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Original Article

Mucocutaneous Findings and Endocrinopathies in Children with Turner Syndrome: A Cross-Sectional Study

Temiz SA et al. Cutaneous Findings in Turner Syndrome

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What is already known on this topic?
• Turner syndrome (TS) is characterized by a constellation of morphological clinical features, including short stature, webbed neck, low posterior hairline, and widely spaced nipples.
• Existing literature documents associations between TS and increased melanocytic nevi, halo nevi, ichthyotic changes, pilomatricoma, café-au-lait spots, and hypertrichosis. However, oral mucosa and nail findings in Turner syndrome have not been mentioned in the literatüre.
• Endocrinopathies are common in Turner syndrome. The relationship between these endocrinopathies and cutaneous findings is not clear in the literature. Are cutaneous findings more common in TS patients with endocrinopathy?

What does this study add on this topic?
• Oral mucosal findings were present in 17% of TS children. The most frequent findings were geographic tongue, fungiform papilla hypertrophy, atrophic glossitis, and scrotal tongue. There are no known studies specifically examining oral mucosal findings in TS patients, making our study the only one on the subject.
• In this study, nail findings were seen in 63.4%, with leukonychia most frequently observed, followed by subungual hyperkeratosis and pincer nail, a characteristic TS finding.
• The significant association between skin and hair findings and concomitant endocrinopathies (p=0.001) observed in this study supports this hypothesis.

Abstract
Objective: This study aims to investigate the frequency of skin, hair, nail, and mucosal findings in children with Turner Syndrome (TS) and their associations with coexisting endocrinopathies.
Methods: A cross-sectional study was conducted on 112 TS patients who were followed up by pediatric endocrinology and referred to the dermatology outpatient clinic. Data were collected using standardized dermatological examination forms, including demographic information, clinical features, presence of endocrinopathies, and medication usage. The SPSS software was used to evaluate differences between groups and to analyze relationships between variables.
Results: Skin and hair findings were detected in 86.6% of the patients, with melanocytic nevi (44.6%) and xerosis (41.1%) being the most commonly observed. Oral mucosal findings were observed less frequently (17.0%). Nail findings were detected in 63.4% of the cases, with leukonychia (15.2%) and subungual hyperkeratosis (14.3%) being the most prevalent. Older age, delayed diagnosis, longer follow-up duration, and lower body mass index were associated with an increased frequency of skin and hair findings ($p < 0.05$). Additionally, the presence of coexisting endocrinopathies was significantly associated with skin and hair findings. Nail findings were significantly associated with longer follow-up duration ($p = 0.002$), the presence of endocrinopathies ($p < 0.001$), and comorbidities ($p = 0.004$).
Conclusion: This study revealed that skin, hair, and nail abnormalities are commonly observed in Turner Syndrome. The association of these findings with endocrinopathies suggests that systemic factors influence dermatological problems in TS. It is recommended to integrate dermatological evaluations into the routine endocrine and cardiological follow-up of children with Turner Syndrome.
Keywords: Turner syndrome, skin findings, endocrinopathies, melanocytic nevus, nail findings.

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Introduction

Turner syndrome (TS) is a genetic disorder that affects females and is caused by the complete or partial loss of one X chromosome. It is one of the most common chromosomal anomalies (1). The syndrome is characterized by a range of morphological clinical features (stigmata), including short stature, webbed neck, low posterior hairline, and widely spaced nipples (1). Additionally, affected individuals frequently present with linear growth retardation, gonadal dysgenesis, hypothyroidism, osteoporosis, and skeletal, cardiovascular, and renal anomalies. Early-onset sensorineural hearing loss, as well as neurocognitive and psychosocial issues, are also common systemic manifestations (2). Although skin, hair, nail, and mucosal changes are commonly seen in TS, these findings are often under-recognized during patient follow-up. In the largest multicenter cohort reported from Turkey, dermatological problems were reported in 21.8% of cases (3). Existing literature has documented associations between TS and increased melanocytic nevi, halo nevi, ichthyosiform changes, pilomatricomas, café-au-lait spots, and hypertrichosis(4-7) . However, a comprehensive understanding of the relationship between these dermatological findings and coexisting endocrinopathies remains limited. Moreover, the increased predisposition to autoimmunity in TS may elevate the risk of conditions such as vitiligo and alopecia areata (8, 9). Nevertheless, strong evidence-based data supporting these associations are lacking.

