ISSN 2458-8865 E-ISSN 2459-1505
www.fppc.com.tr
Family Practice & Palliative Care

Research Article

Assessment of the relationship between functional dependency and cognitive status with skin lesions in elderly individuals

Yaşlı bireylerde deri lezyonları ile fonksiyonel bağımlılık ve bilişsel durum arasındaki ilişkinin değerlendirilmesi

Hilal Gürbüz Türkmen[a], Neslihan Kayahan Satış[b], Mehmet İlkin Naharcı[b], Burcu Doğan[a], Oktay Sarı[c]

[a] Department of Family Medicine, Gülhane Training and Research Hospital, University of Health Science, Ankara, Türkiye

[b] Department of Internal Medicine, Division of Geriatrics, Gülhane Training and Research Hospital, University of Health Science, Ankara, Türkiye

[c] Department of Family Medicine, Faculty of Medicine, Çanakkale Onsekiz Mart University, Çanakkale, Türkiye

Abstract

Introduction: Skin lesions observed concomitantly with increasing functional dependency and/or cognitive impairment can lead to significant additional challenges. In this study, we aimed to assess the relationship between functional dependency, cognitive status, and skin lesions in elderly individuals

Methods: Individuals presenting to the geriatric outpatient clinic of a tertiary reference center were included in a cross-sectional study. The level of dependency was determined using the Katz Index of Independence in Activities of Daily Living (ADL) and the Lawton-Brody Instrumental Activities of Daily Living (IADL) scale, classifying individuals as "totally dependent," "partially dependent," or "independent." Cognitive status was assessed using the Standardized Mini-Mental State Examination (MMSE), with scores of 24 and above considered "normal."

Results: Of the 228 individuals included in the study, 63.60% were male, with a mean age of 76.20 (±7.10) years. The three most commonly observed skin findings in the study group were scar (43.90%), xerosis (40.40%), and dermatophytosis (36.40%). It was revealed that the occurrence of xerosis, infection-related lesions, eczema, diabetic foot ulcers, decubitus ulcers, and pruritus was statistically significantly lower in individuals with "totally independent" ADL, "totally independent" IADL, and/or "normal" cognitive function assessed by MMSE.

Conclusion: There is a significant relationship between functional and cognitive status and the occurrence of skin lesions in elderly individuals. Certain skin lesions such as xerosis, infection-related lesions, eczema, diabetic foot ulcers, decubitus ulcers, and pruritus may be particularly common in elderly individuals who are functionally dependent and/or have impaired cognitive functions and should be taken into consideration in clinical practice.

Keywords*:* Elderly individual, functional dependency, cognitive impairment, skin lesions

Öz

Giriş: Artan işlevsel bağımlılık ve/veya bilişsel bozuklukla birlikte görülen cilt lezyonları önemli ek zorluklara yol açabilir. Bu çalışmada, yaşlı bireylerde işlevsel bağımlılık, bilişsel durum ve cilt lezyonları arasındaki ilişkiyi değerlendirmeyi amaçladık

Yöntem: Üçüncü basamak bir referans merkezinin geriatrik polikliniğine başvuran bireyler kesitsel olarak çalışmaya dahil edildi. Bağımlılık düzeyi, Katz Günlük Yaşam Aktivitelerinde Bağımsızlık Endeksi (GYA) ve Lawton-Brody Günlük Yaşamın Enstrümantal Aktiviteleri (IADL) ölçeği kullanılarak belirlendi ve bireyler "tamamen bağımlı", "kısmen bağımlı" veya "bağımsız" olarak sınıflandırıldı. Bilişsel durum, 24 ve üzeri puanların "normal" kabul edildiği Standardize Mini-Mental Durum İncelemesi (MMSE) kullanılarak değerlendirildi.

Bulgular: Çalışmaya dahil edilen 228 bireyin %63,60'ı erkekti ve ortalama yaşları 76,20 (±7,10) yıldı. Çalışma grubunda en sık görülen üç cilt bulgusu yara izi (%43,90), kseroz (%40,40) ve dermatofitoz (%36,40) idi. Kserozis, enfeksiyonla ilişkili lezyonlar, egzama, diyabetik ayak ülserleri, bası yaraları ve pruritusun görülme sıklığının, "tamamen bağımsız" ADL, "tamamen bağımsız" IADL ve/veya MMSE ile değerlendirilen "normal" bilişsel işlevi olan bireylerde istatistiksel olarak anlamlı derecede daha düşük olduğu ortaya çıkmıştır.

