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Anxiety, Pain and Quality of Life Among Patients Undergoing Nail Surgery: A Prospective, Cross-sectional Study

Tırnak Cerrahisinde Anksiyete, Ağrı ve Yaşam Kalitesinin Değerlendirilmesi: Prospektif, Kesitsel Bir Çalışma

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ABSTRACT Objective: Nail surgery is a part of dermatological surgery and can cause a lot of anxiety in patients. This study aims to determine the anxiety and pain levels of the patients in nail surgery procedure steps and to assess their effects on their lives. **Material and Methods:** Patients aged >14 years admitted to our outpatient clinic between April 2019-2020 and scheduled for nail surgery were included in the study. Anxiety (State and Trait Anxiety Scale), dermatological quality of life (Skindex-16), and pain (Visual Analog Scale 0-10) were recorded before and after nail surgery. **Results:** The patients were most worried about the recurrence of their disease after the procedure (54.17%). Skindex-16 scores in the 31-50 age group were statistically significantly higher than in the other age groups. Preoperative anxiety scores were higher in male patients compared to females (p=0.021). Preoperative anxiety was significantly lower in patients who had previous nail surgery (p=0.018). Preoperative pain scores were negatively correlated with preoperative anxiety (p=0.048). **Conclusion:** Nail surgery is a procedure that can cause anxiety and stress for patients. Being aware of the anxiety and pain of patients due to surgery and the factors affecting them by the dermatologic surgeon can change the attitudes and behaviors towards patients, and the measures to be taken for anxiety and pain can accelerate the recovery of patients.

Keywords: Life quality; nail surgery; anxiety; pain; Visual Analog Scale

ÖZET Amaç: Tırnak cerrahisi, dermatolojik cerrahinin bir parçasıdır ve hastalarda çok fazla anksiyeteye neden olabilir. Bu çalışmanın amacı, hastaların tırnak cerrahisi öncesinde, sırasında ve sonrasında anksiyete ve ağrı düzeylerini ve yaşam kaliteleri üzerindeki etkilerini belirlemektir. **Gereç ve Yöntemler:** Nisan 2019 ve 2020 tarihleri arasında polikliniğimize başvuran ve tırnak cerrahisi planlanan 14 yaş üstü hastalar çalışmaya dâhil edildi. Tırnak cerrahisi öncesinde, sırasında ve sonrasında anksiyete (Anlık ve Sürekli Kaygı Ölçeği), dermatolojik yaşam kalitesi (Skindex-16) ve ağrı (Vizüel Analog Skala 0-10) kaydedildi. **Bulgular:** Hastalar en çok işlem sonrası hastalıklarının nüksetmesinden endişe duyuyorlardı (%54,17). 31-50 yaş grubundaki Skindex-16 puanları diğer yaş gruplarından istatistiksel olarak anlamlı derecede yüksekti. Erkek hastalarda kadınlara göre ameliyat öncesi anksiyete puanları daha yüksekti (p=0,021). Daha önce tırnak cerrahisi geçiren hastalarda cerrahi öncesi anksiyete anlamlı olarak daha düşüktü (p=0,018). Preoperatif ağrı skorları ile preoperatif anksiyete arasında negatif korelasyon vardı (p=0,048). **Sonuç:** Tırnak cerrahisi, hastalar için anksiyete ve strese neden olabilen bir işlemdir. Cerrah tarafından hastaların ameliyata bağlı anksiyete ve ağrılarının ve onları etkileyen faktörlerin farkında olmak hastalara yönelik tutum ve davranışları değiştirebilir, anksiyete ve ağrı için alınacak önlemler hastalarda yara iyileşmesini hızlandırabilir.

Anahtar Kelimeler: Yaşam kalitesi; tırnak cerrahisi; anksiyete; ağrı; Vizüel Analog Skala

Anxiety is a human response to situations of threat, a psychological reaction to stress factors. Surgery may create anxiety for patients during the preoperative and postoperative periods. The anticipation of pain, separation from family, loss of independence, fear of surgical procedures and anesthesia, the possibility of changes in body image, and death are the causes of anxiety.[1,2] Dermatologic interventions are one of the day surgeries that enable patients to be operated on and discharged from the hospital on the

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same day. Dermatologic surgery may create anxiety and stress for patients during the preoperative and postoperative periods.