In particular, studies investigating oral mucosal and nail findings in individuals with TS are quite limited. This study aims to comprehensively evaluate skin, hair, nail, and mucosal findings in children with TS followed in a pediatric endocrinology clinic and to investigate the potential associations between these findings and coexisting endocrinopathies. Enhancing the knowledge base regarding these findings may significantly contribute to improving diagnostic and therapeutic approaches for children with TS.

Materials and Methods

This study involved a cross-sectional assessment of cutaneous, hair, nail, and mucosal findings in children diagnosed with TS. The study population comprised 112 individuals with TS, all of whom were followed by a pediatric endocrinologist and subsequently referred to the dermatology outpatient clinic. Findings were collected from nine tertiary care centres. Exclusion criteria included: age over 18 years, male sex, pregnancy, lactation, prior epilation, and use of oral contraceptives, corticosteroids, cyclosporine, or spironolactone within the preceding three months.

All participants underwent thorough dermatological evaluations performed by a senior dermatologist, utilizing standardized examination forms and routine dermatological examination techniques. Pertinent clinical data, including age, age at diagnosis, follow-up duration, medication history, height, weight, body mass index (BMI), comorbidities, and endocrinopathies (diabetes, hyperlipidemia, hypertension, thyroid disease), were systematically recorded. Standardized methods were consistently employed for dermatological evaluations across all participants. Informed consent was obtained from all participants and their parents prior to enrollment. Ethical approval was granted by the XXXXXX University Ethics Committee (2021/05-25).

Statistical Analysis

Data analysis was performed using SPSS (Statistical Package for the Social Sciences) version 18.0 (SPSS Inc., Chicago, Ill., ABD). Statistical methods were employed to assess intergroup differences and analyze relationships between variables. Descriptive statistics included frequencies (n) and percentages (%) for categorical variables, and means ± standard deviations (SD) and interquartile ranges (IQR, 1st-3rd quartile) for numerical variables. Categorical variable distributions were examined using Pearson's Chi-square test and Fisher's Exact test. For non-normally distributed numerical variables, comparisons between two independent groups were performed using the Mann-Whitney U test, and comparisons among more than two independent groups were conducted using the Kruskal-Wallis test. In cases where the Kruskal-Wallis test yielded significant results, post hoc analysis was performed using the Mann-Whitney U test with Dunn-Bonferroni correction. A p-value of <0.05 was considered indicative of statistical significance for all analyses.

Results

This study encompassed 112 children and adolescents diagnosed with Turner syndrome. Comprehensive examinations were conducted to assess skin, hair, oral mucosa, and nail characteristics. Table 1 presents the distribution of demographic and clinical characteristics. The mean age of participants was 13.33 ± 4.6 years. Karyotype analysis revealed the presence of 45,X in 48.2% (n=54) of cases, mosaic X chromosome in 32.1% (n=36), and X chromosome anomalies in 7.1% (n=8). Comorbidities were evident in 39.3% (n=44) of the Turner syndrome cohort, with cardiopathy representing the most common comorbidity (15.2%, n=17). Growth hormone (GH) therapy constituted the predominant treatment modality, administered to 50.0% (n=56) of the patients.

