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A Comparative Study of Complication Rates and Quality of Life Following Total versus Partial Thyroidectomy in Sulaymaniyah City

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Abstract

Background: A variety of thyroid disorders including benign and malignant that are indicated for either total or partial thyroidectomy. Although both surgeries aimed to eliminate the symptoms and prevent the progression of the disease, their impact on quality of life and complication rate may vary. The current study aimed to compare complication rate and quality of life outcomes (QoL) between total and partial thyroidectomy patients. Methods: A cross-sectional study was conducted between November 2024 and April 2025 involving 160 patients (80 total thyroidectomies, 80 partial thyroidectomy) who had undergone thyroid surgery at Shar Hospital and Smart Health Tower. Data were collected through a semi-structured questionnaire that covered physical, emotional, and social QoL domains. Statistical analysis was performed by using SPSS through chi-square, Mann-Whitney, and Kruskal-Wallis tests. Results: The majority of participants were female (76.9%) and aged between 36–55 years. The total thyroidectomy group showed a significantly higher rate of postoperative complications ($p = 0.013$), with seroma and hypocalcemia being the most frequent. Total thyroidectomy was also associated with significantly higher impairment in physical ($p < 0.001$), emotional ($p = 0.003$), and social ($p = 0.007$) quality of life domains. Conclusion: Patients having a total thyroidectomy reported decreased quality of life and more postoperative complications than those having a partial thyroidectomy. These results emphasize the importance of surgical decision-making and the need for accurate preoperative counseling, especially with relation to expected outcomes and QoL effects.

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Introduction

The thyroid gland is a butterfly-shaped endocrine organ situated in the anterior neck, it is essential for regulating physiological functions critical to maintaining health and well-being (1). Thyroid disorders constitute a major global health issue, impacting millions of people worldwide, and can be classified into thyroid dysfunctions (hypothyroidism, hyperthyroidism) and structural diseases, including goiter, nodules, and thyroid cancer (1). Approximately 1 in 20 Americans may encounter thyroid disease at some point in their lives, with women being approximately seven times more susceptible than males; hence, 1 in 8 American women will suffer a thyroid issue over their lifetime (2).

Surgical intervention, in the form of either total or partial thyroidectomy is frequently recommended treatment for various thyroid conditions, such as thyroid cancer, large goiters causing compressive symptoms, hyperthyroidism unresponsive to medical management, benign thyroid nodules, and others (3). Thyroid surgery has increased during the previous three decades, according to

various studies, and it is more common in women than in males. Between 118,000 and 166,000 patients in the US receive thyroidectomies every year for both benign and malignant illnesses (4).

Researchers and physicians are increasingly acknowledging the need of assessing postoperative patients' health-related quality of life (HRQOL) and quality of life (5). Quality of life (QoL) is a multidimensional concept that includes areas related to mental, emotional, social, and physical functional well-being (6), The majority of health-related quality of life (HRQOL) domains are known to be impaired in patients with thyroid disease or thyroid surgery, including hypothyroidism and hyperthyroidism or total and partial thyroidectomy, and HRQOL studies deal with patients' perceptions of the impact of disease and its treatment on all aspects of life, including physical, mental, social, and functional (7).

Thyroidectomy may result in consequences, the most common of which are hypocalcemia, seroma, recurrent laryngeal damage, hematoma, wound infection, and hoarse voice. Hypocalcemia and seroma are two common postoperative consequences of thyroid surgery, generating potentially severe symptoms, increasing inpatient duration, and lowering HRQOL (8). The complications, particularly recurrent laryngeal nerve injury, which can lead to voice alteration, stridor, and life-threatening conditions, present a higher risk in patients who have undergone total thyroidectomy compared to those who have had partial thyroidectomy or thyroid lobectomy, potentially severely affecting quality of life outcomes (9).

Since it would greatly affect their general well-being and recovery, the complication rate and quality of life of the patients after thyroid surgery should be given considerable attention. The aim of this study is to evaluate the quality of life and complication rate in patients having either partial or complete thyroidectomy.