Nail surgery is a part of dermatologic surgery, which can be very painful and causes a lot of anxiety in patients. Many factors are affecting the patient's anxiety. The anesthesia of the nail with a needle, the pain that may arise from the failure of anesthesia, and the problems that may occur after the nail avulsion are the causes of the patient's anxiety. Self-guided imagery, listening to music, and some medications are the suggested options to reduce anxiety in surgical procedures.[3-5] In addition, since local anesthesia with a needle is often a source of fear, it is reported that needle-free anesthesia can be used in needle-phobic patients.[6]

In previous studies about nail surgery, pain scores were not evaluated, and anxiety was often evaluated in the presurgical period, not during and after surgery. In addition, since the correlation between the quality of life, pain score, and anxiety score was not evaluated in other studies, our study offers a new perspective in this respect.

Our main goal is to determine the anxiety and pain levels of the patients during the nail surgery procedure and to evaluate their effects on their lives. In addition, we aimed to increase the awareness of medical doctors about surgical anxiety and pain of patients, to change their attitudes and behaviors towards patients, and to take precautions for anxiety and pain.

MATERIAL AND METHODS

From April 2019 through April 2020, the patients admitted to the Dermatology Clinic of Health Sciences University İstanbul Training and Research Hospital and be decided to undergo nail surgery with chemical matricectomy were invited to participate in this study. Ethics committee approval was received from Health Sciences University İstanbul Training and Research Hospital Scientific Research and Publication Ethics Board (diary number: 1747, date: 15.03.2019)

This study was a pre-test and post-test design (quasi-experimental) with prospective serial cases.

Inclusion Criteria: Patients who were able to speak, read, and write in Turkish.

Exclusion Criteria: Patients <14 years of age, patients with communication difficulties and mental hindrances, did not fully complete both questionnaires. Breastfeeding and pregnancy. Any known psychological or psychiatric disorder or use of psychiatric medicines (antidepressant and/or anxiolytic drugs). Use of sedatives preoperatively. Those with any subungual tumoral lesions.

PROCEDURE

a) Before Intervention: All patients were verbally informed about nail surgery at the outpatient clinic, and an appointment was scheduled. Also, on the day of the surgery, the patients were administered a standardized written information form about the methods of nail surgery. They completed the written consent form before the procedure. Additionally, written informed permission from parents or legal guardians 14-18 years old participants was obtained before the commencement of the study.

Initially, the patient information form was completed. The first part of the form was completed by a health care provider, addressing the indication of nail surgery, presence of granulation tissue, localization of the surgical area, length of time from recommendation to nail surgery, etc. For the second part of the form, the patients completed a questionnaire assessing demographic and current medical characteristics (age, sex, educational status, and previous nail surgery and/or dermatological intervention, prescribed medications). Afterward, they were asked to complete the Turkish version of the State-Trait Anxiety Inventory (STAI) form and Skindex-16 without any help from health care providers and/or biopsy staff immediately before the intervention. Adequate time and confidentiality are provided for all patients. The pain was scored before intervention on the Visual Analog Scale (VAS) scale 0-10 (0=no pain, 10=worst imaginable pain).

STAI is a self-report scale. It is one of the most common validated tests measuring different aspects of anxiety levels in individuals.[7,8] The STAI includes 40 items measures anxiety among individuals aged 14 years and older. The test has two parts: State/Trait.

The S-part (STAI-S) measures the state of anxiety at that moment. The T-part (STAI-T) measures anxiety generally. STAI-S has a four-point Likert format with the following response scale: not at all, somewhat, moderately so, and very much so. STAI-T also has a four-point Likert form with a response scale: almost never, sometimes, often, and almost always. The test score ranges from 20 to 80 points, and higher scores show more significant levels of anxiety.[8]

Skindex-16 is a self-report scale assessing impairment of quality of life in patients with dermatological diseases. For determining the quality of life, patients completed the Turkish version of Skindex-16.[9]

b) Intervention: After distal digital wing anesthesia (40 mg lidocaine plus 0.025 mg adrenaline/2 mL) with a 26-gauge insulin syringe total nail avulsion and total chemical matricectomy with phenol 88% for onychogryphosis; lateral nail avulsion and lateral chemical matricectomy for onychocryptosis and pincer nail; only complete nail avulsion for retronychia were performed. The pain was scored on the VAS scale during nail surgery.

c) After Intervention: Immediately after nail surgery, STAI forms were completed again, and VAS scores for pain were recorded.