Dermatological findings are summarized in Table 2. Skin and hair abnormalities were identified in 86.6% (n=97) of the cohort, with melanocytic nevus (44.6%, n=50), xerosis (41.1%, n=46), and keratosis pilaris (25.9%, n=29) representing the most frequent findings. Oral mucosal findings were detected in 17.0% (n=19) of participants, with geographic tongue and fungiform papilla hypertrophy each observed in 3.6% (n=4). Nail findings were observed in 63.4% (n=71) of all cases, the most common ones were, leukonychia (15.2%, n=17), subungual hyperkeratosis (14.3%, n=16), and pincer nail (10.7%, n=12).

Table 3 shows the distribution of skin, hair, and oral mucosal findings in relation to demographic and clinical characteristics. The prevalence of skin and hair abnormalities exhibited statistically significant elevations in cases characterized by older age, delayed diagnosis, longer follow-up duration, and lower BMI ($p<0.001$, $p=0.001$, $p=0.002$, $p=0.049$, respectively). Moreover, cases with concomitant endocrinopathy demonstrated statistically significantly increased prevalence of skin and hair abnormalities ($p=0.001$). Older age and lower BMI were statistically associated with the prevalence of oral mucosal findings ($p=0.002$, $p=0.009$, respectively).

Table 4 presents the distribution of nail findings in relation to the demographic and clinical characteristics of patients with Turner Syndrome. Nail finding prevalence was statistically significantly higher in patients with longer follow-up duration ($p=0.002$) and a higher prevalence of associated comorbidities and endocrinopathies ($p=0.004$, $p<0.001$, respectively). A statistically significant difference was found in age distribution according to the affected nail location ($p=0.044$). Participants with hand nail findings only were younger than those with both hand and foot nail findings ($p<0.05$). In cases with medication use, the prevalence of foot nail findings was statistically significantly higher ($p=0.014$).

Discussion

This study evaluated the frequency of mucocutaneous findings in children with Turner syndrome and their associations with demographic and clinical variables. Skin and hair findings were detected in the majority of cases (86.6%), while nail findings were observed in approximately two-thirds of patients (63.4%). Oral mucosal findings were observed at a lower frequency (17.0%). Our findings suggest that the mucocutaneous spectrum in Turner syndrome is broad, and skin–hair and nail findings should be considered together with accompanying clinical features. The detrimental effects of endocrine disorders on the skin, hair, and mucosal tissues are well known (10, 11). In Turner syndrome, frequently encountered thyroid disorders and growth retardation may also be more commonly associated with mucocutaneous findings (6, 8). Indeed, in our study, the significantly higher frequency of skin–hair findings in the presence of endocrinopathy ($p=0.001$) supports this observation.

While skin–hair findings were associated with older age, diagnostic delay, and presence of endocrinopathy; oral mucosal findings were more related to older age and low BMI. Nail findings significantly increased, particularly in the presence of endocrinopathy and comorbidities, suggesting that nail changes may be one of the most sensitive dermatological indicators of systemic involvement in Turner syndrome.

Prevalence data regarding dermatological findings in Turner syndrome are limited in the literature and vary widely due to methodological differences. Studies based on medical record reviews report lower prevalence rates, while dermatology-focused studies using detailed

