

## Prevalence of Skin Diseases in Female Prisoners in Turkey: Analysis of Impact of Prison Conditions and Psychological Stress

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Received: July 15, 2013

Accepted: September 10, 2013

**SUMMARY** Prisons have been studied as communal places where risk of contagious diseases and dermatological diseases associated with stress are more frequent. We aimed to investigate the prevalence of skin diseases in female prisoners with special focus on psychological stress. We held a day-time dermatology polyclinic for 6-weeks. The patients were given Beck Depression Inventory (BDI) and a questionnaire on the psychological impact of skin disease. A total of 383 female prisoners were examined; 41 dermatological diseases were diagnosed. Acne was the most prevalent condition (34%), followed by hair loss (19%), dry skin (16%), and eczema (12%). Thirty-six percent of the prisoners felt embarrassed, 34% felt anxious, and 45% felt sad about their skin disease. Forty seven of the responders were found to be in severe depression according to BDI responses. We could not find any association between BDI results and any kind of skin disease diagnosed in inmates. Our study demonstrates that prisoners have benign and common skin conditions similar to those in the general population.

**KEY WORDS:** skin diseases, prisoners, female prisoners, quality of life, depression

### INTRODUCTION

Prisons have been studied as communal places where risk of contagious diseases such as scabies, pediculosis, dermatophytosis, and viral infections is higher, and where dermatological diseases which are thought to be associated with stress are more frequent (1,2). Dermatological diseases have been reported as the fifth most common disease in pris-

ons, with a percentage of 7.7% in a Belgian study (3). Even though prison conditions could exacerbate skin conditions and make treatment more challenging, a search in PubMed using the search terms "prisoners and skin diseases", "dermatology behind bars", and "prison and skin diseases" retrieved only a few studies concerning prevalence of skin diseases in prisons

(4-9). Of these, four investigated skin diseases in male prisoners while only a single study examined female prisoners (8).

It has been shown that mental disorders are found significantly more frequently in prisoners in comparison to normal population (10,11). Women prisoners have higher rates of depressive disorders, anxiety disorders, drug and alcohol-related disorders, and personality disorder (12). Since the role of psychological stress in skin diseases has been established (13), we aimed to investigate the prevalence of skin diseases with special focus on psychological stress in female prisoners, and to determine factors that could lead to occurrence of specific skin diseases.

### MATERIALS AND METHODS

This prospective study was performed over a period of 6 weeks from November 2008 to January 2009 in a women prison in Istanbul, Turkey. The prison consisted of a total of 908 inmates. There was an inpatient hospital facility with 24-hour service which offers the services of a general practitioner (GP), a nurse, and two health officers. There is no medical check-up before entering the prison. In routine practice, skin diseases are managed by the GP. When dermatology consultation is needed, the prisoners are referred to hospitals with a dermatological clinic. The waiting period to see a dermatologist is between 15-30 days, because outpatient visits requires prison staff to arrange secure transfer to the hospital.

We held a day-time dermatology polyclinic for 6 weeks in a special examination room where other medical staff was present. The prisoners were informed that dermatology consultation is available for the duration of the study, and all applications or requests for dermatology examination were accepted. The prisoners were asked to fill in a form that included the following data: age, nationality, date of entry, type of offences, education level, family and occupational situation before incarceration, drug and alcohol abuse, systemic diseases, systemic medicines, presence of the human immunodeficiency virus (HIV) and the hepatitis C virus (HCV), frequency of visitors, presence of a existing skin disease, the effect of incarceration on the skin disease, frequency of showers, and number of prisoners in the cell.

Apart from this form, each patient was given Beck Depression Inventory (BDI) and a questionnaire created by Bayle *et al.* for a previous study (7), which included questions on how the patient feels when the other prisoners see her, how they behave towards her, as well as on the impact of skin disease on the prisoner's mental and physical health and quality of life.

### RESULTS

A total of 383 female prisoners with 607 diagnoses were examined; 41 diseases were diagnosed. Mean age was 32.7±9, 9 years (range: 15-66). Mean time of incarceration was 17.0±20.3 months (range:1-240). 309 (81%) of them were Turkish and 74 were of other nationalities. The demographic characteristics of the patients are presented in Table 1. 191 (86%) of the patients reported that they lived in worse conditions before incarceration. Offences against public health constituted the majority of the incarceration cases (37%). Other offences were offences against constitutional order and its functioning, offences related to data processing systems, offences against public morality, offences against life, offences against public safety, offences against public health, offences against property, and offences against physical integrity. Sixty-eight (20%) had a history of drug abuse and 8% of alcoholism. 3 of them were HIV-positive, and 3 were HCV-positive. 12 (4.6%) had diabetes, 23 (8.8%) had hypertension, 8 (3%) had asthma, 7 (2.7%) had thyroid disorders, and 3 (1.2%) had cancer. Twenty-three (8.8%) were using anti-hypertensive drugs, 5 (2%) anti-depressants, 3 (1.3%) anti-diabetics, and 5 (2.1%) were using thyroid drugs. Smoking was very