EVALUATED PARAMETERS

Patient Information Form

Physician Report: Indication of nail surgery, presence or absence of granulation tissue, presence of infection, localization of the nail surgery, length of time from recommendation to the appointment for nail surgery.

Self-report: Age, sex, education levels, socioeconomic status, previous surgery and/or nail surgery and/or dermatological intervention (themselves or relatives), source of information about the surgical process (internet/social media/video), concomitant disorders, any use of medication. And some statements in five-point Likert format (1: not at all; 5: very much so): I am worried about the intervention, I am afraid of pain during/after surgery, I am afraid of any problem during surgery, I am afraid of the risk of infection, I have aesthetic concerns, I am afraid of bleeding, I am afraid of the recurrence of the disease.

Pain, Anxiety, Quality of Life: VAS score (0-10), STAI score (before and after nail surgery), Skindex-16 score.

STATISTICAL ANALYSIS

Statistical analyses were performed with statistical software SPSS 15.0. Comparisons between two independent groups were made by Student's t-test and by Mann-Whitney U test. More than two-group comparisons of numerical variables were made with One-way ANOVA when the normal distribution condition was met in the groups and the Kruskal-Wallis test when the normal distribution condition was not met. Subgroup analyzes were made with the Mann-Whitney U test and interpreted with Bonferroni correction. In the dependent groups, the numerical variables were analyzed with Paired t-test in two dependent groups by repeated measurement variance analysis in more than two groups, since the differences provided the normal distribution condition. When the parametric test condition between numerical variables was met, it was examined with Spearman correlation analysis when it was not supplied with Pearson correlation analysis. The statistical alpha (level of significance) level was accepted as $p<0.05$.

RESULTS

Sociodemographic and Clinical Characteristics

A total of 49 patients were enrolled in the study. The mean age was 33.3±19.4 (14-89) years, 38.8% (n=19) of the patients were female, 61.2% (n=30) were male. The diagnoses were onychocryptosis (89.8% (n=44)), onychogryphosis [6.1% (n=3)], pincer nail [2.0% (n=1)], retronychia [2.0% (n=1)].

Of the patients, 28.6% (n=14) had a history of previous nail surgery. 49.0% (n=24) of the patients stated to receive information via the internet before nail surgery. Sociodemographic and clinical characteristics of patients were shown in Table 1.

Patient's Opinion About the Procedure

When the patients were asked about their opinions about nail surgery before the procedure; patients responded as fear of recurrence of the disease

TABLE 1: Demographic and clinical features of patients in nail surgery.

Age		
Mean±SD (minimum-maximum) (years)		33.3±19.4 (14-89)
Waiting time for surgical appointment Mean±SD (minimum-maximum) (hours)		127.9±85.2 (1-360)
		n (%)
Age group (years)	<20	18 (36.7)
	21-30	11 (22.4)
	31-50	11 (22.4)
	>50	9 (18.4)
Gender	Female	19 (38.8)
	Male	30 (61.2)
Previously experienced any surgery	Nail surgery	14 (28.6)
	Major surgery	21 (42.9)
	Dermatosurgery	10 (20.4)
Previously any siblings experienced dermatosurgery		8 (16.3)
Source of information	Siblings or friends	11 (22.4)
	Internet	24 (49.0)
	Video	17 (34.7)
Surgical pathology to be performed	Onychocryptosis	44 (89.8)
	Onychogryphosis	3 (6.1)
	Pincer nail	1 (2.0)
	Retronychia	1 (2.0)
Presence of granulation		25 (51.0)
Presence of infection		10 (20.4)
Localization	Right toenail	26 (53.1)
	Left toenail	18 (36.7)
	Both toenail	3 (6.1)
	Right thumbnail	1 (2.0)
	Left thumbnail	1 (2.0)

SD: Standart deviation.

(70.8%), aesthetic anxiety (39.6%), afraid of any problem during surgery (32.7%), worried about the intervention (30.6%), afraid postoperative pain (29.2%), afraid of bleeding (28.6%), afraid of infection risk (26.5%). The most common answer given when the patients were asked in the form of an open triple question; was a fear of needle (47.8%).

Comparison of Pain, Anxiety, and Quality of Life Scores in Nail Surgery Procedure Steps

VAS score after nail surgery was statistically significantly lower compared to the preoperative surgical procedure (p<0.001). STAI-S score after nail surgery was found to be statistically significantly higher than preoperative STAI-S score (p=0.003) (Table 2).

