ORIGINAL ARTICLE

Eastern Journal of Medicine

East J Med 30(1): 37-43, 2025
DOI: 10.5505/ejm.2025.34119

Retrospective Analysis of Prisoner Patients Presenting with Dermatological Complaints to a Tertiary Dermatology Referral Center"

Nazlı Caf[1*], Defne Özkoca[2], Büşra Çarpan[1], Dilayda Kayapinar[1], Dilay Baştuğ[1], Zuhal Metin[3], Mustafa Tümtürk[4], Zafer Türkoğlu[1]

[1]*Başakşehir Çam and Sakura City Hospital, Department of Dermatology*
[2]*Koç University Hospital, Department of Dermatology*
[3]*Kırşehir Ahi Evran University, Department of Dermatology*
[4]*Tekirdağ Malkara State Hospital, Department of Dermatology*

ABSTRACT

Providing dermatologic care to prisoners can be challenging due to their poor compliance to treatment and difficulty for the follow-up visits. The aim of this study is to evaluate the dermatological diseases among male prisoners in Turkey and to assess the relationship of the age, education status, addiction status and body mass indexes of the prisoners to the primary dermatologic complaint and the definitive diagnosis.

This is a retrospective study performed in the dermatology outpatient clinic of Başakşehir Çam and Sakura City Hospital; male prisoner patients who have been brought to the clinic have been included. Each patient was evaluated by a dermatologist, history was taken precisely including the substance habits and educational status.

A total of 175 male patients were included in the study. A statistically significant relationship was found between the use of alcohol and acute skin findings (p=0.002). The patients with the highest body mass indexes were diagnosed with dermatitis, lowest body mass indexes were diagnosed with benign and malignant tumoral lesions (p=0.030).

This study has revealed that there is a positive association between alcohol abuse and frequency of viral infections; and a negative association between body mass index and skin cancer risk.

Key words: Dermatitis, genital ulcer, prisoner, pruritus

Introduction

Providing dermatologic care to prisoners can be more challenging than that of regular patients due to their poor compliance to treatment and difficulty in returning for the follow-up visits. Certain transmissible diseases such as tinea pedis, scabies and condyloma accuminata can be seen more in the prison setting compared to the general population. (1) Several studies from many different countries have analyzed the dermatological diseases seen in prisoners previously. Some of these studies were based on teleconsultations and some of these studies were based on face-to-face evaluation. (2-8) Skin infections and infestations were commonly seen in prisoners due to the decreased hygiene. (6) It has also been reported that skin diseases were seen more common in the prisoners compared to the general population; and male prisoners had more dermatologic complaints compared to the female prisoners (4). A previous study on male prisoners from Italy reported that dermatitis, acne, mycosis and scabies were the most commonly seen dermatological diseases. Furthermore, dermatitis had a significant association with increased age and substance abuse. (2)

The aim of this study is to evaluate the dermatological diseases among male prisoners in Turkey and to assess the relationship of the age, education status, addiction status and body mass indexes of the prisoners to the primary dermatologic complaint and the definitive diagnosis.

[*]**Corresponding Author:** Nazlı Caf, Başakşehir Çam and Sakura City Hospital, İstanbul, Türkiye
E-mail: naslicaf@hotmail.com, Phone number: +90 536 639 18 13
ORCID ID: Nazlı Caf: 0000-0001-9364-9236, **Defne Özkoca:** 0000-0002-4211-2276, **Büşra Çarpan:** 0009-0000-9419-6902, **Dilayda Kayapinar:** 0009-0003-4101-4492, **Dilay Baştuğ:** 0009-0002-0246-2463, **Zuhal Metin:** 0000-0001-9392-0620, **Mustafa Tümtürk:** 0000-0002-6616-9920, **Zafer Türkoğlu:** 0000-0002-3392-3560
Received: 07.08.2024, **Accepted:** 29.11.2024

Materials and Methods

This is a retrospective study performed in the dermatology outpatient clinic of Başakşehir Çam and Sakura City Hospital. All of the male inmate patients who have been brought to the outpatient clinic with dermatological complaints were included in this study. Female patients were excluded.