physical examination or patient/parent reporting have shown rates of findings such as xerosis and melanocytic nevi reaching 70–80% (3, 8, 12). This discrepancy may be explained by the fact that mild or subclinical findings are not always recorded as “clinical problems” during routine follow-up visits. In our study, the use of a standardized dermatological examination form by a dermatologist likely contributed to the higher detection rates. Additionally, the differences may also be affected by referral bias and inter-center variability in assessment practices.
In our study, the most common skin finding was melanocytic nevi, observed in about half of the patients. Benign acquired nevi were most frequently seen, while dysplastic and congenital nevi were less common. Although previous reports have indicated an increased prevalence of halo nevi in Turner syndrome, this was found in only one case in our study(9). Earlier studies have shown that the average number of nevi is higher in individuals with Turner syndrome compared to the general population (3, 8) . Considering that the total number of melanocytic nevi is an independent risk factor for melanoma, it would be appropriate to include regular nevus monitoring in the follow-up of individuals with Turner syndrome; however, there is currently no clear evidence suggesting a significantly increased risk of melanoma in TS patients (4, 13-15).
Growth hormone (GH) therapy is a commonly used approach in the management of short stature in Turner syndrome and was also the most frequently applied treatment in our study. Although studies evaluating the relationship between GH therapy and the development of melanocytic nevi are limited, some reports suggest that GH treatment may increase the number of nevi in TS (16-18). However, the causal nature of this relationship remains unclear; further studies are needed to determine whether this is due to growth axis abnormalities or the therapy itself.
The frequent occurrence of xerosis cutis and keratosis pilaris among the most common dermatological findings suggests that keratinization processes may be widely affected in Turner syndrome. As Borroni et al. emphasized, skin dryness in TS should not only be considered as nonspecific xerosis but also as a manifestation of ichthyosis-like keratinization disorders(8) . In a more recent study, 78.7% of individuals with Turner syndrome reported complaints of dry, scaly, or flaky skin, with this being one of the factors most affecting quality of life (12). Nonetheless, the pathophysiological relationship between xerosis and Turner syndrome has not yet been fully elucidated.
A large-scale cohort study conducted in Denmark showed that inflammatory skin diseases such as psoriasis, atopic dermatitis, and seborrheic dermatitis were reported at higher rates in individuals with Turner syndrome compared to the general population (19). In our study, the relatively high frequency of seborrheic dermatitis (24.1%) may be considered consistent with literature suggesting that GH and the insulin-like growth factor (IGF) axis affect sebaceous gland function and sebum production (20).
The detection of acne vulgaris in 13.4% of cases in our study suggests that this finding occurs at a relatively low frequency in individuals with Turner syndrome, consistent with existing literature (21). This may be related to reduced sebum production, low peripheral androgen levels, and the suppression of testosterone and dihydrotestosterone levels due to hormone replacement therapy in TS patients (21, 22).
Lymphedema is frequently observed at birth in Turner syndrome and tends to regress in most cases by the age of two. Therefore, its low detection rate (2.7%) in our study was an expected finding.
Among hair-related dermatological findings, telogen effluvium was the most common (8.0%). Hormonal imbalances such as estrogen deficiency, thyroid dysfunction, and abnormalities in the growth axis may affect the hair follicle cycle and increase transition to the telogen phase. This finding indicates that complaints related to hair should be systematically questioned during dermatological evaluations in TS patients.
Oral mucosal findings were observed in 17.0% of Turner syndrome cases in our study. The most common findings included geographic tongue, hypertrophy of fungiform papillae, atrophic glossitis, and fissured tongue. Data evaluating oral mucosal findings in a systematic manner in TS are limited; therefore, our findings contribute to the existing literature. The positive association of oral mucosal findings with age and their negative association with BMI are noteworthy. This relationship may be linked to secondary nutritional deficiencies and micronutrient deficits. Particularly, findings such as atrophic glossitis and angular cheilitis are classic indicators of micronutrient deficiencies. However, due to the lack of biochemical assessments in our study, further investigations are needed to confirm these associations.
Nail findings were observed in 63.4% of children with Turner syndrome in our study. The most frequent nail finding was leukonychia, followed by subungual hyperkeratosis and pincer nails, which are considered characteristic of TS. The significantly higher frequency of nail findings in the presence of endocrinopathy ($p<0.001$) and their strong association with comorbidities ($p=0.004$) suggest that nail changes may be a sensitive marker of systemic disease burden in Turner syndrome.
Circulatory disorders, hormonal imbalances, and connective tissue anomalies commonly reported in TS may negatively affect keratin production and nail structure. Hypoplastic and dysplastic nails have also been reported to be associated with lymphedema in the literature (23). Moreover, the wide and short foot structure common in TS, lymphedema, and hyperextension of the big toe may predispose individuals to mechanical trauma due to increased shoe pressure, potentially contributing to the development of leukonychia, subungual hyperkeratosis, and pincer nails(24).
In our study, the observation that nail findings were more frequent in cases with a longer follow-up duration, and that patients with only fingernail involvement were younger than those with both hand and foot involvement, suggests that nail findings may be related to cumulative systemic and mechanical effects over time. In light of these findings, we believe that nail examination should not be neglected in the dermatological evaluation of individuals with Turner syndrome and should be considered a potential marker of systemic involvement.