The preoperative VAS score was statistically significantly negatively correlated with the preoperative STAI-S scale (p=0.048). The VAS score during surgery revealed a positive, statistically significant relationship with the postoperative VAS score (p<0.001).

There was a statistically significant difference in STAI-T scores before surgery by age. The mean preoperative STAI-T score between 31-50 years was statistically significantly higher than the other age groups (p=0.001). The mean preoperative STAI-S score of the male gender was statistically significantly higher than the female gender (p=0.021) (Table 3).

The preoperative STAI-S scores of those who had undergone dermatological surgery were statisti-

TABLE 2: VAS, STAI-S, and STAI-T scores of patients.

		Mean±SD	Minimum-Maximum
VAS	Before nail surgery	5.39±2.78¥	0.2-9.6
	After nail surgery	2.63±2.24	0-9.7
	p value*	**<0.001**	
STAI S	Before nail surgery	39.5±7.4¥	21-53
	After nail surgery	44.2±7.6	26-68
	p value#	**0.003**	
STAI T	Before nail surgery	46.6±7.9	30-73
	After nail surgery	45.3±6.7	25-58
	p value#	**0.368**	

*Repeated-measures analysis of variance; ¥Different after nail surgery; #Paired t-Test; VAS: Visual Analog Scale; STAI-S: State-Trait Anxiety Inventory (at that moment); STAI-T: State-Trait Anxiety Inventory (generally); SD: Standart deviation.

TABLE 3: STAI-S and STAI-T evaluations according to demographic features of the patients.

		STAI-S		STAI-T	
		Before nail surgery	After nail surgery	Before nail surgery	After nail surgery
		Mean±SD	Mean±SD	Mean±SD	Mean±SD
Age groups (years)	<20	40.1±6.6	44.1±4.1	44.5±4.7	44.1±6.3
	21-30	40.8±8.0	47.3±5.7	44.4±5.1	47.2±5.6
	31-50	38.1±8.2	39.8±6.7	55.0±10.5	46.6±5.9
	>50	38.2±8.3	45.3±12.9	44.3±7.5	43.8±9.4
	p value	0.796ø	0.184ø	**0.001ø**	0.584ø
Gender	Female	36.3±7.9	42.9±6.2	47.9±9.0	44.9±5.7
	Male	41.4±6.6	44.8±8.3	45.9±7.2	45.6±7.3
	p value	**0.021***	0.459*	0.684#	0.756*

øOne-way ANOVA; *Student's t-test; #Mann-Whitney U test; SD: Standart deviation.

cally significantly lower than those who did not have a history of previous dermatological surgery (p=0.015). The preoperative STAI-T scores of patients who had previous nail surgery were statistically significantly lower than those without previous nail surgery (p=0.027). The source of information about the surgical process (internet/social media/video) did not affect the anxiety level of nail surgery (Table 4).

The mean waiting time for the nail surgical appointment in patients with ingrown nails was 127.87±85.26 hours. There was a weak correlation between the waiting time of the patients and their mean STAI-S and STAI-T scores (r=0.208 p=0.157 and r=0.256 p=0.079). The mean waiting time of females was 109.94±56.63, and males were 139.23±98.46 hours. Also, there was no weak correlation between the waiting time of females and males and their STAI-S and STAI-T scores. (r=0.325 p=0.188 and r=0.162 and p=0.391).

The results of the Skindex-16 scale applied to evaluate how the ingrown nail requiring surgery affects the quality of life were shown in Table 5. In the demographic characteristics of the patients, a statistically significant difference was found only in the age groups in functional Skindex-16 levels (p=0.026). The functional Skindex-16 levels of the 31-50 years age group were statistically significantly higher than that of the patients above 20 years of age (p=0.036) (Table 5).

DISCUSSION

Anxiety is a feeling for situations of uncomfortable expectations. Surgery may create anxiety for patients, and it may sometimes cause refusal of the interven-

TABLE 4: STAI-S and STAI-T evaluations according to surgical experiences.