Each patient was evaluated by a dermatologist, history was taken precisely including the substance habits and educational status. The height and weight of the patients were measured before the physical examination by the nurses and the body mass indexes were calculated by the phyisian with the metric units (BMI = [Weight (kg)]/[Height (m)]^2. (9) The age; educational status; height, weight and body mass index; substance addiction habits including smoking, alcohol and illicit drugs; primary dermatological complaint; definitive dermatologic diagnosis; requirement of biopsy for diagnosis; and the treatment modalities including topical, systemic or surgical of each patient were noted to the patient files. The primary dermatological complaints of the patients were categorized into 4 groups: Chronic pathologies, genital ulcers, acute skin findings and cosmetic complaints. Chronic pathologies included tumoral lesions, nevi and the follow-up of chronic skin diseases eg. psoriasis, bullous pemphigoid and pemphigus vulgaris. Acute skin findings included newly formed papules, plaques, excoriations, dermatitis, urticaria, drug eruptions. Cosmetic complaints included scars, hypopigmentation, hyperpigmentation, hair loss, acne, folliculitis and nail changes

Ethics: The approval from Başakşehir Çam and Sakura City Hospital ethics committee was taken before the initiation of the study (2023.05.201).

The study was conducted according to the principles of the Helsinki Declaration.

Statistical Analysis: The statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) 26.0 software programme. Numbers and percentages are provided for categorical variables. It was concluded that the continuous variables in the study show a normal distribution and are suitable for parametric analysis, as their skewness and kurtosis values fall within the relevant reference range. ANOVA test was used to evaluate the relationship between the body mass indices and the definitive diagnosis of the patients. Pearson chi-square test was performed to evaluate the relationship of the other variables.

Results

A total of 175 male patients were included in this study. The mean age of the patients was 34.25 years. The mean height was 175.08 cm and weight was 79.06 kg; the mean body mass index was 25.80. The demographics of the patients are summarized in Table 1. The 34% of the patients have graduated from the elementary school, 29% from middle school, 23% from high school and 9% from college. Five percent of the patients were illiterate. Seventy-seven percent of the patients were smokers and they have smoked 16.2±9.4 packs per year on average. Sixty percent of the patients were using alcohol and 34.9% of the patients have previously used illicit drugs: 23% have used marijuana, 3% have used cocaine, 7% was have used and 2% have used amphetamine.

Of all the patients 53% had acute skin findings, 25% had cosmetic complaints, 15% had genital ulcers and 7% had chronic pathologies. The anatomic region of the main complaint was also analyzed: 14.3% of the patient had a complaint on their face, 8.0% on their hands, 4.6% on anterior abdomen, 5.7% on their upper extremities (hands excluded), 0.6% on their fingernails, 4.6% on their posterior abdomen, 9.1% on their lower extremities (feet excluded), 3.4% on their feet, 2.3% on their toe-nails, 18.9% in the anogenital region, 23.4% had widely distributed lesions, 4.6% on their scalp and 0.6% both on their hands and feet. Overall, the most common lesion localization was widespread distribution followed by the anogenital lesions.

The definitive diagnoses of the patients are summarized in Table 2. The most common diagnoses were viral infections followed by parasitic infestations and acneiform eruptions. The least common diagnosis was bacterial infections.

As for the comorbid medical diseases, 81.1% of the patients had no comorbid disease; 6.3% had diabetes mellitus, 5.1% hypertension, 4% asthma, 1.7% chronic obstructive pulmonary disease, 0.6% malignancy, 0.6% HIV and 0.6% Behçet Disease.