Sonuç: Yaşlı bireylerde fonksiyonel ve bilişsel durum ile cilt lezyonlarının görülmesi arasında anlamlı bir ilişki vardır. Kserozis, enfeksiyonla ilişkili lezyonlar, egzama, diyabetik ayak ülserleri, bası yaraları ve pruritus gibi belirli cilt lezyonları, fonksiyonel olarak bağımlı ve/veya bozulmuş bilişsel işlevi olan yaşlı bireylerde özellikle yaygın olabilir ve klinik uygulamada dikkate alınmalıdır.

Anahtar kelimeler: Yaşlı birey, fonksiyonel bağımlılık, bilişsel bozukluk, cilt lezyonları

Received	Accepted	Published Online	Corresponding Author	E-mail
September 27, 2024	November 20, 2024	December 31, 2024	Neslihan Kayahan Satış	neslihan-kayahan@hotmail.com
Correspondence	Neslihan Kayahan Satış. Etlik, Gen. Dr. Tevfik Sağlam Cd No:1, 06010 Keçiören-Ankara, Türkiye			
	https://doi.org/10.22391/fppc.1556884			

Key Points

1. Skin lesions are frequently encountered in older adults.
2. Elderly people with functional independence or cognitive impairment are more likely to experience xerosis, infection-related lesions, eczema, diabetic foot ulcers, decubitus ulcers, and pruritus.

Introduction

Globally and in Türkiye, the population aged 65 and over is increasing day by day. According to the data from the Turkish Statistical Institute (TUIK), the proportion of the elderly population within the total population is projected to rise to 11% by 2025 and 12.9% by 2030 [1]. With age, various physiological changes occur in the body. Alongside an increased prevalence of chronic diseases such as circulatory and respiratory illnesses, malignancies, and diabetes, there are also changes related to the skin. The most notable alterations in the skin during the natural ageing process include dryness, roughness, an increase in wrinkles and brown spots, and sagging and atrophy of the skin due to a decrease in elasticity. Additionally, a lack of responsiveness to repair processes further contributes negatively to this condition. Skin lesions are quite common in the elderly, with some studies reporting a prevalence rate of 70-90% [2]. The most frequently observed skin lesions in elderly individuals are dermatitis, xerosis, pruritus, infectious disease rashes, and benign, malignant, and pre-malignant lesions [3].

In addition to all physiological changes that occur with age, there is also a decline in individuals' functionality, which is defined as "the ability of a person to perform responsibilities and complex social roles necessary in daily life" [4]. Elderly individuals may require support from those around them to carry out daily and instrumental activities of living. In this sense, old age is also seen as a transition period from independence to dependency. There are numerous risk factors for dependency in the elderly, including advanced age, female gender, low education and income levels, chronic diseases (such as cardiovascular diseases, hypertension, diabetes mellitus, and neuropsychiatric diseases), urinary and faecal incontinence, gait and balance disorders, and sensory impairments [5]. Moreover, the increase in cognitive impairment with age can play a role in susceptibility to skin findings, both due to its association with pathological changes such as thinning and drying of the skin, and due to a decrease in self-awareness which can reduce the likelihood of noticing or reporting changes in their skin. Additionally, these individuals may be more prone to neglecting proper skin hygiene, sun protection, and regular skin checks, thereby increasing the risk of skin damage and lesion development [6, 7].

Some of the risk factors that can cause functional dependency, and cognitive decline may also contribute to the development of skin lesions. There are limited studies in the literature assessing the relationship between these conditions [8, 9, 10, 11]. In this study, we aimed to assess the relationship between the level of dependency in daily and instrumental activities of living and cognitive status with skin lesions in patients aged 65 and over.