Methodology

Study design and setting

A cross-sectional, questionnaire-based study was conducted on the population of Sulaymaniyah City attending Shar Hospital (public sector) and Smart Health Tower (private sector) from 25th November 2024 to 25th February 2025 to compare complication rates and quality of life in patients who underwent total thyroidectomy versus partial thyroidectomy. Through convenient sampling, 160 patients who underwent total thyroidectomy and partial thyroidectomy were collected.

Inclusion and Exclusion Criteria

The inclusion criteria include patients over the age of eighteen and those who have undergone both complete or partial thyroidectomy, and the procedure must have been carried out at least three months before the interview to guarantee accurate findings and reduce bias or confusing elements.

The exclusion criteria include patients who underwent surgery less than three months prior to the interview, as side effects such as anesthesia, wound pain, and other immediate postoperative factors could impact QoL, patients aged less than 18 years and patients with thyroid cancer, since the cancer or its treatments, such as chemotherapy or radiotherapy may affect QoL beyond the surgical procedure.

The Study Instrument

A semi-constructed questionnaire was used for the data collection, which was composed of three domains of quality of life, including physical and psychosocial scales.

Pilot Study

A pilot study was conducted on a sample of 10 post-thyroidectomy patients (5 total thyroidectomy and 5 partial thyroidectomy). It was carried out from 5th November 2024 to 20th November 2024 to determine the reliability of the questionnaire.

Statistical Analysis

We conducted the statistical analysis using Chicago, USA's version 28 of the statistical package for social science (SPSS) for Windows. Descriptive statistics, Chi square test utilized for qualitative variables, Mann Whitney test and the Kruskal-Wallis test were used for quantitative variables, The Kolmogorov-Smirnov test was used to ascertain the normal distribution status of the data, which revealed non-normally distributed data.

Ethical Approval and Ethical Considerations

The ethical committee of the College of Nursing/University of Sulaimany approved the study idea. Participants gave agreed-upon consent after being advised of the study's aim. Patient data was kept confidential during the course of the study.

Result

According to the findings, only 23.1% of the total participants were male, most of the participants (76.9%) were female. Married people made up the majority (87.5%), with single people making up a smaller minority (8.8%). Most participants fell between 36–55 years (49.4%). A significant portion of the participants were illiterate (38.8%) in the other hand, most of the patients were housewives (64.4%). In terms of economic position, most of the participants (70.0%) said that their income was barely sufficient to satisfy their basic necessities, as indicated in Table 1.

Table 2 shows individuals divided equally between total and partial thyroidectomy. While 28.1% of the patients had surgery within 3–6 months before the interview, most of them (65.6%) had surgery six months to one year before the interview. 43.1% of the patients reported a positive family history of thyroid disease, while more than half reported a negative family history of the thyroid disorder. 35% of the participants have chronic illnesses, the most frequently occurring ones were hypertension (19.4%), followed by diabetes (6.3%), both conditions (4.4%), heart disease (1.3%), and other diseases

Table 3 indicates that 42.5% of patients who had a partial thyroidectomy and 36.3% of patients who had a total thyroidectomy reported no postoperative complications. Seroma (8.1% vs. 2.5%) was the most common complication, followed by hypocalcemia (3.1% vs. 2.5%). Only the group with total thyroidectomy experienced hoarseness of voice (1.3%). The group that underwent a total thyroidectomy experienced a significantly higher rate of complications ($p = 0.013$, Chi-Square test).

Table 4 shows that physical symptom scores were significantly higher in total thyroidectomy patients compared to partial thyroidectomy patients. The Mann-Whitney test used for statistical analysis showed mean rank scores were consistently higher in the total thyroidectomy group for several symptoms, which means total thyroidectomy has a greater negative impact on physical quality of life. Fatigue and tiredness had a mean rank of 89.33 in the total thyroidectomy group versus 71.68 in the partial thyroidectomy group ($p = 0.006$). Neck pain or discomfort was also more common (90.46 vs. 69.67, $p = 0.002$), as were voice changes and difficulty swallowing, both with mean ranks of 90.26 compared to 70.74 in the partial group ($p = 0.003$ each). Although numbness or tingling was slightly higher in the total group (84.01 vs. 76.99), this difference was not statistically significant ($p = 0.293$). According to these findings, compared to partial thyroidectomy, total thyroidectomy is associated with a higher burden of physical symptoms following surgery.