During the work-up of the patients, biopsy was performed in 21.7% in the patients. Only 1.7% of the patients were hospitalized for treatment, 98.3% were treated externally. Forty-eight percent of the patients received topical treatment, 36.6%

Table 1: Demographic Data of the Patients

	n	Mean	SD	Min	Max
Age	175	34.25	10.12	18	61
Height (cm)	175	175.08	6.95	160	196
Weight (kg)	175	79.06	11.07	59	130
BMI	175	2.80	3.37	20.05	39.06

n; frequency, SD; standard deviation, Min; lowest score received, Max; highest score

Table 2: The Definitive Diagnoses of the Patients

Diagnosis	n	%
Viral Infections	31	17.7
Bacterial Infections	3	1.7
Fungal Infections	17	9.7
Parasitic Infestations	26	14.9
Acneiform Eruptions	25	14.3
Benign and Malignant Tumors	9	5.1
Dermatitis	18	10.3
Psoriasiform Dermatoses	17	9.7
Drug Eruptions	14	8.0
Others	15	8.6

n; frequency, %; percent

oral or intravenous treatment and 15.4% surgical treatment.

Pearson chi-square test was performed to analyze the relationship between the age of the patients and their primary complaints. A statistically significant relationship was not found between the age of the patient and primary complaint. (p=0.898) Again Pearson chi-square test was performed to evaluate the relationship between the age of the patients and their definitive diagnoses. No statistical relationship was found. (p=0.674)

Pearson chi-square test was performed to analyze the relationship between the primary complaint of the patients and substance use statuses. A statistically significant relationship was found between the use of alcohol and acute skin findings (p=0.002); 56% of the patients with alcohol abuse complained of an acute skin finding. A statistically significant relationship was not found between the primary complaint and smoking or illicit drug use.

Table 3 summarizes the relationships between substance abuse and primary complaints. Pearson chi-square test was used to assess the relationship between the smoking status and definitive diagnoses; a statistical relationship was not found. (p=0.889). Again, the relationship between the drug abuse status and definitive diagnoses was assessed with Pearson chi-square test revealing that there is no statistical relationship (p=0.328). When the alcohol use status and the definitive diagnoses of the patients were analyzed with the Pearson chi-square test, a statistically significant relationship was found between alcohol abuse and viral infections; furthermore, parasitic infections were found significantly more in patients who did not use alcohol (p=0.046). Table 4 summarizes the relationship between the alcohol abuse and definitive diagnoses.

Pearson chi-square test was performed to assess the relationship between the education status of the patients and their primary complaints. No

Table 3: The Relationship Between Substance Abuse and Primary Complaint

		Primary Complaint			
		Genital ulcer	Acute skin findings	Cosmetic complaints	Chronic pathologies
		f (%)	f (%)	f (%)	f (%)
Smoking	yes	22 (16.3)	72 (53.3)	30 (22.2)	11 (8.1)
	no	5 (12.5)	20 (50.0)	13 (32.5)	2 (5.0)
	p			0.554	
Illicit Drugs	yes	9 (14.8)	32 (52.5)	12 (19.7)	8 (13.1)
	no	18 (15.8)	60 (52.6)	31(27.2)	5 (4.4)
	p			0.170	
Alcohol	yes	19 (18.1)	59 (56.2)	16 (15.2)	11 (10.5)
	no	8 (11.4)	33 (47.1)	27 (38.6)	2 (2.9)
	p			0.002*	

f; frequency, %; percent, p; significance value. Pearson Chi-squared test

Table 4: The Relationships between Alcohol Abuse and Definitive Diagnosis

	Alcohol		
Diagnosis	yes f (%)	no f (%)	p
Viral infections	24 (22.9)	7 (10.0)	.046*
Bacterial infections	2 (1.9)	1 (1.4)	
Fungal infections	12 (11.4)	5 (7.1)	
Parasitic infestations	15 (14.3)	11 (15.7)	
Acneiform eruptions	8 (7.6)	17 (24.3)	
Benign and malignant tumors	7 (6.7)	2 (2.9)	
dermatitis	8 (7.6)	10 (14.3)	
Psoriasiform Dermatoses	12 (11.4)	5 (7.1)	
Drug eruptions	9 (8.6)	5 (7.1)	
Other	8 (7.6)	7 (10.0)	

f; frequency, %; percent, p; significance value Pearson Chi-squared test

statistical relationship was found. (p=0.916) Again, no statistically significant relationship was found between the education status of the patients and their definitive diagnoses with the Pearson chi-square test. (p=0.925) Furthermore, no relationship was found between the comorbid diseases of the patients and their definitive diagnoses. (p=0.066)

