dizziness, headaches, laryngeal oedema, incision infections, hoarseness, etc., and the total complication rate should be calculated [14].

Health Literacy Score

The All Aspects of Health Literacy Scale (AAHLS assessment) [15] was used. Consisting of 11 items across 3 dimensions, it measures information literacy (4 items, 4–12 points), communication literacy (3 items, 3–9 points) and application literacy (4 items, 4–12 points). All items are scored using a three-level method, with a total score of 11–33 points. A higher the score indicates higher health literacy. Cronbach's α coefficient was 0.811, and the validity was 0.943.

Data Processing

The data were analysed using SPSS 27.0 software (IBM Corp., Armonk, NY, USA). The quantitative data (self-efficacy, psychological resilience, pain level, anxiety level and health literacy) follows a normal distribution (expressed as $\bar{x} \pm s$), and an independent sample *t*-test was used for intergroup comparison. Meanwhile, the effect size (Cohen's *d*) and its 95% confidence interval (CI) were calculated. A paired sample *t*-test was used for an intra-group comparison before and after. The categorical data [incidence of complications *n* (%)] were analysed using χ^2 test

Table 1. Baseline data of the two groups of patients [n (%)].

Baseline characteristics	Category	Psychological support group (n = 60)	Conventional treatment group (n = 60)	t/χ^2	p
Gender	Male	29 (48.33)	22 (36.67)	1.671	0.196
	Female	31 (51.67)	38 (63.33)		
Age (years)		51.02 ± 5.11	52.13 ± 4.96	1.207	0.230
Clinical diagnosis	Thyroid adenoma	11 (18.33)	12 (20.00)	0.306	0.858
	Malignant thyroid tumours	40 (66.67)	41 (68.33)		
	Other	9 (15.00)	7 (11.67)		
Educational level	High school or above	21 (35.00)	24 (40.00)	0.320	0.572
	Junior high school or below	39 (65.00)	36 (60.00)		
Marital status	Married	52 (86.67)	54 (90.00)	0.323	0.570
	Single	8 (13.33)	6 (10.00)		
BMI (kg/m ²)		22.63 ± 2.02	22.39 ± 2.25	-0.615	0.540
Systolic blood pressure (mmHg)		125.63 ± 12.05	127.01 ± 14.31	0.571	0.569
Diastolic blood pressure (mmHg)		82.63 ± 5.36	83.02 ± 5.75	0.384	0.701
Heart rate (beats/min)		86.67 ± 8.16	87.01 ± 9.12	0.215	0.830

BMI, body mass index.

or Fisher's exact test, and the odds ratio (OR) and its 95% CI were calculated using χ^2 test. All data analyses were conducted using a two-tailed test, with $p < 0.05$ being considered statistically significant.

Results

Baseline Data

This study preliminarily screened 138 patients who underwent total thyroidectomy at the First Affiliated Hospital of Xinjiang Medical University between January 2023 and December 2025. According to the inclusion and exclusion criteria, 18 cases were excluded: 13 patients had a history of thyroid surgery, and 5 were transferred to other hospitals midway through the study. A total of 120 patients were ultimately included in the analysis: 60 in the psychological support group and 60 in the conventional treatment group. The patient inclusion process diagram is shown in Fig. 1. No statistically significant difference was found in baseline characteristics between the two groups ($p > 0.05$). See Table 1 for details.

Self-Efficacy

There were no significant differences in any dimension of self-efficacy between the two groups at baseline ($p > 0.05$). However, on the fifth postoperative day, the psychological support group had higher scores for all dimensions of self-efficacy (positive attitude, self-decision-making and self-stress reduction) than the conventional

treatment group ($p < 0.05$), as shown in Table 2.

Psychological Resilience at Baseline and Day 5 Post-Surgery

There was no significant difference in psychological resilience scores between the two groups at baseline ($p > 0.05$). However, on the fifth postoperative day, the scores for optimism, resilience and strength all increased, with the psychological support group showing higher scores than the conventional treatment group ($p < 0.05$) (Table 3).

