The long-term impact of neck scar satisfaction among thyroid surgery patients

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Abstract. This study evaluated scar satisfaction in Arabic patients who underwent thyroidectomy surgery using validated assessment tools. We aimed to assess the relationship between scar length and scar satisfaction, and validate Arabic versions of the universally used scar satisfaction questionnaires. In this retrospective cohort study, 60 patients who underwent thyroidectomy at King Abdulaziz University Hospital were enrolled. Scars were evaluated in two stages: firstly, by a clinician, and secondly, by a naïve observer. Ratings of disfigurement were measured using the validated Patient and Observer Scar Assessment Scale (POSAS) that was translated into Arabic. Results: The Arabic version of the POSAS showed good or excellent reliability. Average POSAS scores were 12.88, 18.02, and 7.53, respectively, indicating that most patients were satisfied. Incision size and POSAS scores (but not Patient and Naïve Observer scores) were positively correlated, and larger incisions resulted in greater dissatisfaction. Fitzpatrick Skin Type score and Observer scores were positively correlated, but there were no significant correlations between Patient and Naïve Observer scores with skin type. In conclusion, this study validated the Arabic version of universally used questionnaires for scar satisfaction. Most patients were satisfied with their neck scars regardless of scar length. Our findings pave the way for further research into patient postoperative scar satisfaction in Arabic-speaking populations.

Key words: Patient satisfaction, Thyroidectomy, Arabs, Scar, Quality of life

THYROID SURGERY is a common procedure, with 80,000 procedures performed per year in the USA [1]. The most common reason for thyroid surgery is suspected malignancy [2], and thyroid cancer accounts for 7.6% of all cancers in the Saudi population [3]. There are several approaches to thyroidectomy, including conventional thyroidectomy, where an incision is made at the center of the neck. This is the most common approach. The transoral thyroidectomy approach avoids a neck incision with an incision inside the mouth. The endoscopic anterior/breast approach involves an incision at the parasternal border of the breast [4]. In the endoscopic axillary approach, an incision is placed in the axilla so that the natural resting position of the arm conceals the scar. Finally, the robotic retroauricular ‘facelift’ approach involves an incision placed 1 cm posterior to the hairline [5].

Thyroid surgery has few serious complications; however, the prominence of postoperative scars remains a concern for patients [6]. As most post-thyroidectomy scars are visible and exposed because of its location, it is thought that this can produce cosmetic dissatisfaction and affect the quality of life postoperatively. A study conducted in 2016 in Indiana, USA found that most patients were satisfied with their neck scar appearance, while few felt the desire to hide the scar. In fact, the length of the scar played a major role in patient satisfaction rather than the appearance of the scar itself [7]. Another study, conducted in the UK, showed that scar length appears to have no relationship with patient satisfaction or improved esthetics [6]. The results from this study showed that patients were satisfied with their scars on the neck. This was evident from low scores in both appearance and consciousness subscale, that is, 13.3 (range, 9–31) and 8.5 (range, 6–24), respectively. Moreover, patient satisfaction improved with increased time since surgery ($p < 0.001$). A third study in Athens,
Greece supported this conclusion by concluding that different incision sizes do not affect patient satisfaction [8].

Our review of the current literature revealed there were variations in results between studies, and no studies had been conducted in the Arab world. It is well known that the nature of the Arab skin is different from that of the skin of other ethnicities, and this warrants more investigation into postoperative satisfaction with neck scars in Arabic-speaking populations.

Head and neck cancer care systems aim to improve the quality of care by measuring patient satisfaction, and therefore, special consideration of patient satisfaction after thyroidectomy is required [9]. Therefore, the primary aim of this study was to assess the long-term impact of scar satisfaction and the relationship between scar length and scar satisfaction among patients who underwent thyroidectomy for total or hemithyroidectomy at King Abdulaziz University Hospital. The secondary aim was to validate the universally used questionnaires in Arabic so that they can be utilized in the study.