According to the results of the Mann-Whitney test, patients who had a total thyroidectomy expressed noticeably more emotional distress in particular areas than those who had a partial thyroidectomy. They had greater mean rankings for having difficulty in concentration (89.91 vs. 71.09, $p = 0.004$) and worrying about their health (90.12 vs. 69.75, $p = 0.001$). We found no significant differences in levels of anxiety ($p = 0.134$) or depression ($p = 0.340$), indicating similar experiences of these symptoms across both groups. In general, total thyroidectomy was associated with increased emotional burden, especially in terms of difficulty concentrating and health-related concerns, as shown in Table 5.

Total thyroidectomy has been associated with a higher negative impact on certain social aspects, as Table 6 demonstrates. Compared to patients who had partial thyroidectomy, patients with total thyroidectomy reported significantly more difficulties at work or school (mean rank = 89.03 vs. 71.97, $p = 0.011$) and higher levels of loneliness or isolation (87.44 vs. 73.56, $p = 0.038$). The difficulties with family life and social activities also had higher mean rankings, but these differences were not statistically significant ($p = 0.340$ and $p = 0.057$, respectively). These results imply that compared to partial thyroidectomy, total thyroidectomy may have a greater negative impact on specific social functioning domains.

Table 7 presents a comparison of the overall quality of life, which covers physical, emotional, and social domains, based on the type of thyroid surgery. The findings indicate that patients who underwent total thyroidectomy experienced significantly higher impairments across all three domains compared to those who had partial thyroidectomy. Specifically, the mean rank in the physical domain was 93.49 for total thyroidectomy versus 67.51 for partial thyroidectomy ($p < 0.001$), indicating greater physical challenges among the total thyroidectomy group. Similarly, emotional well-being was more negatively affected in the total thyroidectomy group, with a mean rank of 90.61 compared to 70.39 ($p = 0.003$). In the social domain, patients who had total thyroidectomy again showed higher levels of impairment, with a mean rank of 89.91 versus 71.09 ($p = 0.007$). These statistically significant differences suggest that total thyroidectomy is associated with a greater negative impact on patients' overall quality of life across physical, emotional, and social aspects.

Table 1. Sociodemographic Characteristics of Study Population

Variables	Categories	Frequency (N)	Percentage (%)
Age	15-35 years	26	16.3%
	36-55 years	79	49.4%
	56-75 years	53	33.1%
	76-95 years	2	1.3%
Gender	Male	37	23.1%
	Female	123	76.9%
Marital Status	Single	14	8.8%
	Married	140	87.5%
	Divorced	2	1.3%
	Widowed	4	2.5%
Education Level	Illiterate	62	38.8%
	Primary Education	47	29.4%
	Secondary Education	16	10.0%
	College	26	16.3%
	Postgraduate	9	5.6%
Occupation Status	Employed	39	24.4%
	Unemployed	17	10.6%
	Housewife	103	64.4%
	Retired	1	0.6%
Income Level	Sufficient	44	27.5%
	Barely Sufficient	112	70.0%
	Insufficient	4	2.5%

Table 2. Clinical Characteristic of the Study Participants

Variables	Categories	Frequency (N)	Percentage (%)
Types of Surgery	Total Thyroidectomy	80	50%
	Partial Thyroidectomy	80	50%
Time Since Operation	3-6 Months	45	28.1%
	6 Months - 1 Year	105	65.6%
	More than 1 Year	10	6.3%
Family History of Thyroid Disease	No	82	51.2%
	Yes	69	43.1%
Chronic Disease	No	104	65%
	Yes	56	35%
Type of Chronic Disease	Hypertension	31	19.4%
	Diabetes Mellitus	10	6.3%
	Heart Disease	2	1.3%
	Hypertension & Diabetes Mellitus	7	4.4%
	Others*	5	3.1%