Anxiety and Pain

There was no significant difference in anxiety scores between the two groups at baseline ($p > 0.05$). On postoperative day 5, the psychological support group had lower anxiety scores than the conventional treatment group ($p < 0.05$) (Table 4A). At 4 and 24 hours after surgery, the psychological support group had lower pain scores than the conventional treatment group ($p < 0.05$) (Table 4B).

Complications

The complication rate in the psychological support group was 6.67%, which was lower than that in the conventional treatment group ($p < 0.05$) (See Table 5).

Table 2. Comparison of self-efficacy between the two groups of patients.

Group	n	Positive attitude		Self-decision		Self-stress reduction	
		Baseline period	Fifth day after surgery	Baseline period	Fifth day after surgery	Baseline period	Fifth day after surgery
Psychological support group	60	33.63 ± 4.02	45.95 ± 5.08 ^a	6.19 ± 2.01	10.28 ± 1.42 ^a	24.98 ± 3.07	34.29 ± 4.82 ^a
Conventional treatment group	60	33.82 ± 3.49	40.51 ± 4.75 ^a	6.23 ± 1.89	8.54 ± 1.66 ^a	24.49 ± 2.85	30.13 ± 4.55 ^a
<i>t</i>		0.276	−6.059	0.112	−6.170	−0.906	−4.861
<i>p</i>		0.783	<0.001	0.911	<0.001	0.367	<0.001
Cohen's <i>d</i>			1.11		1.12		0.89
95% CI			(0.72, 1.49)		(0.73, 1.51)		(0.51, 1.26)

Note: ^a*p* < 0.05 for the within-group comparison. CI, confidence interval.

Table 3. Comparison of psychological resilience between the two groups of patients.

Group	n	Optimism		Resilience		Strength	
		Baseline period	Fifth day after surgery	Baseline period	Fifth day after surgery	Baseline period	Fifth day after surgery
Psychological support group	60	6.29 ± 1.77	11.50 ± 1.66 ^a	28.46 ± 3.92	35.37 ± 4.90 ^a	14.86 ± 4.13	21.05 ± 3.55 ^a
Conventional treatment group	60	6.38 ± 1.56	8.67 ± 1.59 ^a	27.98 ± 4.13	31.18 ± 3.85 ^a	15.02 ± 4.51	18.47 ± 2.94 ^a
<i>t</i>		0.295	−9.537	−0.653	−5.208	0.203	−4.336
<i>p</i>		0.768	<0.001	0.515	<0.001	0.840	<0.001
Cohen's <i>d</i>			1.74		0.95		0.79
95% CI			(1.33, 2.14)		(0.57, 1.33)		(0.42, 1.16)

Note: ^a*p* < 0.05 for the within-group comparison. CI, confidence interval.

Table 4A. Comparison of anxiety between the two groups of patients.

Group	n	Anxiety	
		Baseline period	Fifth day after surgery
Psychological support group	60	63.12 ± 7.21	46.91 ± 3.46 ^a
Conventional treatment group	60	63.63 ± 8.06	49.41 ± 5.08 ^a
<i>t</i>		0.365	3.151
<i>p</i>		0.716	0.002
Cohen's <i>d</i>			−0.57
95% CI			(−0.94, −0.20)

Note: ^a*p* < 0.05 for the within-group comparison. CI, confidence interval.

Table 4B. Comparison of pain between the two groups of patients.

Group	n	Pain	
		4 hours after surgery	24 hours after surgery
Psychological support group	60	4.12 ± 0.62	1.28 ± 0.33 ^a
Conventional treatment group	60	4.86 ± 0.59	1.92 ± 0.51 ^a
<i>t</i>		6.697	8.161
<i>p</i>		<0.001	<0.001
Cohen's <i>d</i>		−1.21	−1.49
95% CI		(−1.60, −0.82)	(−1.90, −1.08)

Note: ^a*p* < 0.05 for the within-group comparison. CI, confidence interval.