Limitations

The main limitation of this study is the lack of a control group, which prevents direct comparison of the observed mucocutaneous findings with their frequencies in the general population. Additionally, the cross-sectional design does not allow for causal inference between dermatological findings and endocrinopathies.
Endocrinopathies and comorbidities were recorded based on clinical diagnoses established by pediatric endocrinology; thyroid autoantibodies, hormone levels, IGF-1 measurements, and/or dynamic endocrine tests were not analyzed within the scope of this study. Thus, findings such as the higher reported frequency of hyperthyroidism compared to hypothyroidism may reflect differences in clinical records or classification rather than true prevalence. Considering that short stature in TS is often due to functional impairment of the growth axis rather than biochemical GH deficiency, some cases recorded as "GH deficiency" may instead reflect growth failure.
Endocrinopathies were not analyzed according to subtypes. The presence of multiple endocrine disorders in many cases may have introduced confounding effects. The complexity resulting from this and the lack of sufficient statistical power for subgroup analyses limited the ability to isolate specific associations between dermatological findings and individual endocrine conditions. Lastly, the absence of biochemical evaluations related to nutritional status and possible micronutrient deficiencies (e.g., iron, B-complex vitamins, zinc) limited the interpretation of the association between low BMI and oral mucosal findings.

Conclusion

Endocrinopathies in individuals with Turner syndrome significantly increase the frequency of dermatological findings, particularly those involving the skin, hair, and nails. Therefore, in addition to routine endocrinology and cardiology follow-ups, regular dermatological evaluations should be integrated into the care of patients with Turner syndrome.

Declaration of generative AI and AI-assisted technologies in the writing process:

During the preparation of this work the authors used Gemini 2.0 Flash Experimental to translate the original manuscript into English and improve readability and language. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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Table 1. Demographic and Clinical Characteristics of Turner Syndrome Cases

Variables		**Results (n=112)**
Age (years); (mean±SD; IQR)		13.33 ± 4.60 (11-18)
Sex; n(%)	**Female**:	112 (100.0)
Karyotype; n(%)	45,X	54 (48.2)
	Mosaicism	36 (32.1)
	X Chromosome Anomaly	8 (7.1)
	Unknown	14 (12.5)
BMI; (mean±SD; IQR)		23.11 ± 18.90
Age at Diagnosis (years); (mean±SD; IQR)		6.93 ± 5.01 (1-11)
Follow-up duration (months); (mean±SD; IQR)		79.17 ± 64.61 (24-120)
Comorbidities; n(%)		44 (39.3)
Cardiopathy		17 (15.2)
Obesity		7 (6.3)
Kidney Anomaly		7 (6.3)
Mental Retardation		7 (6.3)
Celiac Disease		5 (4.5)
Hyperlipidemia		3 (2.7)
Selective IgM Deficiency		2 (1.8)
Allergic Rhinitis		2 (1.8)
FMF		1 (0.9)
Hypertension		1 (0.9)

ALL	1 (0.9)
Endocrinopathies; n(%)	74 (66.1)
GH Deficiency	40 (35.7)
Hyperthyroidism	26 (23.2)
Hypothyroidism	16 (14.3)
Diabetes	6 (5.4)
Osteoporosis	2 (1.8)
Medication Use[(a)]	
Growth Hormone Therapy n(%)	56 (50.0)
Estrogen n(%)	25 (22.3)
Thyroid Medication (Levothyroxine, etc.) n(%)	15 (13.4)
Other n(%)	13 (11.6)
BMI: Body Mass Index, **FMF:** Familial Mediterranean Fever**, ALL:** Acute Lymphocytic Leukemia, **GH:** Growth Hormone Footnote: a) The medication categories are not mutually exclusive; some cases involve the use of more than one medication.	