		Before nail surgery Mean±SD	After nail surgery Mean±SD	Before nail surgery Mean±SD	After nail surgery Mean±SD
Previously experienced nail surgery	Yes	38.1±8.5	48.2±8.3	42.9±4.4	45.9±5.9
	No	40.0±7.0	42.3±6.6	48.2±8.6	45.0±7.1
	p value	0.430*	**0.018***	**0.027#**	0.698*
Previously experienced major surgery	Yes	37.9±8.5	43.3±10.7	46.5±9.5	45.3±8.2
	No	40.6±6.5	44.7±5.3	46.8±6.7	45.3±5.9
	p value	0.203*	0.570*	0.690#	0.971*
Previously experienced dermatosurgery	Yes	34.1±9.2	46.8±12.2	47.3±6.5	44.5±6.5
	No	40.7±6.5	43.5±6.1	46.5±8.3	45.5±6.8
	p value	**0.015***	0.291*	0.614#	0.706*
Previously any siblings experienced dermatosurgery	Yes	35.0±9.9	46.2±4.3	45.3±2.6	45.8±4.4
	No	40.2±6.8	43.8±8.0	46.9±8.5	45.2±7.1
	p value	0.084*	0.494*	0.895#	0.841*
Previously any siblings gave information about	Yes	39.2±10.8	46.1±4.3	44.8±2.5	44.1±6.9
nail surgery n (%)	No	39.6±6.5	43.7±8.2	47.1±8.8	45.6±6.7
	p value	0.889*	0.314*	0.419#	0.766*
Get information from the internet	Yes	39.5±8.5	43.5±5.4	47.3±5.1	44.5±6.2
	No	39.5±6.5	44.9±9.3	46.0±9.9	46.1±7.2
	p value	0.901*	0.619*	0.541#	0.174*
Get information from video	Yes	40.7±7.5	43.7±5.2	46.4±4.3	44.5±7.1
	No	38.8±7.4	44.4±8.8	46.8±9.4	45.8±6.6
	p value	0.437*	0.839*	0.833#	0.400*

*Student's t-test; #Mann-Whitney U test; SD: Standard deviation; STAI-S: State-Trait Anxiety Inventory (at that moment); STAI-T: State-Trait Anxiety Inventory (generally).

TABLE 5: Skindex-16 evaluations of according to demographic features of patients.

		SKINDEX Symptom Mean±SD	Emotional Mean±SD	Functional Mean±SD	Total Mean±SD
All patients (minimum-maximum)		33.7±18.9 (0-66.6)	36.7±18.1 (4.8-66.6)	24.6±20.3 (0-66.6)	95.1±47.9 (14.3-199.8)
Age groups (years)	<20	30.1±19.6	38.7±19.0	19.1±21.4	87.8±53.4
	21-30	35.9±14.1	35.0±15.9	17.9±12.7	88.8±34.5
	31-50	37.8±21.7	44.5±15.4	40.0±14.2	122.3±46.0
	>50	33.3±20.6	25.4±18.3	25.2±24.2	83.8±47.1
	p value	0.728Ø	0.112Ø	**0.026Ø**	0.199¥
Gender	Female	30.0±19.7	42.1±18.8	28.4±22.6	100.5±55.1
	Male	36.1±18.3	33.4±17.1	22.2±18.7	91.6±43.3
	p value	0.278*	0.102*	0.399#	0.236*

ØOne-way ANOVA; ¥Kruskal-Wallis test; *Student's t-test; #Kruskal-Wallis test; SD: Standard deviation.

tion necessary for diagnosis and/or treatment of diseases. Many factors affect people's anxiety, and awareness of these factors allows us to understand better the patient's biological, psychological, and social status. We are going to intervene and help them in a better way.

Nail surgery is performed for both diagnostic and therapeutic purposes. Ingrown toenails-ony-

chocryptosis-is a common cause of nail surgery.[10] It is formed due to the lateral folds of the nail entering the surrounding soft tissue and curving of the nail plate. It causes discomfort and pain, which may prevent walking of the patients, and besides, it may lead to poor quality of life and may contribute to anxiety and depression.[11] In the treatment of the disease, as in our nail surgery practice, lateral nail avulsion with chemical matricectomy with 88% phenol is performed.[12,13]

It is known that all surgical interventions can cause anxiety, whether in local anesthesia or general anesthesia. In the melanoma sentinel lymph node sampling, the patients' blood cortisol level has been shown to correlate with anxiety. Patients in local anesthesia have higher blood cortisol levels; thus, anxiety is higher than patients with general anesthesia.[14]

Dermatological interventions can be evaluated as day surgical interventions under local anesthesia. Interestingly, anxiety of our patients who underwent nail surgery were close to the anxiety of the patients who underwent breast biopsy or bone marrow biopsy.[15,16] Göktay et al. stated that what patients fear most is the needle.[17] In the literature, it is reported that needle-free anesthesia options are also available for patients with needle phobia.[6] In our study, approximately half of the patients, stated that what they have a fear of the needle. However, In our study, patients reported that they mainly feared the recurrence of the disease after the procedure. As far as we know, this is the first study questioning recurrence.