Table 5. Comparison of complications between the two groups of patients[n (%)].

Group	n	Nausea and vomiting	Dizziness and headache	Laryngeal oedema	Surgical site infection	Hoarse voice	Total
Psychological support group	60	1 (1.67)	1 (1.67)	0 (0.00)	1 (1.67)	1 (1.67)	4 (6.67)
Conventional treatment group	60	3 (5.00)	2 (3.33)	1 (1.67)	2 (3.33)	4 (6.67)	12 (20.00)
χ^2		-	-	-	-	-	4.615
<i>p</i>		-	-	-	-	-	0.032

*Since the expected frequencies of individual complications were all less than 5, the data are presented descriptively only. The risk of complications in the psychological support group was significantly lower than that in the conventional treatment group (OR = 0.286, 95% CI: 0.086–0.947).

Table 6. Comparison of AAHLS health literacy scores between the two groups of patients.

Group	n	Information capabilities		Communication skills		Application capabilities		Total	
		Baseline period	Fifth day after surgery	Baseline period	Fifth day after surgery	Baseline period	Fifth day after surgery	Baseline period	Fifth day after surgery
Psychological support group	60	6.53 ± 0.79	7.94 ± 0.69 ^a	5.53 ± 0.68	7.64 ± 0.52 ^a	7.44 ± 0.91	8.92 ± 1.03 ^a	19.50 ± 3.01	24.50 ± 2.97 ^a
Conventional treatment group	60	6.41 ± 0.61	7.01 ± 0.74 ^a	5.61 ± 0.72	6.52 ± 0.62 ^a	7.53 ± 0.75	8.07 ± 0.64 ^a	19.55 ± 2.76	21.60 ± 2.88 ^a
<i>t</i>		0.931	7.120	0.626	10.721	0.591	6.707	0.095	5.430
<i>p</i>		0.354	<0.001	0.533	<0.001	0.556	<0.001	0.925	<0.001
Cohen's d			1.29		1.96		0.99		0.99
95% CI			(0.90, 1.68)		(1.54, 2.38)		(0.61, 1.37)		(0.61, 1.37)

Note: ^a*p* < 0.05 for the within-group comparison. CI, confidence interval.

Health Literacy Score

At baseline, there were no significant differences in the health literacy dimensions or total scores between the two groups (*p* > 0.05). On the fifth postoperative day, health literacy scores increased, with the psychological support group scoring higher than the conventional treatment group (*p* < 0.05) (See Table 6).

Discussion

The thyroid gland is an important endocrine gland in the human body, surrounded by a rich network of blood vessels and nerves. Total thyroidectomy carries a high surgical risk and a high rate of postoperative complications. Furthermore, the complex structure of the neck and the limited surgical space make the procedure more difficult. Consequently, patients undergoing total thyroidectomy often experience significant negative emotions [16,17].

The main purpose of providing preoperative psychological support is to alleviate anxiety and depression, build confidence and promote patients' active cooperation in surgery, ensuring the procedure runs smoothly and reducing the stress experienced by patients during surgery [18]. This study found, through a review of medical records, that patients who received additional preoperative psychological

support showed better recovery trends in multiple outcome indicators. The core elements of psychological support practices reflected in the medical records were grading assessment, information support, emotional counselling and family guidance. Providing differentiated psychological attention based on the level of patient anxiety reflects the concept of individualised care and may help improve the patient experience [19,20].

The results of this study showed that on the fifth day after surgery, patients in the psychological support group had higher self-efficacy scores in all dimensions (positive attitude, self-decision-making and self-stress reduction) than those in the conventional treatment group (*p* < 0.05). This may be because patients who gain more disease-related knowledge and hear about successful cases before surgery may have a deeper understanding of the surgery and rehabilitation process. This may help to reduce their fear of the unknown and enhance their confidence in overcoming the disease [21,22]. In addition, encouraging family members to participate in the social support network established via WeChat groups may positively impact patients' psychological well-being [8]. These factors may explain why patients in the psychological support group exhibited higher self-efficacy.