*: Hashimotos disease (3 patients), Rheumatoid arthritis (2 patients)

Table 3. Association of Post-Operative Complications and Types of Surgery

Post-Operative Complications	Total Thyroidectomy N (%)	Partial Thyroidectomy N (%)	Both Groups N (%)
Hypocalcemia	5 (3.1%)	4 (2.5%)	9 (5.6%)
Hematoma	2 (1.3%)	1 (0.6%)	3 (1.9%)
Seroma	13 (8.1%)	4 (2.5)	17 (10.6%)
Hoarseness voice	2 (1.3%)	0 (0%)	2 (1.3%)
None	58 (36.3%)	68 (42.5%)	126 (78.8%)
*Others	2 (1.3%)	1 (0.6%)	3 (1.9%)

*Others: Wound infection in 2 patients, Keloid scar in a patient.

P value by Chi square test: 0.013

Table 4 Distribution of Physical Scores According to Types of the Surgery

Questions	Total Thyroidectomy (Mean rank)	Partial Thyroidectomy (Mean rank)	P value
Do you have fatigue or tiredness?	**89.33**	**71.68**	**0.006***
Do you have neck pain or discomfort?	**90.46**	**69.67**	**0.002***
Do you have voice change?	**90.26**	**70.74**	**0.003***
Do you have difficulty swallowing?	**90.26**	**70.74**	**0.003***
Do you have numbness or tingling in your feet or hands, face?	**84.01**	**76.99**	**0.293***

*: Mann-Whitney test

Table 5. Distribution of Emotional Scores According to Types of the Surgery

Questions	Total Thyroidectomy (Mean rank)	Partial Thyroidectomy (Mean rank)	P value
Worried about your health?	90.12	69.75	0.001*
Are you anxious or nervous?	85.43	75.58	0.134*
Are you depressed or sad?	83.58	77.42	0.340*

Difficulty in concentration?	89.91	71.09	0.004*

*: Mann-Whitney test

Table 6. Distribution of Social Scores According to Types of the Surgery

Questions	Total Thyroidectomy (Mean rank)	Partial Thyroidectomy (Mean rank)	P value
Difficulty with social activity?	86.85	74.15	0.057*
Problem with family life due to your condition?	83.63	77.37	0.340*
Problems at work or school due to your condition?	89.03	71.97	0.011*
Felt isolated or lonely because of your condition?	87.44	73.56	0.038*

*: Mann-Whitney test

Discussion

The sociodemographic and clinical characteristics

The current study included 160 patients who underwent total thyroidectomy (80 total thyroidectomy, 80 partial thyroidectomy). The sociodemographic analysis indicated that most participants were middle-aged (36–55), female (76.9%), married (87.5%), and housewives. A study by Chen et al. (2022) reported mostly female participants with a median age of 38 and most being married, supporting the current study's findings (10). Similarly, Yaniv et al. (2022) found that 83.1% of patients were female with a mean age of 54.5, aligning with our results, but marital status was not reported (11).

The differences in clinical characteristics among the patients may lead to various quality of life outcomes (12). The timing after thyroidectomy is important, as early postoperative factors may affect quality of life. To avoid this, we excluded patients operated on less than 3 months before the interview. Therefore, we categorized them to three groups 3-6 months, 6-1 year, and more than one year. Most of the patients underwent thyroidectomy between 6 months and 1 year ago (65.6 % of the patients). A family history of thyroid diseases exists in more than half of the current population (52.2%), therefore a patient with a family history of thyroid disease may have more risk of getting thyroid disease. An original article in Iraq showed that a patient with a family history of thyroid disease has higher risk of getting thyroid problems, especially in the male sex (13).