Ingrown toenails have an impact on the quality of life that ranges from moderate to severe.[18] Studies show the effect of the disease on quality of life and the change in life quality after nail surgery.[18,19] Ingrown toenails cause pain, inflammation, infection, limitations in daily activities, and promote school and work absenteeism, directly affecting the patient's quality of life.[18] In a study about ingrown toenails, the patient with the female sex, younger age, and severe clinical classification had a higher impact on quality life scores.[18] We observed higher functional Skindex-16 levels in the 31-50 years age group in our study, but we did not observe any relationship with sex. It was considered that this age group was active in working life. As shown in the study of Chren et al., Functional skin index levels are found in the ingrown nail as well as eczematous dermatitis, while higher functional index levels are observed in basal cell carcinoma actinic keratosis and benign growths.[20]

Sociodemographic characteristics that might affect anxiety levels among patients and awareness of these factors can be a guide for clinicians' approach to the patients. Göktay et al. did not find a difference between anxiety levels and the patients' age, gender, and educational status.[17] Cooke et al. found that the preoperative mean anxiety score was independent of the patients' age, sex, and even the type of surgical procedure (orthopedics, skin, breast, general, urology, other) in patients scheduled for daily surgery.[21] Augustin et al. reported that anxiety was higher in female patients undergoing nevus excision; however, they showed that this score is independent of age.[22] In our study, contrary to these publications, preoperative state anxiety of the male patients was significantly higher than female. Apart from sociodemographic characteristics, the waiting time until the procedure may also affect the anxiety levels. When the female patients who were planned to have a biopsy for the breast were evaluated, it was found that anxiety increased with increasing waiting time in patients.[23,24] However, in our study, there was no significant difference in anxiety scores between genders according to the waiting time.

The state-anxiety scale evaluates present anxiety level; the trait-anxiety scale evaluates general states of calmness, confidence, and security. Wetsch et al. revealed that state anxiety mean scores of day surgery patients were higher than their trait anxiety mean scores.[25] Alacadag et al. found that the state anxiety scores were lower than the trait anxiety score in patients scheduled for daily surgery.[26] In our study, it was observed that the state anxiety score was lower than the trait anxiety score, and no correlation was observed between the two scores. This suggests that patients are worried about interventional procedures, regardless of their average level of general concern.

The literature emphasized that there is a relationship between pain scores in surgical procedures

and anxiety. Therefore, it is necessary to be paid attention to reducing anxiety levels of patients to them feel less pain.[15,27-29] Robleda et al. evaluated the effect of preoperative emotional state on postoperative pain after orthopedic and trauma surgery; and patients with higher pre-surgery anxiety levels had more pain later.[30] No similar relation was observed in our study. However, in our study, preoperative pain score was negatively correlated with preoperative anxiety. This can be explained by the fact that patients want to be treated as soon as possible, as the disease affects the quality of life and working lives of the young-working population.

Experiences in human life can affect our emotions and behaviors, which is also valid for interventional surgical procedures. In our study, the preoperative STAI-S scores of those who had undergone dermatological surgery (other than nail surgery) were statistically significantly lower than those who did not have a history of previous dermatological surgery. Still, there were no significant differences in anxiety scores between first-timers and patients with previous nail surgical experience. Göktay et al. have stated that there was no significant difference between first-timers and patients who had previous nail surgery. But; the study did not question other dermatological interventional procedures.[17]

Miller et al. did not mention the intervention itself in imaging-guided breast procedures and reported that the level of anxiety in women decreased but not be eliminated after the biopsy.[16] Because the uncertainty of the biopsy result was interpreted as a cause for concern.