Psychological resilience is a high-quality psychological coping mechanism that patients develop during surgery.

The higher the score, the better the patient's psychological state [23]. In this study, the scores for optimism, resilience and strength all increased for patients on the fifth day after surgery, with those in the psychological support group showing higher scores than those in the conventional treatment group ($p < 0.05$). This improvement in the psychological resilience score of this group of patients may be related to the individualised psychological support model received by this group of patients. By quantifying preoperative anxiety, medical staff could provide personalised psychological support based on each patient's anxiety level, thus improving the relevance of support [24]. One-to-one communication and preoperative knowledge dissemination may help patients to better understand their condition and reduce their fear of the unknown [25,26]. Additionally, multifaceted emotional guidance, such as relaxation training, meditation and environmental regulation, may enhance patients' ability to self-regulate and facilitate their transition from passive acceptance to active participation in their care [27]. The combined effect of these factors may explain the higher level of psychological resilience exhibited by patients in the psychological support group.

In addition, anxiety and pain levels in the psychological support group were lower than in the conventional treatment group on the fifth day after surgery ($p < 0.05$). Previous studies have suggested that preoperative psychological support can help patients to rebuild their understanding of surgery and alleviate their fear. The emotional support network formed by doctors and their families may help alleviate patients' feelings of loneliness and stress. Emotional relaxation therapy may alleviate anxiety by activating the parasympathetic nervous system, reducing heart rate and stress hormone levels [28,29]. In addition, anxiety and pain are bidirectionally regulated, so a decrease in anxiety levels could theoretically reduce pain perception. Muscle relaxation training and attention transfer skills, which patients can learn before surgery, may also play a role in affecting the transmission of pain signals and increasing pain thresholds [30,31]. However, these mechanisms were not directly measured in this study and the explanations are speculative.

This study found that the incidence of complications in the psychological support group was 6.67%, which was lower than that in the conventional treatment group ($p < 0.05$). The difference was statistically significant. However, this result should be interpreted with caution. Complications following total thyroidectomy, such as recurrent laryngeal nerve injury, hypoparathyroidism, incision infection, etc., depend primarily on the precision of the surgical procedure, the surgeon's ability to recognise and protect the recurrent laryngeal nerve and parathyroid gland, tracheal intubation injury and the patient's own basic anatomical

conditions, as well as other factors related to the surgery [32–34]. These factors were neither included in the analysis nor controlled for in this retrospective study. Due to its retrospective design, this study cannot exclude the influence of other unmeasured confounding factors, such as the technical ability of the surgical team, the quality of anaesthesia management and differences in perioperative medication, on the incidence of complications. Therefore, the difference in complication rates between the two groups should be considered as an exploratory observation rather than evidence that psychological support directly reduces the incidence of complications. This study speculates that if psychological support has any indirect impact on the risk of complications, this may be via overall relief of perioperative stress responses and better patient compliance with postoperative medical orders [35]. However, this hypothesis requires validation through prospective studies incorporating biomarkers (e.g., cortisol, inflammatory factors) and detailed surgical variables, and the complication data in this study should be regarded as preliminary exploratory evidence only.

Improving health literacy can help patients cope better with diseases and is also an indicator of an improvement in their quality of life. In this study, the health literacy scores improved on the fifth day after surgery, with the psychological support group showing a statistically significant improvement compared with the conventional treatment group ($p < 0.05$). The knowledge transmitted during preoperative psychological support may help patients to obtain more accurate information about their disease and the surgery. The self-regulation skills learnt under the guidance of medical staff, combined with the companionship and encouragement of family members, may help enhance patients' ability to cope with stress. Meanwhile, the strengthening of beliefs may increase patients' acceptance of surgery and help them to use health information more effectively to manage negative emotions and discomfort. In addition, continuous evaluation and dynamic adjustment during the psychological support process may ensure that the support content aligns with patients' changing needs [36]. The combined effect of these factors may explain why patients in the psychological support group exhibited higher levels of health literacy.