Table 2. Distribution of Dermatological Findings in Patients

Variables	Results (n=112)	Variables	Results (n=112)
Skin and Hair Findings; n(%)	97 (86.6)		
Melanocytic Nevus	50 (44.6)		
Xerosis	46 (41.1)		
Keratosis Pilaris	29 (25.9)		
Seborrheic Dermatitis	27 (24.1)		
Pruritus	21 (18.8)		
Striae	18 (16.1)	**Nail Findings; n(%)**	71 (63.4)
Acne	15 (13.4)	Leukonychia	17 (15.2)
Telogen Effluvium	9 (8.0)	Subungual Hyperkeratosis	16 (14.3)
Dysplastic Nevus	7 (6.3)	Pincer Nail	12 (10.7)
Atopic Dermatitis	7 (6.3)	Unguis Incarnatus	9 (8.0)
Hypopigmentation	7 (6.3)	Longitudinal Ridging	8 (7.1)
Café-au-lait Spots	7 (6.3)	Terry's Nails	8 (7.1)
Psoriasis	6 (5.4)	Brittle Nails	8 (7.1)
Hirsutism	5 (4.5)	Transverse Ridging	7 (6.3)
Pityriasis Alba	5 (4.5)	Onycholysis	6 (5.4)
Pityriasis Versicolor	5 (4.5)	Pitting	5 (4.5)
Traction Alopecia	4 (3.6)	Increased Nail Curvature	4 (3.6)
Urticaria	4 (3.6)	Trachyonychia	3 (2.7)
Eczema	3 (2.7)	Onychophagia	2 (1.8)
Congenital Nevus	3 (2.7)	Onychomadesis	1 (0.9)
Hemangioma	3 (2.7)	Beau's Lines	1 (0.9)
Alopecia Areata	3 (2.7)	Koilonychia (Spoon Nails)	1 (0.9)
Androgenetic Alopecia	3 (2.7)	Muehrcke's Lines	1 (0.9)
Hyperpigmentation	3 (2.7)	Mees' Lines	1 (0.9)
Lymphedema	3 (2.7)	Lindsay's Nails	1 (0.9)
Acanthosis Nigricans	2 (1.8)	Congenital Malalignment	1 (0.9)
Verruca (Wart)	2 (1.8)	Racquet nail	1 (0.9)
Halo Nevus	1 (0.9)	Other	4 (3.6)
Skin Tag	1 (0.9)		
Trichotillomania	1 (0.9)		
Herpes Labialis	1 (0.9)		
Tinea Pedis	1 (0.9)		
Keloid	1 (0.9)		
Other	11 (9.8)		
Oral Mucosal Findings; n(%)	19 (17.0)	**Affected Nail Location; n(%)**	
Geographic Tongue	4 (3.6)	Hand	12 (10.7)
Fungiform Papilla Hypertrophy	4 (3.6)	Foot	29 (25.9)
Atrophic Glossitis	3 (2.7)	Both Hand and Foot	30 (26.8)
Scrotal Tongue	3 (2.7)		
Candidiasis	2 (1.8)		
Morsicatio Buccarum	2 (1.8)		
Gingival Hypertrophy	2 (1.8)		
Aphthous Ulcer	2 (1.8)	**Number of Affected Nails; (mean±SD; IQR)**	6.81 ± 6.75 (0.7-10.0)
Angular Cheilitis	1 (0.9)		
Exfoliative Cheilitis	1 (0.9)		
Gingival Bleeding	1 (0.9)		
Lichen Planus	1 (0.9)		

Table 3. Distribution of Skin, Hair, and Oral Mucosal Findings According to Demographic and Clinical Characteristics