Methods

Patient Population: This cross-sectional study was conducted between November 2022 and April 2023 at a single tertiary referral center geriatric outpatient clinic. Data collection forms were filled out by the researcher through face-to-face interviews with patients who consented to participate in the study. Sociodemographic data (age, gender, marital status, education level, living arrangements, caregiver), smoking status, chronic diseases (hypertension, diabetes mellitus, cardiovascular disease, cerebrovascular disease, chronic kidney disease, osteoporosis, dementia, depression), medication , and the number of medications were recorded. Additionally, existing skin lesions and diseases in patients were evaluated, and the type and duration since the onset of the lesions were noted. While the diagnosis of lesions was established through inspection and physical examination, patients were referred to the dermatology department as needed to determine their final diagnoses. The skin examination started with general inspection from head to toe, paying close attention to visible areas and progressing to less exposed regions, including intertriginous zones and soles of the feet. This step involves identifying age-related changes such as dryness, thinning, pigmentation changes, and the presence of wrinkles or lesions. Lesion assessment is done by documenting the location, size, shape, color, texture, and distribution of abnormalities, with particular attention to commonly observed conditions such as xerosis and pressure ulcers. High-risk areas like pressure points and intertriginous regions are reviewed for signs of ulcers, moisture-related lesions, or infections. Palpation is used to assess consistency, tenderness, mobility, or induration of lesions, as well as overall skin turgor, which may indicate hydration or nutritional status. A total of 240 individuals volunteered to participate in the study; however, 12 patients were excluded due to serious visual or auditory impairments, delirium, or incomplete data collection forms. The final evaluation was conducted with 228 patients.

Measurement Parameters: All participants who volunteered to join the study were assessed for their levels of dependence in daily and instrumental activities of daily living, using the Katz Index of Independence in Activities of Daily Living (ADL) and the Lawton-Brody Instrumental Activities of Daily Living Scale (IADL) respectively [12, 13]. The Katz ADL scale evaluates the elderly's independence in six parameters: dressing, bathing, toilet use, continence, transfers (moving from bed to chair and back), and feeding [12]. In this scale, a person is given 1 point for independence and 0 points for dependence in each activity, with individuals scoring a total of 6 points considered "completely independent" and those scoring 0 points considered "completely dependent". The Lawton-Brody IADL scale comprises eight components: using the telephone, shopping, doing housework, preparing meals, using transportation, doing laundry, and managing finances [13]. Each item is scored as 0 (unable to do or partially able to do) or 1 (able to do), with total scores ranging from 8 (completely independent) to 0 (completely dependent) [14]. Lower scores on both scales indicate greater dependency [12, 13].

To assess individuals' cognitive status, the Standardized Mini-Mental State Examination (MMSE) was administered. Developed by Folstein et al. in 1975 to assess cognitive status, it is a widely used and easily applicable test for dementia screening [15]. The test evaluates abilities such as orientation, memory, attention, calculation, recall, language, comprehension, and motor function, with a total score out of 30 points. Cognitive impairment is classified as "normal" for scores between 24-30, "mild impairment" for scores between 18-23, and "severe impairment" for scores of 17 and below [16].

Ethical approval, informed consent and permissions

For this research, the Ethics Committee approval was obtained from the Health Sciences Ethics Committee of our University School of Medicine (17/10/2022 dated 09 numbered), and then the research permit approval was obtained from the hospital's chief medical officer. An "informed consent" form was given to the volunteers who participated in the study, and their personal consent was obtained.

Statistical analysis

The Statistical Package for Social Sciences (SPSS) (IBM SPSS Inc., IL, Chicago, U.S.) was used for statistical analysis. The numerical variables were arranged in absolute numbers and percentages, average standard deviations, and medians. The student T-test or the Mann-Whitney U-test were utilized when comparing continuous data. The Kolmogorov-Smirnov test was used to analyze the distribution of data. The chi-square test was used for the comparison of categorical variables. The statistical significance was accepted when the p-value was less than 0.05.

Results

Patient Characteristics: The mean age of the 228 patients included in the study was 76.2 (±7.1) years. Of these individuals, 63.6% were male, and approximately half (55.7%) were married. Regarding educational attainment, 45.2% of the participants completed primary school, with the majority living with their spouse or children; however, 38 participants (16.7%) were living alone. It was found that 68% of the individuals were responsible for their care, and among those requiring care, their children provided the most assistance (25.4%). Detailed data on other sociodemographic characteristics are presented in Table 1.

Patients exhibited a high prevalence of chronic diseases, with 91.3% reporting at least one chronic condition. The most common chronic illnesses identified were hypertension, cardiovascular diseases, and diabetes mellitus, respectively. The mean Katz Index of Independence in Activities of Daily Living (ADL) score was 4.82 (±1.9), the mean Lawton-Brody Instrumental Activities of Daily Living (IADL) score was 5.54 (±3.1), and the mean Standardized Mini-Mental State Examination (SMMT) score was 23.9 (±6.5). A total of 6.6% of the patients were classified as "completely dependent" in ADL, and 14.9% were considered "completely dependent" in IADL. Moreover, 17.5% of participants were assessed as having "severe impairment" according to the SMMT (Table 1).