This study has the following limitations. Firstly, the grouping in this retrospective study relies on medical records that were not created for research purposes. Psychological support in clinical practice is individualised, with combinations of frequency, duration and content that vary from person to person. Detailed execution processes are not fully documented in medical records. This means that intergroup comparisons reflect the statistical associa-

tion of outcomes between two groups of patients with or without additional psychological support, rather than the difference in efficacy between two standardised intervention regimens. Secondly, this study has a retrospective design and grouping is based on the inclusion of psychological support content in medical records rather than randomised allocation. There is a risk of selection bias, whereby clinical nurses may be more inclined to provide additional psychological support to patients displaying obvious emotional reactions. This could lead to potential differences between the two groups in unobservable confounding factors, such as personality traits and coping styles. As the retrospective data in this study were complete, propensity score matching or multiple regression analysis was not implemented to control for the aforementioned confounding factors. Additionally, this study is a single-centre design and all patients come from the same hospital, the representativeness of the sample is limited. Thirdly, the evaluation of outcome measures in this study is limited. Blinding was not used to evaluate outcome measures, so evaluators were aware of patient grouping when reviewing medical records and recording data on complications, scale scores, etc. Additionally, patients themselves were aware of the psychological support they received, which may have introduced measurement bias. Furthermore, medical records mainly focus whether complications are present or absent, without systematically grading or quantitatively evaluating their severity, which may result in some clinically important information being lost. Fourthly, the content of the psychological support provided is not standardised, so the support offered by different medical staff may vary. Fifthly, the follow-up period is relatively short, which makes it impossible to evaluate the long-term effects of preoperative psychological support on factors such as long-term postoperative quality of life and compliance with thyroid replacement therapy. Finally, this study did not conduct a prospective sample size estimation during the design phase. Without a prior sample size calculation based on minimum clinically significant differences, it is impossible to confirm statistically that the current sample size is sufficient to detect clinically significant effect sizes. This affects the robustness of the study's conclusions to some extent. Therefore, the conclusions of this study should be regarded as correlational rather than causal. Future multicentre, prospective, randomised controlled, blinded, long-term follow-up studies should incorporate standardised psychological support protocols, clear inclusion criteria and rigorous sample size estimation in order to provide higher-level evidence and the potential to further introduce immunological indicators for exploring biological mechanisms [37].

Conclusions

In conclusion, this retrospective study found that patients who received additional psychological support recorded in preoperative medical records had higher levels of self-efficacy, psychological resilience and health literacy, as well as lower levels of anxiety and pain. The incidence of complications also showed intergroup differences. These findings suggest that the clinical significance of preoperative psychological support merits further investigation. However, due to the limitations of the retrospective design, these results should be considered exploratory finding rather than definitive.

Availability of Data and Materials

The datasets used and analysed during the current study were available from the corresponding author on reasonable request.

Author Contributions

YWu: Conceived and designed the research; supervised the study; drafted and revised the manuscript; obtained funding and ethical approval; responsible for correspondence and final approval. KA: Collected and sorted clinical data; completed partial experiments and statistics; participated in manuscript drafting and revision. AB: Assisted in research design; participated in subject follow-up and data sorting; provided technical support. SD: Responsible for core data statistical analysis; assisted in result interpretation and manuscript revision. SH: Collected literature; assisted in manuscript writing; checked references and format. CD: Assisted in clinical data collection and experiments; proofread the manuscript. YWa: Sorted research data; assisted in manuscript revision and final review. MA: Participated in case follow-up and data collection; assisted in manuscript revision. HW: Participated in clinical research and case screening; assisted in data entry and manuscript revision. All authors have read and agreed to the published version of the manuscript, and 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.

Ethics Approval and Consent to Participate

The study was approved by the Ethics Committee of the First Affiliated Hospital of Xinjiang Medical University (approval number: 251015-16). The study complies

with the requirements of the Helsinki Declaration, and all research subjects have given informed consent.