**Table 1.** Demographic characteristics of the patients

Characteristic	N	%
Age (15-66)	32.74±9,9	
Nationality		
Turkish	309	80.7
Not Turkish	74	19.3
Race		
White	340	88.8
Black	28	7.3
Hispanic	15	3.9
Duration of incarceration (Min:1- Max:240)	17.1±20.3	
Occupation		
Unemployed or retired	126	46.2
Employee	96	35.2
Employer	16	5.9
Management	6	2.2
Trade	29	10.6
Economic and social level before incarceration		
Better	32	14.3
Worse	191	85.7
Educational level		
No schooling	53	17.4
Primary school	85	28
Secondary school	122	40.1
High school or higher	44	14.5

common; only 32% of the patients were non-smokers (21.5% were smoking 1-10, 36.5% were smoking 11-20, and 11% were smoking >21 cigarettes a day). Visitors were reported to be frequent by 39%, occasional in 26.5%, and infrequent in 16.4% of the patients. 88 (23%) reported to have had skin diseases before incarceration, and 32.6% blamed incarceration for the onset or aggravation of skin disease. Causes of skin disease were reported to be stress, drugs, and prison conditions by 31%, 1.6% and 18.6% of the prisoners, respectively.

201 (77%) of the patients were sharing the cell with 21-30 prisoners, 11% with >31 prisoners, 8.5% with 5-10 prisoners, 1.5% with 11-20 prisoners, and 1.5% with 1-4 prisoners. 180 patients (68%) were having showers 4-7 times, 29% 2-3 times, and 2.6% were having showers >8 times a week. Only 17% reported that they could see the doctor whenever they needed. 37 (86%) were examined by a GP for the skin disease, while 7% were examined by a dermatologist. Offences against public health constituted the majority of the cases (37%). Other offences were offences against constitutional order and its functioning, offences related to data processing systems, offences

against public morality, offences against life, offences against public safety, offences against public health, offences against property, and offences against physical integrity.

Acne was the most prevalent condition (n=129) followed by hair loss (n=71), dry skin (n=61), eczema (n=47), and hyperpigmentation (n=43). Common skin diseases are shown in Table 2. Other skin diseases that were rarely diagnosed: nevi (n=5), scars (n=3), parapsoriasis (n=3), pityriasis rosea (n=2), actinic keratosis (n=2), erythema multiforme (n=2), hidradenitis suppurativa (n=2), keratosis pilaris (n=2), hyperhidrosis (n=1), epidermal nevus (n=1), heroin ulcers (n=1), decubitus ulcers (n=1), obstructive purpura (n=1), pediculosis (n=1), tuberous sclerosis (n=1), and neurofibromatosis type 1 (n=1). No malignant tumors were diagnosed. Only one patient was referred to a hospital dermatology clinic for biopsy to exclude mycosis fungoides.

The effect of nationality on diagnosis was analyzed: neurodermatitis and hirsutism were more prevalent in Turkish prisoners ( $P=0.038$  and  $P=0.029$ ), while seborrhea was more prevalent in other nationalities ( $P=0.039$ ). Syphilis and sexually-transmitted diseases (gonorrhea) were found in two prisoners from other countries. The influence of the duration of incarceration on skin diseases only showed a significant association with fungal diseases and psoriasis. Prevalence of fungal diseases was higher in patients whose duration of incarceration was <3 years ( $P=0.039$ ), and prevalence of psoriasis was higher in patients with a duration of incarceration >3 years ( $P=0.023$ ). The socioeconomic situation before incarceration was not associated with the skin diseases ( $P>0.05$ ). Acne was more prevalent in single patients ( $P<0.001$ ), and fungal infections were more prevalent in widowed ( $P=0.004$ ). The frequency of visitors, frequency of showers, and number of prisoners in the cell were not found to be associated with skin diseases ( $P>0.05$ ). There was no association between skin disease and the presence of drug abuse, alcoholism, systemic diseases, and systemic medication. Hair loss and fungal infections were more prevalent in smokers ( $P=0.021$  and  $P=0.029$ ). Type of offence did not have an impact on skin diseases ( $P>0.05$ ).