89.5% of the patients were found to have a dermatological lesion, with a median duration since the appearance of the lesions of 5.2 (range: 1.0-35.0) months. The three most commonly encountered skin findings were scar (43.9%), xerosis (40.4%), and dermatophytosis (36.4%), respectively. The distribution of some other dermatological lesions encountered is presented in Table 2.

Assessment of skin findings according to scales: Patients with and without skin findings were divided into two groups, and the relationship between individuals' dependency status and degrees of cognitive impairment was evaluated. A statistically significant relationship between the absence of skin findings and "complete independence" was only observed in individuals evaluated as EGYA (p=0.016). No significant differences were detected in other cognitive and functional categories. Additionally, the relationship between each identified skin finding and individuals' dependency on daily life activities and cognitive impairment status was assessed. It was revealed that xerosis, lesions associated with infection, eczema, diabetic foot ulcers, decubitus ulcers, and pruritus were statistically significantly less prevalent in individuals categorized as "completely independent" in GYA, EGYA, and/or SMMT. Detailed data regarding subgroup assessments of scales and the relationship with skin findings are presented in Table 3.

Table 1. Descriptive characteristics of the participants

Descriptive characteristics (n= 228)	**n (%)**
Age, year	76.2 (±7.1)
Gender, female	145 (63.6%)
Marital status	
Married	127 (55.7%)
Single	1 (0.4%)
Widowed	100 (43.9%)
Education level	
Illiterate	36 (15.8%)
Literate	14 (6.1%)
Elementary school	103 (45.2%)
Middle school	34 (14.9%)
High school	24 (10.5%)
University	17 (7.5%)
Living situation	
Alone	38 (16.7%)
With spouse	84 (36.8%)
With child	58 (25.4%)
With spouse and child	43 (18.9%)
With relative	3 (1.3%)
With caregiver	1 (0.4%)
With mother	1 (0.4%)
Primary caregiver	
Self	155 (68.0%)
Spouse	10 (4.4%)
Child	58 (25.4%)
Spouse and child	2 (0.9%)
Caregiver	3 (1.3%)
Smoking, active use	14 (6.1%)
Comorbidities	
Hypertension	148 (64.9%)
Diabetes mellitus	88 (38.6%)
Cardiovascular disease	90 (39.5%)
Cerebrovascular disease	17 (7.5%)
Chronic kidney disease	14 (6.1%)
Osteoporosis	21 (9.2%)
Dementia	46 (20.2%)
Depression	45 (19.7%)
Number of medications used	
0	12 (5.3%)
1-4	123 (53.9%)
5-10	85 (37.3%)
>10	8 (3.5%)
ADL point	4,8 (±1.9)
ADL score ADL dependency status	
Fully independent	140 (61.4%)
Mildly dependent	73 (32.0%)
Fully dependent	15 (6.6%)
IADL score*	5.54 (±3.1)
IADL Dependency Status	
Fully Independent	108 (47.4%)
Mildly Dependent	86 (37.7%)
Fully Dependent	34 (14.9%)
MMSE score	23.9 (±6.5)
Cognitive Impairment Status Normal	162 (71.1%)
Mild	26 (11.4%)
Severe	40 (17.5%)

Table 2. Distribution of skin findings observed in participants

Skin findings, n= 228	**n (%)**
Scar	100 (43.9%)
Xerosis	92 (40.4%)
Dermatophytosis	83 (36.4%)
T. Unguium	46 (20.2%)
T. Pedis	36 (15.8%)
T. Corporis	14 (6.1%)
T. İnguinalis	6 (2.6%)
T. Barbae	3 (1.3%)
T. Capitis	1 (0.4%)
Infection related skin lesions	
Bacterial skin lesions	32 (14.0%)
Viral skin lesions	11 (4.8%)
Parasitic skin lesions	4 (1.8%)
Eczema	78 (34.2%)
Urticaria	20 (8.8%)
Acneiform lesions	9 (3.9%)
Seborreic keratosis	86 (37.7%)
Psoriasis	3 (1.3%)
Decubitus ulcers	9 (3.9%)
Diyabetic foot ulcers	15 (6.6%)
Pruritus	72 (31.6%)
Other lesions*	21 (9.2%)