Acknowledgment

Not applicable.

Funding

None.

Conflict of Interest

The authors declare no conflict of interest.

References

- [1] Sitges-Serra A. Etiology and Diagnosis of Permanent Hypoparathyroidism after Total Thyroidectomy. *Journal of clinical medicine*. 2021; 10: 543. <https://doi.org/10.3390/jcm10030543>.
- [2] Cao B, Wu G. Risk factors for hypocalcemia after total thyroidectomy: a narrative review. *PeerJ*. 2025; 13: e19808. <https://doi.org/10.7717/peerj.19808>.
- [3] Liu L, Xiang Y, Xiong L, Li C, Dai W, Hu J, *et al.* Assessment of preoperative health-related quality of life in patients undergoing thyroidectomy based on patient-reported outcomes. *Frontiers in psychology*. 2024; 15: 1329175. <https://doi.org/10.3389/fpsyg.2024.1329175>.
- [4] Zeng Q, Fu Y, Yang J, Yang H, Ma T, Pan Z, *et al.* Knowledge, Attitudes, and Practices Regarding Voice Disorders After Thyroid Surgery: A Cross-Sectional Study Among Patients in Southwestern Mainland China. *Journal of voice: official journal of the Voice Foundation*. 2024. <https://doi.org/10.1016/j.jvoice.2024.10.026>.
- [5] Syed A, Menezes T, Bisenius A, Sic A, Knezevic NN. The Burden of Preoperative Stress: Biological Mechanisms and Postoperative Outcomes. *Brain sciences*. 2026; 16: 219. <https://doi.org/10.3390/brainsci16020219>.
- [6] Ruiz Hernández C, Gómez-Urquiza JL, Pradas-Hernández L, Vargas Roman K, Suleiman-Martos N, Albendín-García L, *et al.* Effectiveness of nursing interventions for preoperative anxiety in adults: A systematic review with meta-analysis. *Journal of advanced nursing*. 2021; 77: 3274–3285. <https://doi.org/10.1111/jan.14827>.
- [7] Altinbas BC, Gürsoy A. Nurse-led web-based patient education reduces anxiety in thyroidectomy patients: A randomized controlled study. *International journal of nursing practice*. 2023; 29: e13131. <https://doi.org/10.1111/ijn.13131>.
- [8] He J, Xia J. Effect of a WeChat-based perioperative nursing intervention on risk events and self-management efficacy in patients with thyroid cancer. *American journal of translational research*. 2021; 13: 8270–8277.
- [9] Zung WW. A rating instrument for anxiety disorders. *Psychosomatics*. 1971; 12: 371–379. [https://doi.org/10.1016/S0033-3182\(71\)71479-0](https://doi.org/10.1016/S0033-3182(71)71479-0).
- [10] Qian HJ, Yuan CR. Reliability and validity assessment of the Chinese version of the Cancer Self-Management Efficacy Scale. *Chinese Journal of Nursing*. 2011; 46: 87–89. (In Chinese)
- [11] Qian HJ. Cross-sectional study on the level of self-management efficacy in cancer patients and analysis of imaging factors. Shanghai: The Second Military Medical University. 2011. (In Chinese)