**Materials and Methods**

Ethical approval was obtained from the institutional review board (IRB) of King Abdulaziz University (KAU). Two hundred and eighty-six patients who underwent conventional thyroidectomy for different thyroid disorders from January 2008 to June 2018 were identified from the KAU database. Patients who were at least 6 months post-thyroidectomy were included to give adequate time for scar healing. Patients with uncontrolled diabetes, connective tissue diseases, wound infection, or scar revision were excluded. Incision length usually depends on the patient’s neck size, and the size of the thyroid nodule/mass. Marking at the incision site is usually performed by the primary surgeon in the operating room, if the patient has an obvious skin crease that is appropriately located then a transverse incision is created in a curvilinear fashion on that crease. Wound closure is usually carried out on 3-layers closure technique. Interrupted Vicryl sutures is used to reapproximate the strap muscles, then the platysma is closed by the same technique, finally the skin is closed with continuous subcuticular suture technique and steri-strips is applied over the wound.

**Phase 1: Translation and validation of the questionnaires**

The translation process of the questionnaires—the POSAS and NOSAS—from English (source language) to Arabic (target language) was performed by forward and backward translations by two different bilingual expert translators. Forward translation involved translating the English questionnaires into Arabic (target language). The translated questionnaires (Arabic; target language) were translated backward into the source language (English) by one translator who was unaware of the original version of the questionnaires and the back-translated questionnaires. The two different versions of the original English and English-translated questionnaires were discussed and compared. The Arabic version was revised and modified by the research team. The translators had sufficient knowledge about medical terminology and the elements of the questionnaires in both languages [10].

The validation process was carried out by 30 participants/patients who were informed about the objectives of the study. Pre-testing of the translated questionnaire was performed in order to determine whether all items were understandable and acceptable. The patients filled in the Arabic questionnaire and were then asked to provide feedback about the simplicity of the questions, clear words, and language lucidity [11].

**Phase 2: Collection and utilization of data**

The research purpose, methods, and requirements were explained to the patients. Ample time was given to affirm consent and to ask questions. Patient care was not modified for patients who refused participation in the study and all participants were free to withdraw from the study at any time. Those who had access to the hospital and agreed to participate were asked to come to KAUH ENT clinic at a designated time to complete the satisfaction score questionnaire. The allocated time for sample collection was around one year.

Sixty patients were seen in the Otolaryngology and Head & Neck Surgery Clinic at King Abdulaziz University Hospital at the allocated time of the study who fits the inclusion criteria and agreed to participate. Some patients lost follow up and we were unable to reach them on the available contact information we had at the hospital record The final cohort’s disease and treatment demographics were obtained from the database. Fitzpatrick skin phototype classification (FSPC); a system developed in 1975 by Dr Thomas Fitzpatrick that classifies skin according to the amount of pigmentation it has and its response to ultraviolet (UV) light was determined for all patients using validated questionnaires acquired from previously published papers that were translated into Arabic. Scars were evaluated in two stages. In the first stage, a clinician filled in the Observer scar assessment questionnaire and the patient filled in the Arabic version of the Patient scar assessment questionnaire. In the second stage, the Naïve Observer scar assessment questionnaire was filled in by a naïve viewer. Ratings of disfigurement were measured using the validated Patient and Observer Scar Assessment Scale.
(POSAS) (Fig. 1) and the Naïve Observer Scar Assessment Scale (NOSAS) (Fig. 2).

The POSAS included an objective clinician-directed score (Observer scar assessment scale [OSAS]) and a subjective patient-directed score (Patient scar assessment scale [PSAS]). On a 10-point Likert scale, a 10 indicated the worst imaginable scar or sensation and 1 indicated normal skin. The NOSAS had a 10-point Likert scale, with a score of 1 indicating normal skin and 10 indicating the worst imaginable scar possible. Random
observers who were not routinely exposed to head and neck scars completed the NOSAS form.