*ADL; Activities of Daily Living, IADL; Instrumental Activities of Daily Living, MMSE; Mini-Mental State Examination

Table 3. The relationship between skin findings and functional and cognitive status

	ADL				IADL				MMSE			
Skin findings n (%)	Fully independent (n=140)	Mildly dependent (n=73)	Fully dependent (n=15)	P	Fully Independent (n=108)	Mildly dependent (n=86)	Fully dependent (n=34)	P	Normal (n=162)	Mild (n=26)	Severe (n=40)	P
Xerosis	42 (30.0%)	41 (56.2%)	9 (60.0%)	**<0.001**	32 (29.6%)	35 (40.7%)	25 (73.5%)	**<0.001**	55 (34.0%)	12 (46.3%)	25 (62.5%)	**0.004**
Dermatophyrosis	47 (33.6%)	29 (39.7%)	7 (46.7%)	0.469	33 (30.6%)	36 (41.9%)	14 (41.2%)	0.219	54 (33.3%)	15 (57.7%)	14 (35.0%)	**0.005**
Infection related lesions	17 (12.1%)	14 (19.2%)	13 (86.7%)	**<0.001**	10 (9.3%)	18 (20.9%)	16 (47.1%)	**<0.001**	18 (11.1%)	8 (30.8%)	18 (45.0%)	**<0.001**
Eczema	37 (26.4%)	35 (47.9%)	6 (40.0%)	**0.006**	25 (23.1%)	34 (39.5%)	19 (55.9%)	**0.001**	44 (27.2%)	12 (46.2%)	22 (55.0%)	**0.002**
Urticaria	12 (8.6%)	8 (11.0%)	0 (0.0%)	0.390	7 (6.5%)	11 (12.8%)	2 (5.9%)	0.247	14 (8.6%)	3 (11.5%)	3 (7.5%)	0.847
Decubitus ulcers	0 (0.0%)	4 (5.5%)	5 (33.3%)	**<0.001**	0 (0.0%)	2 (2.3%)	7 (20.6%)	**<0.001**	0 (0.0%)	2 (7.7%)	7 (17.5%)	**<0.001**
Diabetic foot ulcers	4 (2.9%)	10 (13.7%)	1 (6.7%)	**0.010**	1 (0.9%)	13 (15.1%)	1 (2.9%)	**<0.001**	7 (4.3%)	6 (23.1%)	2 (5.0%)	**0.001**
Pruritus	34 (24.3%)	32 (43.8%)	6 (40.0%)	**<0.001**	24 (22.2%)	32 (37.2%)	16 (47.1%)	**0.009**	44 (27.2%)	13 (50.0%)	15 (37.5%)	**0.045**

*: Premalignant, malignant, undiagnosed lesions. The chi-square test was used for the comparison of categorical variables. The statistical significance was accepted when the p-value was less than 0.05.

Discussion

Our study is a cross-sectional study evaluating the relationship between dependency levels and skin lesions in patients aged 65 and older attending a geriatric outpatient clinic. A small portion of the participants were identified as "completely dependent" in GYA and/or EGYA, with most being determined to be "normal" cognitively. Skin lesions were detected in the vast majority of patients. Being "completely independent" in EGYA appears to be negatively associated with the presence of any skin lesion. Additionally, particularly xerosis, lesions associated with infection, eczema, diabetic foot ulcers, decubitus ulcers, and pruritus were significantly less observed in individuals who were not dependent on GYA, EGYA, and/or did not exhibit cognitive impairment in our study. Our study emphasizes the prevalence of skin lesions in elderly individuals, with certain lesions being more commonly observed in individuals with existing physical dependency and/or cognitive impairment. These findings are significant for assessments in this area.

Individuals who develop functional dependency encounter problems in managing their self-care. These individuals face difficulties in maintaining oral hygiene and bathing regularly [9, 17]. On the other hand, the challenges they face in ensuring hand hygiene in particular lead to serious infection risks [18]. Individuals who cannot maintain skin hygiene and moisture become susceptible to the development of new skin lesions. Additionally, for bed-bound individuals, staying in one position for an extended period and limited mobility contribute to the development and progression of pressure ulcers [19]. Chronic diseases can also contribute to reduced mobility and weight loss, thereby increasing susceptibility to pressure ulcer development [20]. In our study, it was observed that certain skin lesions occur less frequently in individuals identified as "completely independent" in EGYA and/or GYA. Moreover, more dependent individuals have limited access to healthcare services, and delays in seeking medical advice are likely [21]. The finding in our study that individuals rated as "completely independent" according to the EGYA scale, which also assesses individuals' external transfer situations, have fewer skin lesions supports this view. When evaluating functionally dependent individuals, their skin lesions should be examined in detail, and the risk of developing new lesions should be considered.