- [12] Zhan N, Xu Y, Pu J, Wang W, Xie Z, Huang H. The interaction between mental resilience and insomnia disorder on negative emotions in nurses in Guangdong Province, China. *Frontiers in psychiatry*. 2024; 15: 1396417. <https://doi.org/10.3389/fpsyg.2024.1396417>.
- [13] Yan GB. NRS Pain Numerical Rating Scale. *Chinese Journal of Arthroscopy (Electronic Edition)*. 2014; 8: 410. (In Chinese)
- [14] Jin S, Sugitani I. Narrative review of management of thyroid surgery complications. *Gland surgery*. 2021; 10: 1135–1146. <https://doi.org/10.21037/gs-20-859>.
- [15] Wu Q, Ye XC, Wu YP, Zhao L, Wu J. Chinese version and reliability and validity analysis of the comprehensive health literacy measurement scale. *China General Practice*. 2017; 20: 1229–1233. (In Chinese)
- [16] Fackelmayer OJ, Wu JX, Yeh MW. Endocrine Surgery: Management of Postoperative Complications Following Endocrine Surgery of the Neck. *The Surgical clinics of North America*. 2021; 101: 767–784. <https://doi.org/10.1016/j.suc.2021.05.019>.
- [17] Pitt SC, Saucke MC, Roman BR, Alexander SC, Voils CI. The Influence of Emotions on Treatment Decisions About Low-Risk Thyroid Cancer: A Qualitative Study. *Thyroid: official journal of the American Thyroid Association*. 2021; 31: 1800–1807. <https://doi.org/10.1089/thy.2021.0323>.
- [18] Javaloyes N, Crespo A, Redal MC, Brugarolas A, Botella L, Escudero-Ortiz V, *et al.* Psycho-Oncological Intervention Through Counseling in Patients With Differentiated Thyroid Cancer in Treatment With Radioiodine (COUNTHY, NCT05054634): A Non-randomized Controlled Study. *Frontiers in psychology*. 2022; 13: 767093. <https://doi.org/10.3389/fpsyg.2022.767093>.
- [19] Perkins JM, Papaleontiou M. Towards De-Implementation of low-value thyroid care in older adults. *Current opinion in endocrinology, diabetes, and obesity*. 2022; 29: 483–491. <https://doi.org/10.1097/MED.0000000000000758>.
- [20] Patel Chavez CP, Godínez Leiva E, Bagautdinova D, Hidalgo J, Hartasánchez S, Barb D, *et al.* Patient feedback receiving care using a shared decision making tool for thyroid nodule evaluation—an observational study. *Endocrine*. 2023; 80: 124–133. <https://doi.org/10.1007/s12020-022-03277-4>.
- [21] Gonella S, Delfino C, Rolfó M, Rizzo A, Esposito V, Berchialla P, *et al.* Effects of a Video-Based Preoperative Educational Intervention Plus Nurse-Led Reinforcement Discussion on Knowledge, Self-Efficacy, and Resilience in Patients Undergoing Major Surgery. *Clinical nursing research*. 2021; 30: 753–761. <https://doi.org/10.1177/1054773820986916>.
- [22] Steves SL, Scafide KN. Multimedia in preoperative patient education for adults undergoing cancer surgery: A systematic review. *European journal of oncology nursing: the official journal of European Oncology Nursing Society*. 2021; 52: 101981. <https://doi.org/10.1016/j.ejon.2021.101981>.
- [23] Nwankwo VC, Jiranek WA, Green CL, Allen KD, George SZ,