	Skin & Hair Findings			Oral Mucosal Findings		
	Present	**Absent**	**p**	**Present**	**Absent**	**p**
Age (years); (mean±SD; IQR)	14.36±4.71 (12-17)	6.67±6.45 (1-12)	**<0.001***	16.42±4.61 (15-20)	12.70±5.59 (10-17)	**0.002***

Karyotype; n(%) 45,X Mosaicism X Chromosome Anomaly	 42 (77.8) 34 (94.4) 7 (87.5)	 12 (22.2) 2 (5.6) 1 (12.5)	0.096**	 9 (16.7) 6 (16.7) 0 (0.0)	 45 (83.3) 30 (83.3) 8 (100.0)	0.455**
BMI; (mean±SD; IQR)	21.05±4.47 (17.9-23.5)	36.38±49.78 (15.1-23.6)	**0.049***	22.85±4.06 (20.4-25.8)	23.16±20.68 (17.1-22.9)	**0.009***
Age at Diagnosis (years); (mean±SD; IQR)	7.53±4.91 (3-12)	2.86±3.65 (0-5)	**0.001***	7.53±5.94 (1-12.5)	6.82±4.85 (2.5-11.0)	0.285*
Follow-up Duration (months); (mean±SD; IQR)	84.99±64.15 (36-120)	39.29±54.41 (12-39)	**0.002***	90.06±62.28 (42-144)	77.18±65.15 (24-120)	0.407*
Associated Comorbidity; n(%)	39 (88.6)	5 (11.4)	0.612**	10 (22.7)	34 (77.3)	0.191**
Associated Endocrinopathy; n(%)	70 (94.6)	4 (5.4)	**0.001****	15 (20.3)	59 (79.7)	0.193**
Medication Use; n(%)	76 (89.4)	9 (10.6)	0.190***	16 (18.8)	69 (81.2)	0.556***

n (%); mean±SD; IQR
*: Mann-Whitney U Test
**: Pearson Chi-Square Test
***: Kruskal-Wallis Test

Table 4. Distribution of Nail Findings According to Demographic and Clinical Characteristics

	Nail Findings			**Affected Nail Location**			
	Present	**Absent**	**p**	**Hand**	**Foot**	**Hand+Foot**	**p**
Age (years); (mean±SD; IQR)	14.27±5.32 (11-18)	11.71±5.75 (8-16)	0.068*	12.58±3.26 (11-15)	13.38±4.98 (10-17)	15.80±6.00 (12-20)	**0.044*****
BMI; (mean±SD; IQR)	21.27±4.38 (17.9-23.8)	26.28±30.69 (16.5-21.9)	0.064*	21.78±6.35 (17.2-23.1)	20.83±4.45 (17.2-23.9)	21.49±3.39 (18.7-24.1)	0.641***
Age at Diagnosis (years); (mean±SD; IQR)	6.44±4.69 (1.5-7.0)	7.76±5.46 (1.0-12.5)	0.197*	8.00±3.43 (5-11)	5.90±4.83 (0.4-9)	6.37±4.95 (1-11)	0.454***
Follow-up Duration (months); (mean±SD; IQR)	92.71±67.36 (38-150)	56.39±53.03 (15-78)	**0.002***	57.09±40.71 (36-72)	87.32±67.96 (24-150)	110.80±70.12 (60-162)	0.064***
Comorbidity; n(%)	35 (79.5)	9 (20.5)	**0.004****	4 (11.4)	18 (51.4)	13 (37.1)	0.170**
Endocrinopathy; n(%)	57 (77.0)	17 (23.0)	**<0.001****	9 (15.8)	24 (42.1)	24 (42.1)	0.850**
Medication Use; n(%)	56 (65.9)	29 (34.1)	0.332**	12 (21.4)	25 (44.6)	19 (33.9)	**0.014****

n (%); mean±SD; IQR
*: Mann-Whitney U Test
**: Pearson Chi-Square Test
***: Kruskal-Wallis Test