The answers from the questionnaires are presented in Table 3. 103 (36%) of the patients felt embarrassed, 34% felt anxious, and 45% felt sad about their skin disease. There was no statistically significant association between skin diseases and responses to the questionnaire ( $P>0.05$ ). A total of 93 patients completed the Beck Depression Inventory (BDI): it was available only in the Turkish language, so foreigners could

**Table 2.** Most common dermatological diagnoses

	No.	%
Acne	129	33.7
Hair loss	71	18.5
Dry skin	61	15.9
Eczema	47	12.3
Hyperpigmentation	43	11.2
Fungal infections	38	9.9
Neurodermatitis	26	6.8
Pruritus	20	5.2
Seborrheic dermatitis	19	5.0
Folliculitis	19	5.0
Hirsutism	19	5.0
Seborrhea	15	3.9
Skin infections	10	2.6
Urticaria	10	2.6
Plantar hyperkeratosis	9	2.3
Benign tumors	7	1.8
Alopecia areata	6	1.6
Intertrigo	6	1.6
Psoriasis	5	1.3
Stria	5	1.3
Warts	4	1.0
Vitiligo	4	1.0
STD	3	0.8
Syphilis	1	0.3
Callosity	1	0.3

**Table 3.** Responses to the questionnaire

	No.	%
What do you feel when the others see your skin disease?		
No response	151	52.6
Embarrassment	103	35.9
Everybody is aware of my skin disease	33	11.5
What do other prisoners say about your skin disease, how do they react?		
No response	50	17.5
They do not comment	179	62.8
They help me, they are kind	56	19.6
Do you often think about your skin disease?	64	22.5
Do you have the impression that your skin disease is spoiling your life?	22	7.7
Does your skin disease make you tired?	32	11.2
Does your skin disease make you anxious or worried?	96	33.7
Sad?	129	44.9
Nervous, irritable?	84	29.4
Aggressive?	42	14.7
Are you ashamed of it?	73	25.5
Is your skin disease painful?	45	15.8
Does your skin disease scratch/prick/itch?	115	40.4
Does your skin disease prevent you from sleeping?	40	14.0
Do you work?	38	13.2
If yes, does your skin disease interfere with your work?	8	2.8
Do you have to stop work because of your skin disease?	5	1.8
Do you play sports?	39	13.7
If yes, does your skin disease physically interfere with playing sports?	6	2.1
Did you have to stop playing sports because of your skin disease?	5	1.8

not fill it out, and some other patients refused to fill it out for personal reasons. 44 (47%) of the responders had severe depression according to BDI (Table 4). There was no statistically significant association between BDI results and skin diseases ( $P>0.05$ ). We could not show an association between duration of incarceration and BDI results ( $P>0.05$ ). We also found no association between the responses to the questionnaire and BDI results ( $P>0.05$ ).

## DISCUSSION

Skin diseases in prisoners have been investigated mainly among men (4-7,9). Brauner *et al.* evaluated 3750 male prisoners in New York between 1976 and 1983. The most common diagnoses were warts (18%), acne (14-19%), and eczema (11-13%). The high prevalence of warts was related to the sexual activity of the inmates. Acne was less commonly seen than in the general population visiting a private GP practice in the USA. Diseases with psychogenic component such as psoriasis and seborrheic dermatitis were not common, but alopecia areata had a high incidence (3-4%), appearing shortly after imprisonment. Nonspecific pruritus seemed to increase, most likely due to the

overheated surroundings and harsh soaps used for cleaning. The authors also noted that shared showers and wearing of nylon sneakers increase the spread of tinea pedis (4).

In a study conducted in a French prison over a period of 3 years, 180 male prisoners were evaluated. Acne (30%), fungal infections (13%), eczema (9%), and pruritus (8%) were the most common skin problems (5).

Roodsari *et al.* found tinea versicolor (11%), acne (5%), and dry skin (5%) as the most common skin conditions among 783 male prisoners in an Iranian prison (6). Another study from Iran reported that 45% of prisoners were infected by *Malassezia*, but with no difference between the pattern of tinea versicolor in prisoners and normal population (14).

**Table 4.** The results of Beck Depression Inventory

BDS Score	No.	%
0-9 points = Minimal depression	9	9.7
10-16 points = Mild Depression	12	12.9
17-29 points = Moderate Depression	28	30.1
30-63 points = Severe Depression	44	47.3

In a study which evaluated teleconsultations from a prison, the most common problems were eczema and acneiform eruptions (15).

Bayle *et al.* included 178 male prisoners with 234 diagnoses. The most common diagnoses were disorders of pilosebaceous follicle (acne 8.6%, epidermoid cysts 6%, folliculitis 3%), fungal diseases (14%), and benign skin tumors (11%) (7). The authors stated that the most frequent skin conditions were those which could be expected in a population of young men living in a closed community. Frequent appearance of pilosebaceous unit disorders was related to stress and tobacco use. Psoriasis, seborrheic dermatitis, self induced lesions (often associated with stress), and bacterial infections that are supposed to be frequent were surprisingly infrequent. They concluded that the reasons for dermatology consultations from prisons were similar to those in the general population.