- Bettger JP. Resilience and pain catastrophizing among patients with total knee arthroplasty: a cohort study to examine psychological constructs as predictors of post-operative outcomes. *Health and quality of life outcomes*. 2021; 19: 136. <https://doi.org/10.1186/s12955-021-01772-2>.
- [24] Gillis C, Gill M, Gramlich L, Culos-Reed SN, Nelson G, Ljungqvist O, *et al.* Patients' perspectives of prehabilitation as an extension of Enhanced Recovery After Surgery protocols. *Canadian journal of surgery. Journal canadien de chirurgie*. 2021; 64: E578–E587. <https://doi.org/10.1503/cjs.014420>.
- [25] Stewart JA, Wood L, Wiener J, Kennedy GD, Chu DI, Lancaster JR, *et al.* Visual teaching aids improve patient understanding and reduce anxiety prior to a colectomy. *American journal of surgery*. 2021; 222: 780–785. <https://doi.org/10.1016/j.amjsurg.2021.01.029>.
- [26] Ozbek MN, Seyhan Ak E. The Effect of Preoperative Tele-nursing Counseling on Anxiety and Patient Satisfaction in Day Surgery: A Randomized Controlled Trial. *Journal of perianesthesia nursing: official journal of the American Society of PeriAnesthesia Nurses*. 2025; 40: 852–860. <https://doi.org/10.1016/j.jopan.2024.09.006>.
- [27] Ge H, Wang H, Ma X, Sun D, Zhang Z, Li S. A randomised controlled trial to improve the resilience of oesophageal cancer survivors in rural China: A study protocol. *Journal of clinical nursing*. 2023; 32: 4116–4127. <https://doi.org/10.1111/jocn.16638>.
- [28] Ozhanli Y, Akyuz N. The Effect of Progressive Relaxation Exercise on Physiological Parameters, Pain and Anxiety Levels of Patients Undergoing Colorectal Cancer Surgery: A Randomized Controlled Study. *Journal of perianesthesia nursing: official journal of the American Society of PeriAnesthesia Nurses*. 2022; 37: 238–246. <https://doi.org/10.1016/j.jopan.2021.08.008>.
- [29] Chen HY, Yang H, Men CE, Shen CH, Chen HM. Effect of deep pressure input on autonomic regulation during wisdom tooth extraction: From waiting room to surgery. *Journal of dental sciences*. 2025; 20: 1204–1212. <https://doi.org/10.1016/j.jds.2025.02.003>.
- [30] Kulakaç N, Sayılan AA. Impact of Preoperative Progressive Relaxation Exercises on Postoperative Pain, Comfort, and Recovery: A Randomized Controlled Trial. *Holistic nursing practice*. 2025; 39: 356–363. <https://doi.org/10.1097/HNP.0000000000000702>.
- [31] Abbasnia F, Aghebati N, Miri HH, Etezdapour M. Effects of Patient Education and Distraction Approaches Using Virtual Reality on Pre-operative Anxiety and Post-operative Pain in Patients Undergoing Laparoscopic Cholecystectomy. *Pain management nursing: official journal of the American Society of Pain Management Nurses*. 2023; 24: 280–288. <https://doi.org/10.1016/j.pmn.2022.12.006>.
- [32] Kano Y, Yamada K, Muto M, Oomura M, Matsukawa N. Reproducible Presyncope Due to Osteophyte Compression Into Transverse Foramen of the C5 Vertebra. *Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association*. 2021; 30: 105562. <https://doi.org/10.1016/j.jstrokecerebrovasdis.2020.105562>.
- [33] Mavrovounis G, Drivas K, Syrakouli A, Syrakouli E, Mermiri M, Papanagiotou P, *et al.* Stroke at the Hairdresser's chair: A scoping review of the beauty parlor stroke syndrome. *The American journal of emergency medicine*. 2025; 91: 29–36. <https://doi.org/10.1016/j.ajem.2025.02.016>.
- [34] Bach K, Ansari P, Ansari H, Mott NM, Elfenbein DM, Underwood H, *et al.* Health-Related Quality of Life in Patients with Low-Risk Differentiated Thyroid Cancer: A Systematic Review Examining the Extent of Thyroidectomy. *Thyroid: official journal of the American Thyroid Association*. 2024; 34: 14–25. <https://doi.org/10.1089/thy.2023.0328>.
- [35] Nadinda PG, van Ryckeghem DML, Peters ML. Can perioperative psychological interventions decrease the risk of postsurgical pain and disability? A systematic review and meta-analysis of randomized controlled trials. *Pain*. 2022; 163: 1254–1273. <https://doi.org/10.1097/j.pain.0000000000002521>.
- [36] Nutbeam D, Lloyd JE. Understanding and Responding to Health Literacy as a Social Determinant of Health. *Annual review of public health*. 2021; 42: 159–173. <https://doi.org/10.1146/annurev-publhealth-090419-102529>.
- [37] Narote S, Desai SA, Patel VP, Deshmukh R, Raut N, Dapse S. Identification of new immune target and signaling for cancer immunotherapy. *Cancer genetics*. 2025; 294–295: 57–75. <https://doi.org/10.1016/j.cancergen.2025.03.004>.