Unlike most studies reported, our patient population showed higher postoperative anxiety than preoperative (STAI-1: 39.5 vs. 44.2). It was an unexpected result for us. Endogenous catecholamines released during the nail surgery procedure and adrenaline used for the procedure may be responsible.[31] In addition, the score was measured immediately after surgery; it may be better to score the anxiety level after a while.

The limitation of our study was that other nail surgery applications except for nail avulsion were not included in the study. However, some of these interventions are performed for diagnostic purposes. This group was not included in the study because of the concern that the biopsy result may be malignant, and it may also affect the levels of anxiety.

CONCLUSION

Nail surgery may create anxiety and stress for patients during the preoperative and postoperative periods. Awareness of the surgical anxiety and pain of the patients and understanding of the factors affecting anxiety by physicians can also change attitudes and behaviors towards patients, and precautions for anxiety and pain can speed up the recovery of patients.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

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REFERENCES

1. Bailey L. Strategies for decreasing patient anxiety in the perioperative setting. AORN J. 2010;92(4):445-57 quiz 458-60. Erratum in: AORN J. 2010;92(6):708. [Crossref] [Pubmed]
2. Bellani ML. Psychological aspects in day-case surgery. Int J Surg. 2008;6 Suppl 1:S44-6. [Crossref] [Pubmed]
3. Shenefelt PD. Anxiety reduction using hypnotic induction and self-guided imagery for relaxation during dermatologic procedures. Int J Clin Exp Hypn. 2013;61(3):305-18. [Crossref] [Pubmed]
4. Vachiramon V, Sobanko JF, Rattanaumpawan P, Miller CJ. Music reduces patient anxiety during Mohs surgery: an open-label randomized controlled trial. Dermatol Surg. 2013; 39(2):298-305. [Crossref] [Pubmed]
5. Ravitskiy L, Phillips PK, Roenigk RK, Weaver AL, Killian JM, Hoverson Schott A, et al. The use of oral midazolam for perioperative anxiolysis of healthy patients undergoing Mohs surgery: conclusions from randomized controlled and prospective studies. J Am Acad Dermatol. 2011;64(2):310-22. [Crossref] [Pubmed]
6. Patakfalvi L, Benohanian A. Needle-free anaesthesia, a promising option for the needle-phobic patient. Br J Dermatol. 2014; 170(5):1191-2. [Crossref] [Pubmed]
7. Spielberger CD, Gorsuch RL, Lushene RE. Manual for the State-Trait Anxiety Inventory. Palo Alto. CA: Consulting Psychologists Press; 1970. [Link]
8. Öner N, Le Compte VA. Durumluk-Sürekli Kaygı Envanteri El Kitabı. 2. Baskı. İstanbul, Turkey: Bogazici University; 1985. [Link]
9. Aksu AEK, Saraçoğlu ZN, Sabuncu İ, Chren MM, Tozun M. [Validity and reliability of the Turkish version of the Skindex-16]. Turkderm. 2016;50(3):109. [Crossref]
10. DeLauro NM, DeLauro TM. Onychocryptosis. Clin Podiatr Med Surg. 2004;21(4):617-30, vii. [Crossref] [Pubmed]
11. Shivarathre DG, Howard N, Krishna S, Cowan C, Platt SR. Psychological factors and personality traits associated with patients in chronic foot and ankle pain. Foot Ankle Int. 2014;35(11):1103-7. [Crossref] [Pubmed]
12. Becerro de Bengoa Vallejo R, Losa Iglesias ME, Alou Cervera L, Sevillano Fernández D, Prieto Prieto J. Total nail ablation for onychodystrophy with optimized gauze-phenol application. JEADV. 2010;24(8):936-42. [Crossref] [Pubmed]
13. Baran R. The nail in the elderly. Clin Dermatol. 2011;29(1):54-60. [Crossref] [Pubmed]
14. Jansen P, Stoffels I, Müseler AC, Petri M, Brinker TJ, Schedlowski M, et al. Salivary cortisol levels and anxiety in melanoma patients undergoing sentinel lymph node excision under local anesthesia versus general anesthesia: a prospective study. World J Surg Oncol. 2020;18(1):53. [Crossref] [Pubmed] [PMC]