The ANOVA test was used to assess the relationship between the definitive diagnoses of the patients and body-mass indices (BMI). A statistically significant relationship was found (p=0.030): the patients with the highest body mass indices were diagnosed with dermatitis; lowest body mass indices were diagnosed with benign and malignant tumoral lesions. Table 5 summarizes the relationship between the definitive diagnoses of the patients and their BMI scores.

Discussion

Since contagious infections and infestations within the prison can infect each other as well as the staff working in the prison, it is important to identify them correctly and take rapid action for treatment/protection. In addition, since this group of people may be neglected or delayed in diagnosis, it has become necessary to report its connection with certain personal characteristics in order to provide accurate analysis and raise awareness among physicians caring for this population.

Table 5: The Relationship Between BMI and Definitve Diagnoses

Diagnoses	n	Mean ± SD	$F_{(9,165)}$	p
Viral infections	31	25.27 ± 1.81	2.127	.030*
Bacterial infections	3	25.02 ± 1.38		
Fungal infections	17	26.93 ± 2.92		
Parasitic infestations	26	26.68 ±3.77		
Acneiform eruptions	25	25.21 ± 2.85		
Benign and malignant tumors	9	24.01 ± 2.35		
Dermatitis	18	27.89 ± 4.93		
Psoriasiform Dermatoses	17	24.66 ± 2.58		
Drug eruption	14	26.06 ±5.38		
others	15	24.85 ± 1.82		

f; frequency, %; percent, F; ANOVA test statistics value, p; ANOVA significance value

The Diagnoses: We report that the most common dermatological diagnosis among the prisoners were viral infections. Parasitic infections, including scabies, and acne were also common among our patient population. Several previous studies have investigated the dermatological diseases among prisoners. (2-6) A similar study to ours was performed in Italy, Mannocci et al. investigated the dermatological diseases among male prisoners. They report that the most common diseases among male prisoners were dermatitis, acne, mycotic infections and scabies. (2) In contrast to Mannocci et al, dermatitis and fungal infections, although still common, were less common in our patient population than that of Mannocci et al. (2) A study performed among the male and female prisoners in Taiwan has shown that the most common dermatological diagnoses among prisoners were dermatitis, bacterial infections and pruritus.[4] Again, dermatitis, although still common in our patient population, was less prevalent compared to the Taiwan population. Interestingly, the least common diagnosis in our patient population: bacterial infections, was common in the Taiwanian population. The prisoner population in Texas also differed from ours in terms of disease prevalence's. Inflammatory conditions (psoriasis, acne and dermatitis) were more common than the infectious diseases. (7) Acne and mycosis were the most frequent diagnoses in the French population. (10) A study supporting our results was performed in Nigeria showing that the infectious dermatological diseases are common among the prisoners. Overcrowding in the prisons, poor personal hygiene, lack of soap and humid environment not only predispose prisoners to acquire infectious diseases but also increase the risk of spread. (6) Given the fact that Turkey, similar to Nigeria, is a developing country, and the conditions in the prisons may be worse; the increased prevalence of infectious disorders among the prisoners is an expected result.

Disease Relationship to Age: Previously Mannoci et al. reported that inmates older than 35 years had a greater tendency towards acquiring a dermatological disease. (2) In this study we have only evaluated patients who have applied to the outpatient clinic and we have not found an association of the age of the patient to the primary complaint or definitive diagnosis. We cannot comment on the effect of age on acquiring a dermatological disease. Furthermore, there were no previous reports on the relationship of age and dermatological diagnoses among prisoners.