Standard statistical analysis was performed to identify patients’ scar satisfaction after collecting the information from the postoperative thyroidectomy patients. Categorical variables were presented in terms of frequencies and percentages, and numerical variables were presented as mean and standard deviations. Cronbach’s α was used to test the reliability of the scales, and intra-class correlation was used to test the inter-rater reliability of the POSAS Patient scale. A Spearman correlation analysis was conducted to assess the relationships between the size of incision and the POSAS Patient, POSAS Observer, Naïve Observer, and skin type scores. Independent samples t-tests were conducted to examine whether the mean POSAS Patient, POSAS Observer, Naïve Observer, and Fitzpatrick scores were significantly different between male and female patients.

Results

Our final cohort included 60 non-consecutive patients, with 76.7% women and 23.3% men and a median age of 43 years, and 45.5% of the patients were type 3 on the Fitzpatrick skin type scale (Table 1).

Of those, 53.3% of the patients had underlying malignant neoplasm of the thyroid while 30% had benign disease. As for the type of surgery majority of the patients underwent Total Thyroidectomy 81.7%, while 8.3% and 10% underwent Subtotal Thyroidectomy and Hemithyroidectomy respectively. The average size of incision was 6.0 ± 2.7 cm, and the maximum incision size was 12 cm (Table 2).

Validity and reliability of the arabic version of the research instruments

A Cronbach’s alpha coefficient was calculated for the POSAS Patient, Observer, and Naïve Observer scales.
and was evaluated using the guidelines suggested by George and Mallery (2016), where >.9 = excellent, >.8 = good, >.7 = acceptable, >.6 = questionable, >.5 = poor, and ≤.5 = unacceptable. All three scales showed either good or excellent reliability in this study. The POSAS Patient scale also showed excellent intra-rater reliability (ICC = 0.949). Table 3 presents the results of the reliability analysis.

**Satisfaction scores**

Patient satisfaction scores were calculated. The maximum possible score was 70 and the minimum possible score was 7. Higher scores reflected greater dissatisfaction, and lower scores reflected greater satisfaction. According to our results, most of the patients were satisfied. The average POSAS Patient score was 12.88 ± 9.6, indicating that most patients were satisfied. Similarly, the average POSAS Observer and Naïve Observer scores were 18.02 and 7.53, respectively. The details are shown in Table 4.

### Table 1  Patient characteristics and scale responses

| Variable                  | n  | %   |
|---------------------------|----|-----|
| Marital status            |    |     |
| Married                   | 46 | 76.7|
| Single                    | 10 | 16.7|
| Widowed or Divorced       |  4 |  6.6|
| Gender                    |    |     |
| Male                      | 14 | 23.3|
| Female                    | 46 | 76.7|
| Fitzpatrick Skin Type     |    |     |
| 1                         |  1 |  1.7|
| 2                         |  3 |  5.0|
| 3                         | 27 | 45.5|
| 4                         | 22 | 36.7|
| 5                         |  7 | 11.7|
| Mean (SD)                 | 43.0 (14.0) | 84–13|
| Age in years              | 28.84 (6.4) | 48.6–13.7|
| Body mass index           | 6.0 (2.7) | 16–3|

### Table 2  Surgical Characteristics

| Variable                  | n  | %   |
|---------------------------|----|-----|
| Diagnosis                 |    |     |
| Benign Neoplasm of Thyroid Gland | 18 | 30 |
| Malignant Neoplasm of Thyroid Gland | 32 | 53.3 |
| Neoplasm of Unknown Behavior of Thyroid Gland | 7 | 11.7 |
| Nontoxic Goiter           |  2 |  3.3|
| Primary Hyperparathyroidism|  1 |  1.7|
| Operation                 |    |     |
| Total Thyroidectomy       | 49 | 81.7|
| Subtotal Thyroidectomy    | 5  | 8.3 |
| Hemithyroidectomy         |  6 | 10  |
| Size of incision (cm)     | 6.0 (2.7) | 16–3|