The increased frequency of skin lesions is known to be associated with certain morbidities that can cause or accompany functional dependency, as well as the medications used for their treatment [21, 22]. Malnutrition, a geriatric syndrome, is a significant problem in the elderly population that is functionally dependent. A diet low in protein and cachexia can lead to thinning of the skin's epidermis, a decrease in proliferative activity of epidermal cells, and reduced skin hydration. This, in turn, leads to pathological changes in the skin [23]. Incontinence is another syndrome commonly observed in functionally dependent individuals. Approximately 50% of individuals with incontinence experience dermatitis and pressure ulcers more frequently due to excessive moisture from urine and/or feces [8]. Dry skin and itching are among the most common skin findings, and these complaints are frequently seen in patients using antihypertensive drugs such as calcium channel blockers and hydrochlorothiazide [22], as well as in chronic kidney disease patients where skin pH is disrupted [23]. All these data may relate to our study's

finding of more frequent skin lesions in the dependent patient group. Additionally, physiological changes in the skin and changes in immunity due to aging increase skin problems in the elderly. This could explain why a significant portion of our study population (89.5%), whether dependent or not, exhibits some form of skin lesion. Both the effects of aging and the causes and consequences of functional dependency appear to be related to skin lesions.

Increased frequency of skin lesions has been shown in individuals with impaired cognitive function [10, 11].These lesions can result from various reasons such as pressure ulcers, itching, infections, and traumas. Individuals with cognitive impairment may struggle to take care of themselves in terms of hygiene and skincare. This difficulty in self-care can lead to deterioration in personal hygiene, resulting in skin soiling, infections, and lesions [5]. Atrophic changes such as thinning, dryness, and itching may be observed in the skin of patients with dementia. These changes can make the skin more sensitive and less resistant to trauma [6]. Moreover, difficulty in perceiving sensory signals such as pain and itching may occur in dementia patients. This can lead to unnoticed and untreated lesions on the skin [24]. Additionally, behavioral problems such as aggression, repetitive scratching, and traumatizing the skin are common in dementia patients and are associated with skin injuries and lesions. In our study, it was observed that individuals with "normal" cognitive function in the SMMT assessment had fewer skin lesions such as xerosis, lesions associated with infection, eczema, diabetic foot ulcers, decubitus ulcers, and pruritus. Given that skin lesions may be overshadowed by other problems in individuals with cognitive impairment, it is important to specifically inquire about skin lesions.

The socioeconomic status of individuals plays a significant role in the detection of skin lesions. Our study found that approximately half of the participants had only elementary education, and 15% were illiterate. In the study conducted by Çatak et al. on home healthcare patients, it was found that half of the participants were illiterate. Sönmez et al., in their study evaluating inappropriate medication use, found that 29% of participants were illiterate. In the study by Hazer et al., assessing health literacy among the elderly, it was found that 35.5% of participants had an education level of elementary school or lower [25, 26]. The observed differences between our study and these others may be attributed to the latter not being third-tier reference centres. In this group, the identity of the caregiver also significantly impacts patient management. Studies have shown that the patient's caregivers are usually their children and spouses, in that order [27, 28]. Similar to these findings, our study found that over half of the participants were married, and the primary caregivers for patients in need of care were most frequently their children, followed by their spouses. While the dependency of the elderly participants in our study on basic life activities was similar to that of other community-based studies (6.6%), the proportion of patients considered to have severe cognitive impairment, as indicated by scoring less than 17 on the MMSE, was found to be 17.5%. Although this rate is lower than that found in nursing homes, it is high compared to other community-based studies [29, 30].The selection of patients from a geriatric outpatient clinic as a reference might have played a role in this context.