Disease Relationship between Educational Status: We did not find a statistical relationship between the educational status of the patient and the primary complaint or the definitive diagnosis. Similar to us, Mannoci et al. also report that there is no relationship of educational level to the dermatological diagnoses among inmates. (2)

Disease Relationship with Substance Abuse: There is statistically significant relationship between the use of alcohol and acute skin findings (p=0.002). Furthermore, a statistically significant relationship was present between alcohol abuse and viral infections. There were no previous studies regarding the relationship between alcohol and tobacco use, and dermatological conditions among prisoners. A previous study supporting our finding of an increased risk of viral infection with alcohol abuse showed that the herpes simplex virus-2 infection had an increased prevalence among adolescent women with alcohol abuse. (11) The use of alcohol may potentially contribute to

immunosuppression, leading to susceptibility to acute dermatoses. Further investigation of this condition is necessary with a broader patient population. There were no previous studies regarding the relationship between alcohol abuse and molluscum virus infection, human-papilloma virus infection and varicella zoster infection.

Furthermore, parasitic infections were found significantly more in patients who did not use alcohol. (p=0.046) We could not find any supporting literature fort his result. Indeed, there was a report of crusted scabies in a diabetic alcoholic, which contradicts with our finding. (12) At this point, it may be possible to conclude that scabies is unrelated to immune status or other parameters due to its effect only on the upper layer of the skin, and its association is solely with crowded conditions. The study also reaffirms the fact that scabies infestations in prisons pose a significant public health problem, emphasizing the urgent need for preventive measures.

We failed to find a relationship between the psychotropic drugs to any dermatological disease. Mannoci et al. report that acne, psoriasis and dermatitis have a significant relationship with psychotropic drug use. (2) Likewise, Roodsari et al. reported an increased prevalence of acne among iv drug abusers. (13) The reason for this may be attributed to the differences in the drugs used. Controversially, in our study, intravenous drug use was less frequent compared to other substances. This may be due to the relatively low number of samples in our study.

Disease Relationship with BMI: In our study, the patients with the highest body mass indices were diagnosed with dermatitis; lowest body mass indices were diagnosed with benign and malignant tumoral lesions. It is well known that higher body mass indices lead to a higher risk of psoriasis. (14) Our findings are consistent with both widely accepted medical knowledge and current literature. Implementing different diets for specific populations under the guidance of a dietitian in prisons may potentially prevent this situation and reduce economic and social burdens.

Previously atopic dermatitis have been associate with higher body mass indeces in children as well.[15] Hidraadenitis suppurativa risk is also increased with higher body mass indeces.[16] Supporting our finding, Lu et al. Reported that there was a strong negative association between body mass index and basal cell carcinoma. (17) Zhou et al. also reported an inverse relationship between body mass index and non-melanoma skin cancer risk. (18) Contradicting to these, Tang et al. Reported that higher body mass indeces were associated with a lower non-melanoma skin cancer risk. (19) Our results point out to a negative association between the body mass index and skin cancer risk; further studies are required to elucidate this association.

As a conclusion, it may be similar in the general population as well, but individuals who are frail in prison may need to be screened more frequently for skin malignancies because in our study, the frequency of skin malignancies was found to be higher in frail prisoners. In our study, since acute dermatoses and viral infections were more frequently detected in individuals with a history of alcohol use, those with a history of alcohol use in their medical background may need to be screened periodically for viral infections. Screenings for parasitic infestations such as scabies should be intensified, and emphasis should be placed on providing education on this matter to both inmates and guards. As the frequency of dermatitis and psoriasis increases in overweight prisoners, adaptation to healthy nutrition and exercise programs should be encouraged.

Acknowledgment: None.

Conflict of interest: The authors declare that they have no conflict of interest.

Funding: This study did not receive any grant.

Data availability statement: The data that support the findings of this study are available upon request. The data are not publicly available due to privacy and ethical restrictions.