Asking about the existence of chronic disease is crucial because it may interfere with the quality of life outcomes. The current study revealed that 65% of the participants do not suffer from chronic diseases. The most common chronic disease in the current study is hypertension (19%). Followed by diabetes mellitus is the second most common one. Wanna Chen and colleagues have the same result with the current study, as most of the patients with chronic diseases have hypertension, followed by diabetes mellitus and heart diseases then other comorbidities (10).

Post-operative complication in total thyroidectomy versus partial thyroidectomy

Based on the analysis of the data, most of the patient either total or partial thyroidectomies did not have any complications after their surgery (78.8%). Whenever total thyroidectomy without any complications, about 36.3% of while partial complications, while 42.5% of the patients who had partial thyroidectomies had no complications, which means that, in general, total thyroidectomy has more complications than partial thyroidectomy. Mulita et al. demonstrated that although total thyroidectomy is a safe procedure in experienced hands, total thyroidectomy has a higher complication rate (14). A cohort study also demonstrated that total thyroidectomy has higher complication rate (15). There are some other studies as they demonstrated that there is no difference or too small differences regarding the complication rate in both group such as Al Sadder et al(16).

Based on the analysis, seroma is the most common complication and occurs more frequently in total thyroidectomy than in other procedures. A randomized control trial reported the same finding, which showed that seroma formation can occur in about 14% of the patients (17). However, Abothenain et al reported a different opinion as they showed seroma is unusual complication following thyroidectomy (18).

Hypocalcemia is the second most common complication in the current study (5.6%), while it is more frequent in the total thyroidectomy (3.1%) compared to partial thyroidectomy (2.5%). There are too many studies that revealed that hypocalcemia is more frequent in total thyroidectomy patients. Azadbakht et al. showed that age and duration of the surgery are not significantly associated with hypocalcemia, but total thyroidectomy and female patients have a higher risk of hypocalcemia (19). In contrast to this opinion, Mirghani et al showed that there is no significance difference between total thyroidectomy and thyroid lobectomy in term of hypocalcemia and recurrent laryngeal injury (20).

Regarding hematoma is not a common complication but is more frequent in total thyroidectomy. Fan et al. reported that total thyroidectomy is one of the common risk factors for hematoma formation compared to other techniques (21) Based on the current data, hoarseness of voice is not a common complication. There are few studies that examine the existence of voice change or hoarseness of voice between total and partial thyroidectomy, and mostly they reported that it is more common in total thyroidectomy than partial thyroidectomy, such as (Lang et al., 2016; Vicente et al., 2014). The other uncommon complications are keloid scar and wound infection, which were both seen in the total thyroidectomy group. Ciftci et al. demonstrated that total thyroidectomy typically results in the presence of keloid scars (24).

Distribution of Physical Scores According to Types of the Surgery

The analysis indicated that the score of fatigue and tiredness is higher in total thyroidectomy, as shown by the mean rank (89.33) versus partial thyroidectomy (71.68). A prospective cohort study allocated 2584 patients with thyroidectomy in different approaches, about 988 patients developed low energy or fatigue, and most of them underwent total thyroidectomy rather than partial thyroidectomy, but they also demonstrated that no significant difference can be seen in terms of neck pain and discomfort, while the present study reported that it is more common in total thyroidectomy than in partial thyroidectomy (25). A cross sectional study by Maki et al reported the same findings with the present study (26).

Voice change and difficulty swallowing significantly affect quality of life due to their roles in communication and nutrition. This study found that these issues are more common in total thyroidectomy (mean rank 90.2%) than in partial thyroidectomy (mean rank 70.7%), which is statistically significant. A prospective study showed that the incidence of voice change and difficulty swallowing is significantly high in the one month postoperative, while 12 months after the surgery, the incidence steadily decreased to few numbers and was more common in total thyroidectomy than hemithyroidectomy (27).

Tingling and numbness in the hands, face, and feet were more common in total thyroidectomy (mean rank 84) than partial thyroidectomy (76.9), even though the difference was small and not statistically significant. There are too many studies in the literature that show numbness or tingling is significantly higher in total thyroidectomy than partial thyroidectomy, such as (Azadbakht et al., Maraş et al.), while Bongers et al. showed that no significant difference can be seen between them.