Limitations

Our study possesses several strengths and limitations. It is a comprehensive study that assessed individuals' functional dependency and cognitive status using both the ADL (Activities of Daily Living) and IADL (Instrumental Activities of Daily Living) scales, as well as the MMSE (Mini-Mental State Examination). The scarcity of studies in the literature examining the relationship between patients' dependency levels and skin lesions renders our study valuable. It was conducted in the geriatric outpatient clinic of a tertiary education and research hospital. Given that the geriatric outpatient clinic is a subspecialty clinic, access is more challenging and phased, limiting the generalizability of our findings across the entire elderly population. Conducting the study across different provinces and centers would enhance its validity and reliability. In evaluating patients' skin lesions, preliminary diagnoses were made based solely on physical examination through inspection and patient history, without the use of advanced diagnostic tools such as dermoscopy for differential diagnosis or histopathological evaluation, representing a primary level of assessment. A more comprehensive approach and examination are required for the differential diagnosis and treatment of patients' skin lesions.

Conclusions

The association between functional dependency, cognitive impairment, and the occurrence of skin lesions in elderly individuals has been highlighted in this study. The findings suggest that skin conditions such as xerosis, infection-related lesions, eczema, diabetic foot ulcers, decubitus ulcers, and pruritus are more common among individuals living with functional limitations and cognitive impairment. Individuals who exhibit normal cognitive function or maintain independence in daily and instrumental activities are less likely to develop these lesions on the other hand. Regular skin evaluations are essential, especially for elderly individuals with reduced functionality or cognitive impairment, to prevent potential complications according to these results. Future research that involves diverse populations and advanced diagnostic methods is recommended to explore these associations further and inform preventive strategies. The integration of skin examination into geriatric care can lead to an improvement in quality of life and overall health outcomes for aging populations.

Conflict of interest: None

Author Contributions		Author Initials
HGT	Study Conception and Design	HGT, NKS, MIH, BD, OS
NKS	Acquisition of Data	HGT, BD, MIH, OS
MIH	Analysis and Interpretation of Data	HGT, NKS, MIH, BD, OS
BD	Drafting of Manuscript	HGT, NKS, MIH, OS
OS	Critical Revision	NKS, MIH, BD, OS

Financial support: None
Acknowledgments: None
Prior publication: No prior publication has occured

References

1. Elderly with Statistics, Turkish Statistical Institute. Avaliable at: https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Yaslilar-2023-53710