References

1. Brauner GJ, Goodheart HP. Dermatologic care behind bars. J Am Acad Dermatol. 1988 May;18(5 Pt 1):1066-73.
2. Mannocci A, Di Thiene D, Semyonov L, Boccia A, La Torre G. A cross-sectional study on dermatological diseases among male prisoners in southern Lazio, Italy. Int J Dermatol. 2014 May;53(5):586-92.
3. Stephan B, Girbig G, Scherer M, Blozik E, Augustin M. Dermatologische Videosprechstunden für deutsche Justizvollzugsanstalten: Erfahrungen aus teledermatologischen Konsilen 2020 bis 2022 [Dermatological video consultations for German prisons : Experiences from teledermatological consultations 2020 to 2022]. Dermatologie (Heidelb). 2022 Nov;73(11):859-865.
4. Jiesisibieke ZL, Lin, J, Lin YC, Hisiao YY, Tung TH. Prevalence of skin diseases in

Taiwan prisons: a population-based study. BMC Public Health, 2023; 23, 460.

5. Kocatürk E, Kocatürk A, Kavala M. Prevalence of skin diseases in female prisoners in Turkey: analysis of impact of prison conditions and psychological stress. Acta Dermatovenerol Croat. 2014;22(1):26-31.
6. Oninla OA, Onayemi O. Skin infections and infestations in prison inmates. International Journal of Dermatology, 2012.51:178-181.
7. Coury C, Kelly B. Prison dermatology: experience in the Texas Department of Criminal Justice dermatology clinic. J Correct Health Care. 2012 Oct;18(4):302-8.
8. Phillips CM, Murphy R, Burke WA, et al. Dermatology teleconsultations to Central Prison: experience at East Carolina University. Telemed J. 1996 Summer;2(2):139-43.
9. Zierle-Ghosh A, Jan A. Physiology, Body Mass Index. 2022 Sep 11. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023.
10. Grange F, Levin B, Pellenq E, Haegy JM, Guillaume JC. Consultation dermatologique en milieu carcéral: analyse de trois années d'activité dans une maison d'arrêt française [Dermatological consultation behind bars: an analysis on a three-year period in a French prison]. Ann Dermatol Venereol. 2001 Apr;128(4):513-6.
11. Cook RL, Pollock NK, Rao AK, Clark DB. Increased prevalence of herpes simplex virus type 2 among adolescent women with alcohol use disorders. J Adolesc Health. 2002 Mar;30(3):169-74.
12. Klein LJ, Cole G. Crusted scabies in a diabetic alcoholic. Int J Dermatol. 1987 Sep;26(7):467-8.
13. Roodsari R, Malekzad F, Ardakani M E. Skin diseases in male prisoners. Indian J Dermatol Venereol Leprol 2007;73:55-56
14. Budu-Aggrey A, Brumpton B, Tyrrell J, et al. Evidence of a causal relationship between body mass index and psoriasis: A mendelian randomization study. PLoS Med. 2019 Jan 31;16(1):e1002739.
15. Nicholas MN, Keown-Stoneman CDG, Maguire JL, Drucker AM. Association Between Atopic Dermatitis and Height, Body Mass Index, and Weight in Children. JAMA Dermatol. 2022 Jan 1;158(1):26-32.
16. Wright S, Strunk A, Garg A. Trends in body mass index before and after diagnosis of hidradenitis suppurativa. Br J Dermatol. 2021 Jul;185(1):74-79.
17. Lu L, Wan B, Zeng H, Guo J, Li M, Sun M. Body mass index and the risk of basal cell carcinoma: evidence from Mendelian randomization analysis. PeerJ. 2023 Jan 24;11:e14781.
18. Zhou D, Wu J, Luo G. Body mass index and risk of non-melanoma skin cancer: cumulative evidence from prospective studies. Sci Rep. 2016 Nov 29;6:37691.
19. Tang JY, Henderson MT, Hernandez-Boussard T, et al. Lower skin cancer risk in women with higher body mass index: the women's health initiative observational study. Cancer Epidemiol Biomarkers Prev. 2013 Dec;22(12):2412-5.