The only study among female prisoners was conducted by Adamski *et al.* in a French prison (8). Among 579 consultations during 6 years, the most common diagnoses were warts (23-25%), acne (17-27.5%), fungal infections (5-10%), and pruritus (6.5-7%).

In a study from Nigeria, skin infections and infestations were found to be more common in prisoners, and infectious dermatoses were significantly affected by prison status, frequency of baths, changing of clothes, accommodation arrangement, frequency of soap usage, and toilet facilities (9).

In our study, we diagnosed 41 skin conditions; the most frequent problems were acne 34%, hair loss (19%), dry skin (16%), and eczema (12%). Previous studies reported similar conditions to be frequent problems; however, in those studies fungal infections were more common than hair loss. When we compared the frequency of skin problems in the general population in Turkey, the most common skin problems being reported were fungal infections (17%), eczema (17%), pilosebaceous unit disorders (12%), and bacterial infections (8%) (16), whereas fungal infections (23%), eczema (21%) and bacterial infections (10%) were found to be frequent in another study (17). In prison environment neither fungal infections nor bacterial infections were common; the skin problems we encountered were indeed issues of self maintenance and benign conditions. The high demand for dermatology consultations in our study could be explained by substantial use of health care by prisoners. Such overuse has been reported by Marshall *et al.*; in the UK, prisoners consulted their general practitioner three times more often than a demographically equivalent population (18). In our study, the prisoners might have seen the dermatology consultation as

an opportunity to get creams and vitamins to make them look better. It was interesting to find that 86% of the prisoners reported living in worse conditions before incarceration. This could explain why infections, infestations and stressful conditions were rarely seen in our population when compared to the general population. They bathed more frequently than before incarceration (68% were having showers 4-7 times a week), using hot water which they had poor access to. As they lacked moisturizers to use after baths, this could be the reason for dry skin.

Smoking was very common: 68% of our study population were smokers. It has been demonstrated that smoking is associated with late-onset acne, nodular cystic forms, and increased frequency of acne scars (7). Although the severity of acne was mild and moderate in our population, most of the prisoners reported to have late onset acne, which could be linked to both smoking and stress. Hair loss and fungal infections were found to be more prevalent in smokers, which we could not explain satisfactorily.

Approximately 80% of the prisoners were sharing cells and showers with 21-30 inmates; this could have lead to spread of tinea pedis and viral warts, but this was not the case: the number of prisoners in the cell was not found to have an impact on skin diseases.

The influence of duration of incarceration was found significant only regarding fungal diseases and psoriasis. The prevalence of psoriasis was found to be higher in prisoners with duration of incarceration above 3 years. This may be explained by prison conditions that cause stress, dry skin, and lack of sunlight. Fungal diseases were found to be associated with duration of incarceration shorter than 3 years, which we believe has no clinical impact.

To examine the impact of skin diseases on quality of life, we used a questionnaire developed by Bayle *et al.* (7). They reported that skin diseases had a considerable impact on the prisoner; 50% often thought about their skin disease, 23% felt embarrassment, 35% felt anxious, and 23% felt sad about their skin disease. In our study, 22.5% often thought about their skin disease while 36% felt embarrassed, 34% felt anxious, and 45% felt sad about their skin disease. It is interesting to note that only 3% and 2% reported that they had to stop working and playing sports because of their skin disease, respectively. Even though the prevalence of diseases which associated with a substantial impact on quality of life such as psoriasis, vitiligo, and atopic dermatitis was low in our population, the skin diseases had a considerable impact on the prisoner. This impact was similar to quality of life impact in a free environment as reported by

Bingefors *et al.* (19). The authors concluded that skin disorders cause a significant decrease in health related quality of life regardless of the severity of the disease. We found no association between the responses in questionnaire and any kind of skin problems.

The prisoners were asked about the possible causes of their skin disease. Thirty-three percent blamed incarceration for the onset or aggravation of skin disease, while 31% blamed stress, and 19% blamed prison conditions. In the study of Bayle *et al.*, more than 70% of the prisoners directly blamed incarceration for their disease (7). This difference between the two studies might be explained by the fact that most of our patients reported living in a worse condition before incarceration. Twenty-four percent of our patients completed the (BDI); 47% of them were found to be in severe depression. This was a very high ratio when compared with the findings of a systematic review that reported major depression prevalence as 12% among female prisoners (10). However, this reflects a very small proportion of our prisoner population and may not reflect the overall prevalence. We could not find any association between BDI results and any kind of skin disease.

## CONCLUSION

Our study showed that there is no evidence that infections, infestations, and stressful conditions are more common in prisons in Turkey. The reasons for consultations are generally benign, and common conditions were similar to those in a free environment.

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