2. Ozkaya AG. Aksoy G, Skin Diseases in the Elderly: A Practical Approach (in Turkish). 2022;(107):15.
3. Kalayci BN, Yakaryilmaz FD. Evaluation of dermatological disease and malnutrition status in elderly at nursing home: a cross-sectional study.Turk Clin J Derma, 2022; 32(1): 16-21.
4. F. Savaş S. Comprhensive geriatric assesment. EJM 2010;49(3):19-30.
5. Zhang H, Zhang D, Tang K, Sun Q. The relationship between Alzheimer's disease and skin disease: a review. Clin Cosmet Investig Dermatol. 2021;14:1551-60. https://doi.org/10.2147/CCID.S322530
6. Pilkington SM, Bulfone-Paus S, Griffiths CE, Watson RE. Inflammaging and the Skin. J Invest Dermatol. 2021;141(4S):1087-95. https://doi.org/10.1016/j.jid.2020.11.006
7. Kligman A, Psychological aspects of skin disorders in the elderly. Cutis. 1989;43(5):498-501.
8. Borchert K, Bliss DZ, Savik K, Radosevich DM. The incontinence-associated dermatitis and its severity instrument: development and validation. J Wound Ostomy Continence Nurs. 2010;37(5):527-35. https://doi.org/10.1097/WON.0b013e3181edac3e
9. Gill TM, Guo Z, Allore HG. The epidemiology of bathing disability in older persons. J Am Geriatr Soc. 2006;54(10):1524-30. https://doi.org/10.1111/j.1532-5415.2006.00890.x
10. Clos AL, Kayed R, Lasagna-Reeves CA, Association of skin with the pathogenesis and treatment of neurodegenerative amyloidosis. Front Neurol. 2012;3:5 https://doi.org/10.3389/fneur.2012.00005
11. Ikoma A, Ebata T, Fukuda R, et al. Prevalence of pruritus in the elderly with dementia: a multicenter survey of Japanese patients. Acta Derm Venereol. 2020;100(14):adv00210. https://doi.org/10.2340/00015555-3572
12. Katz S, Downs TD, Cash HR, Grotz RC. Progress in development of the index of ADL. Gerontologist.1970;10(1):20-30. https://doi.org/10.1093/geront/10.1_part_1.20
13. Lawton MP, Brody EM, Assessment of older people: self-maintaining and instrumental activities of daily living.Gerontologist 1969 ;9(3):179-86.
14. Isik EI, Yilmaz S, Uysal I, Basar S. Adaptation of the Lawton instrumental activities of daily living scale to Turkish: validity and reliability study. Ann Geriatr Med Res.2020;24(1):35-40. https://doi.org/10.4235/agmr.19.0051
15. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975;12(3):189-98
16. Gungen C. Validity and reliability of Standardized Mini Mental State Examination in the diagnosis of mild dementia in Turkish society. Turk J Psych. (in Turkish). 2002;13(4):273-81.
17. Ruiz-Medina P, Bravo M, Gil-Montoya JA, Montero J. Discrimination of functional capacity for oral hygiene in elderly Spanish people by the Barthel General Index.Community Dent Oral Epidemiol. 2005t;33(5):363-9. https://doi.org/10.1111/j.1600-0528.2005.00222.x
18. Behunin T, Mantey J, Cassone M, Mody L. Functional dependence as a contributing factor for patient hand contamination by multidrug-resistant organisms in acute care.Infect Control Hosp Epidemiol 2024;10:1-6. https://doi.org/10.1017/ice.2024.70
19. Lindgren M, Unosson M, Fredrikson M, Ek AC. Immobility–a major risk factor for development of pressure ulcers among adult hospitalized patients: a prospective study.Scand J Caring Sci. 2004;18(1):57-64. https://doi.org/10.1046/j.0283-9318.2003.00250.x
20. Jaul E, Barron J, Rosenzweig JP, Menczel J. An overview of co-morbidities and the development of pressure ulcers among older adults. BMC Geriatr. 2018 Dec 11;18(1):305. https://doi.org/10.1186/s12877-018-0997-7
21. Duim E, Felipe H, Yeda A, Rita C, Maria L. Prevalência e características das feridas em pessoas idosas residentes na comunidade. Rev. esc. enferm. 2015; 49(Esp):50-56. https://doi.org/10.1590/S0080-623420150000700008
22. Kottner J, Lichterfeld A, Blume-Peytavi U. Maintaining skin integrity in the aged: a systematic review. Br J Dermatol. 2013 Sep;169(3):528-42. https://doi.org/10.1111/bjd.12469
23. Sugiyama A, Fujita Y, Kobayashi T, et al. Effect of protein malnutrition on the skin epidermis of hairless mice. J Vet Med Sci. 2011;73(6):831-5. https://doi.org/10.1292/jvms.10-0399
24. Luo Y, He P, Guo C, Chen G, Li N, Zheng X. Association between sensory impairment and dementia in older adults: evidence from China.J Am Geriatr Soc. 2018;66(3):480-6. https://doi.org/10.1111/jgs.15202
25. Catak B, KILINC A, BADILLIOGLU O, Sütlü S, Sofuoglu AE, Aslan D. Profile of elderly patients receiving home health care services in Burdur and health services provided at home. TJPH. (in Turkish) 2012;(10)1:2 - 13
26. Hazer O, Ateşoğlu L. The effect of health literacy on successful aging in the elderly: An example from Ankara. Interdisciplinary Approach to Geriatrics and Gerontology: Turkey Clinics (in Turkish); 2019; 48-56
27. T. MG., "Yaşlı Hastalarına Bakım Veren Kadınların Deneyimleri Işığında "Evde Bakım Hizmetinin" Değerlendirilmesi," no. 26, pp. 157-86, 2017.
28. Özgül E, Akpınar Söylemez B. The Effect of Gender of Caregivers of Dementia Individuals on Caregiver Self-Efficacy. GUJH. (in Turkish) 2022;11(3):1107-13. https://doi.org/10.37989/gumussagbil.943585
29. Şahin S, Boyacıoğlu H, Taşar PT, Kozan E, Sarıkaya OF, Akçiçek F. Functional dependency rates in the population over 65 years of age living in Bornova district. EMJ (in Turkish). 2016; 55(2): 65-70.
30. Saltan A, Mert Boğa S, Kalındemirtaş Küçük M. The Investigation of Physical Health/Function and Sleep in Older Adults HC., 2018;2(9):31-37