Distribution of Emotional Scores According to Types of the Surgery

The analysis showed that total thyroidectomy patients reported significantly greater health-related worries than those with partial thyroidectomy (mean rank 90.1 vs. 69.7, $p = 0.001$, Mann-Whitney test). Although they were also more anxious or nervous (mean rank 85.4 vs. 75.5), this difference was not statistically significant. Although Bonger et al showed non-significant difference between total and partial thyroidectomy regarding the physical domain but they reported that a significant difference can be seen between both groups in the emotional wellbeing or psychological wellbeing domain (29). Nakamura et al has a different finding from Bonger et al, they suggested that there are no significant differences in worries of health, anxiousness and depression between total and partial thyroidectomy (30). While a systematic review by Landry et al showed that total thyroidectomy patients more tended in emotional distress and increased anxiousness and depression compared to hemi thyroidectomy or partial thyroidectomy (7).

Regarding anxiety and depression, the current study revealed that there is no significant differences between total and partial thyroidectomy in term of depressed and sadness as shown by the mean rank (83.5: 77.4) with P value (0.340) but regarding the difficulty in concentration, total thyroidectomy patients have more issues in concentration compared to partial thyroidectomy patients (mean rank 89.9: 71.09) and statistically significant (P value 0.004). As same as the previous two questions, Landry et al suggested that total thyroidectomy patients have more compliant in difficulty of concentration and depression (7). Król et al showed that difficult concentrating after thyroidectomy is not uncommon with mean of 32.15 while in late of postoperative period can be decreased significantly and more common in total thyroidectomy (31).

Distribution of Social Scores According to Types of the Surgery

Based on the analysis, total thyroidectomy patients have more problem with social activity than partial thyroidectomy based on their mean rank (86.8: 74.1) while statistically is not significant (P value 0.057). regarding issues within the family which is same as the social activity but their differences is not too much and it is not significant.

Bongers et al reported the same opinion regarding the social activity problems and issues within the family, as they showed that those symptoms are more common in total versus hemi thyroidectomy patients whenever like the present study, the P value showed insignificant in both variables which is 0.076 (29). Lan et al collected 69 cases who underwent thyroidectomy showed the same finding regarding the problems in the social activity and families and in contrast to the current study and other previous mentioned studies, their findings are significant statistically (32). Gerwan et al reported a different opinion as they showed that there is no difference between total and partial thyroidectomy regarding issues in the social activities and other variables which related to social domain of QoL (33).

The present study reported that there is a strong difference between total and partial thyroidectomy patients regarding problems in the work or school and feeling of isolation which both variables is more frequent in the total versus partial thyroidectomy with significant P value. Like above two variables, Landry et al reported the same finding (7). Bongers et al and Król et al reported the same result in the social domain of their questionnaire (29,31). Although Yaniv et al reported that daily life and social life more impaired in total thyroidectomy as same as the current study but they are no statistically significant (11). a population based cross sectional study reported that there is a significant difference between total and partial thyroidectomy regarding social problems and feeling of loneliness or isolation especially in young female and total thyroidectomy patients (34).

Conclusion

The complication rates and quality of life were evaluated among the patients who underwent total thyroidectomy and partial thyroidectomy in the current study. Based on the analysis, patients who underwent total thyroidectomy had more considerable postoperative complication rates, such as seroma, hypocalcemia, and hoarseness of voice in comparison to partial thyroidectomy. Furthermore, total thyroidectomy has been associated with more problems in three domains of quality of life, including physical and psychosocial, whereas partial thyroidectomy demonstrated fewer problems and better outcomes in most quality of life measures. This result suggests that partial thyroidectomy can help patients' overall health and recovery, particularly if total removal of the thyroid gland is not mandatory.

Limitation

There are certain limits in the present study. Due to the restricted time of the study, it was done in one city, and a convenience sample technique was used, which can influence the generalizability of the results. Self-reported quality of life could be affected by personal interpretation or recollection bias.

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