### Table 3  Reliability of the POSAS patient, observer, and naive observer scales

| Scale                      | No. of Items | Cronbach’s α |
|----------------------------|--------------|--------------|
| POSAS Patient              | 7            | .805         |
| POSAS Observer             | 7            | .903         |
| Naïve Observer             | 4            | .904         |
| Inter-Rater Reliability of POSAS Patient Scale | Average ICC* = 0.949 with 95% CI (0.915–0.970) |

POSAS, Patient and Observer Scar Assessment Scale; ICC, intra-rater reliability

### Table 4  Patient satisfaction scale scores

| Scale                                | Mean (standard deviation) | Max–Min |
|--------------------------------------|---------------------------|---------|
| POSAS Patient Scale Score (Max Possible Score = 60) | 12.88 (9.6) | 60–6    |
| POSAS Observer Scale Score (Max Possible Score = 60) | 18.02 (8.1) | 46–7    |
| Naïve Observer Scale Score (Max Possible Score = 40) | 7.53 (5.5) | 33–1    |

*Note. Due to rounding errors, percentages may not equal 100%.
POSAS, Patient and Observer Scar Assessment Scale

**Correlation analysis**

A Spearman correlation analysis was conducted for the relationships between size of incision and POSAS Patient, POSAS Observer, and POSAS Naïve Observer scores. Cohen’s standard was used to evaluate the strength of the relationship, where coefficients between .10 and .29 represent a small effect size, coefficients between .30 and .49 represent a moderate effect size, and coefficients above .50 indicate a large effect size (Cohen, 1988). A significant positive correlation was observed between incision size and POSAS Observer scale scores ($r = 0.44$, $p < .001$). This correlation indicated that as the size of the incision increased, the POSAS Observer satisfaction scale scores tended to
increase. However, POSAS Patient and Naïve Observer scores were not significantly correlated with the size of the incision. The details are summarized in Table 5.

Cohen’s standard was also used to evaluate the strength of the relationship between skin type scores and POSAS Patient, POSAS Observer, and POSAS Naïve Observer scores. A significant positive correlation was observed between Fitzpatrick Skin Type score and POSAS Observer scores with moderate effect size \( r = 0.262, p = 0.043 \), while no significant correlations were observed between the POSAS Patient and POSAS Naïve Observer Scale scores. Details are shown in Table 6.

### Discussion

The results of our study showed that the average patient satisfaction scale score was 12 points, demonstrating that most patients were satisfied, which is similar to the results of other studies [10]. From observation of our cohort and review of the literature, we found that there was no relationship between patient scar satisfaction and scar length. This may be explained by the fact that the force of retraction on the wound increases in small incisions. This results in worse scar healing and less satisfaction [2, 8]. In our opinion, surgeons should not struggle with very small incisions to obtain a good cosmetic outcome, because increasing the incision with lesser retraction force might actually help obtain a more esthetically pleasing scar.

Furthermore, our results showed that there was no relationship between skin type and patient scar satisfaction. Similar to previous studies, Fitzpatrick skin type had no correlation with better scar healing or patient satisfaction [12, 13]. However, our results were not consistent with a single study where Fitzpatrick skin type 3 showed better scar appearance and patient satisfaction than other skin types [14].

As this is the first study of its type in the region, we have established a validated Arabic version of the universally used questionnaires on scar satisfaction and that alone will be useful for conducting similar studies in Arabic-speaking countries in the future. On the other hand, the sample size was not as anticipated, and although 60 patients was a good sample, it did not help us to reach statistical significance in comparison to other previous studies. The small sample size issue was mostly attributed to the difficulty that many patients had with transportation to our hospital. Increasing the sample size would help us to reach statistical significance to ensure firmer conclusions.

### Conclusion

This study validated the Arabic version of the universally used questionnaires for scar satisfaction. The results showed that most patients were highly satisfied with their neck scars regardless of the length of the scar. We hope that our findings will facilitate and inspire further research into patient postoperative scar satisfaction in Arabic-speaking populations so that the body of knowledge on this topic can increase.

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### Disclosure

The authors declare that they have no competing interests to be disclosed.
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