15. Kuivalainen AM, Pitkäniemi J, Widenius T, Elonen E, Rosenberg P. Anxiety and pain during bone marrow aspiration and biopsy. Scand J Pain. 2012;3(2):92-6. [Crossref] [Pubmed]
16. Miller LS, Shelby RA, Balmadrid MH, Yoon S, Baker JA, Wildermann L, et al. Patient anxiety before and immediately after imaging-guided breast biopsy procedures: impact of radiologist-patient communication. J Am Coll Radiol. 2013;10(6):423-31. [Crossref] [Pubmed]
17. Göktay F, Altan ZM, Talas A, Akpınar E, Özdemir EÖ, Aytekin S. Anxiety among patients undergoing nail surgery and skin punch biopsy: effects of age, gender, educational status, and previous experience. J Cutan Med Surg. 2016;20(1):35-9. [Crossref] [Pubmed]
18. Borges APP, Pelafsky VPC, Miot LDB, Miot HA. Quality of life with ingrown toenails: a cross-sectional study. Dermatol Surg. 2017; 43(5):751-3. [Crossref] [Pubmed]
19. Becerro de Bengoa Vallejo R, López López D, Palomo López P, Soriano Medrano A, Morales Ponce Á, Losa Iglesias ME. Quality of life improvement in aged patients after toenail surgery. Z Gerontol Geriatr. 2019;52(8):789-94. [Crossref] [Pubmed]
20. Chren MM, Lasek RJ, Sahay AP, Sands LP. Measurement properties of Skindex-16: a brief quality-of-life measure for patients with skin diseases. J Cutan Med Surg. 2001;5(2):105-10. [Crossref] [Pubmed]
21. Cooke M, Chaboyer W, Schluter P, Hiratos M. The effect of music on preoperative anxiety in day surgery. J Adv Nurs. 2005;52(1):47-55. [Crossref] [Pubmed]
22. Augustin M, Zschocke I, Godau N, Buske-Kirschbaum A, Peschen M, Sommer B, et al. Skin surgery under local anesthesia leads to stress-induced alterations of psychological, physical, and immune functions. Dermatol Surg. 1999;25(11):868-71. [Crossref] [Pubmed]
23. Hayes Balmadrid MA, Shelby RA, Wren AA, Miller LS, Yoon SC, Baker JA, et al. Anxiety prior to breast biopsy: Relationships with length of time from breast biopsy recommendation to biopsy procedure and psychosocial factors. J Health Psychol. 2017;22(5):561-71. [Crossref] [Pubmed]
24. Lebel S, Jakubovits G, Rosberger Z, Loiselle C, Seguin C, Cornaz C, et al. Waiting for a breast biopsy. Psychosocial consequences and coping strategies. J Psychosom Res. 2003;55(5):437-43. [Crossref] [Pubmed]
25. Wetsch WA, Pircher I, Lederer W, Kinzl JF, Traweger C, Heinz-Erian P, et al. Preoperative stress and anxiety in day-care patients and inpatients undergoing fast-track surgery. Br J Anaesth. 2009;103(2):199-205. Erratum in: Br J Anaesth. 2010;105(6):878. [Crossref] [Pubmed]
26. Alacadag M, Cilingir D. Presurgery anxiety and day surgery patients' need for information. J Perianesth Nurs. 2018;33(5):658-68. [Crossref] [Pubmed]
27. Ozalp G, Sarioglu R, Tuncel G, Aslan K, Kadiogullari N. Preoperative emotional states in patients with breast cancer and postoperative pain. Acta Anaesthesiol Scand. 2003;47(1):26-9. [Crossref] [Pubmed]
28. Keogh E, Barlow C, Mounce C, Bond FW. Assessing the relationship between cold pressor pain responses and dimensions of the anxiety sensitivity profile in healthy men and women. Cogn Behav Ther. 2006;35(4):198-206. [Crossref] [Pubmed]
29. van Wijk AJ, Makkes PC. Highly anxious dental patients report more pain during dental injections. Br Dent J. 2008;205(3):E7; discus sion 142-3. [Crossref] [Pubmed]
30. Robleda G, Sillero-Sillero A, Puig T, Gich I, Baos JE. Influence of preoperative emotional state on postoperative pain following orthopedic and trauma surgery. Rev Lat Am Enfermagem. 2014;22(5):785-91. [Crossref] [Pubmed] [PMC]
31. McCall JG, Al-Hasani R, Siuda ER, Hong DY, Norris AJ, Ford CP, et al. CRH engagement of the locus coeruleus noradrenergic system mediates stress-induced anxiety. Neuron. 2015; 87(3):605-20. [Crossref] [Pubmed] [PMC]