

## Original Article

# Prevalence and Clinical Characteristics of Scabies among Patients in Eastern Iran: A Study in Gonabad City, 2024

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## Abstract

**Background:** Scabies, caused by *Sarcoptes scabiei*, is common in Iran; however, epidemiological data from Gonabad City are scarce. Therefore, this study was conducted to determine the prevalence of scabies in patients referred to the dermatology clinic of Allameh Bohlool Gonabadi Hospital in Gonabad City and to investigate its associated risk factors.

**Methods:** A cross-sectional analysis was conducted in 2024 on 734 patients presenting with pruritic eruptions and itchy rashes. The diagnosis of scabies was confirmed in 98 patients by identifying *S. scabiei* mites, eggs, or fecal pellets through light microscopic examination of skin scrapings. Data from these confirmed cases were analyzed using SPSS v.25 to describe their characteristics.

**Results:** Among the 734 patients screened, 98 were confirmed to have scabies (13.4%). Analysis of these 98 cases revealed that the majority were female (64.3%, 63/98). The highest frequency of cases was observed in individuals aged 16 years and younger. Assessment of clinical presentation revealed that 55.1% (54/98) of cases presented with moderate lesions. A high proportion of cases were also among women, people with low levels of education and unemployed people.

**Conclusion:** This study identified a total of 98 scabies cases among 734 patients screened in Gonabad City. The infestation was significantly associated with being female, having a lower level of education, and unemployment. These findings highlight a distinct epidemiological pattern of scabies in this underserved region and underscore the need for targeted community screening and health education, particularly among the affected demographic groups. Further analytical studies are needed to confirm true risk factors at the population level.

**Keywords:** Scabies; *Sarcoptes scabiei*; Socioeconomic factors; Gender; Iran

## Introduction

Scabies, caused by the parasitic mite *Sarcoptes scabiei* var. *hominis*, is a highly contagious skin disease prevalent primarily in overcrowded environments with poor hygiene (1, 2). Characterized by intense itching and skin lesions, scabies spreads through direct skin contact or contaminated materials, often thriving in overcrowded environments with limited access to hygiene and healthcare (3, 4). Adult female

*S. scabiei* mites are larger than males, with an oval-shaped body, a flattened ventral surface, and a convex dorsal surface. Males are smaller, with a similar unsegmented body and four pairs of short legs, adapted for burrowing into the host's stratum corneum. These morphological differences facilitate the female's ability to dig tunnels and lay eggs in the epidermis. Adult female mites dig tunnels in the su-

perforial layers of the epidermis and lay 2 to 3 eggs daily (5). Clinical manifestations occur in three main forms (classic, nodular or a contagious crusted variant). Scabies can progress to secondary bacterial skin infections and may cause complications such as septicemia, kidney disease and rheumatic heart disease (6).

Globally, scabies affects millions, with a disproportionate burden in tropical and socio-economically disadvantaged regions, where prevalence can reach up to 20% in some communities (7). Population growth, lack of sanitation, war, famine and similar disasters are all factors in the increased incidence of scabies (8–10). Scabies in Iran occurs in different geographical locations and climates (6). A systematic review and meta-analysis showed that the prevalence of scabies eggs in Iran from 2000 to 2022 was 7%. According to the results of this meta-analysis, scabies prevalence has been reported in at least 21 provinces of the country (6). However, epidemiological data on scabies in specific regions, such as Gonabad City in eastern Iran, remain scarce, highlighting a critical gap in understanding local disease dynamics. Gonabad City is located in southern Razavi Khorasan Province, near the Afghanistan border. This semi-arid region faces unique socioeconomic and demographic challenges. Factors such as cross-border migration, low educational attainment and unemployment may contribute to heightened scabies transmission in this region, yet no studies have previously explored these dynamics in Gonabad City. Therefore, this study aimed to determine the prevalence of scabies among patients attending the dermatology clinic of Allameh Behloul Gonabadi Hospital in 2024 and to identify associated risk factors, providing critical insights for disease control in this underserved area.

## Materials and Methods

### Study area

This study was conducted in Gonabad City,

the capital of Gonabad County, located in the southern part of Razavi Khorasan Province, Eastern Iran. The geographical coordinates of Gonabad are 34°21'01.00"N and 58°41'00.10"E. As of the last national census in 2011, the population of Gonabad City was recorded at 36367, distributed across 10389 families. The city is located at an elevation of 1150 meters above sea level, within an arid to semi-arid climate zone characterized by an average annual rainfall of about 160 mm, an average yearly temperature of 17.3 °C (11).

### Study population and sample collection

A descriptive cross-sectional study was conducted involving 734 individuals who presented at the dermatology clinic of Allameh Behloul Gonabadi Hospital and were suspected of scabies in 2024. The inclusion criteria for the study were: patients with common symptoms of scabies, such as night itching and papulosquamous skin lesions or, if suspected, positive microscopic findings indicating the presence of the mite, residing in Gonabad City and absence of other papulovesicular pruritic diseases such as lichen planus, eczema, urticaria, dermatitis herpetiformis, etc. The exclusion criteria were unwillingness to participate in the study and failure to complete the checklist. Eligible participants were asked to complete a questionnaire covering demographic information. The questionnaire was physically provided to patients with eligibility criteria after the proposal was approved, the code of ethics was received and the necessary approvals for distributing the questionnaire were obtained from the relevant authorities. Necessary explanations were provided regarding the study's objectives and maintaining confidentiality and informed consent was obtained. Patient demographic data, including age (years), the severity of the lesion, gender, marital status, residence, level of education, job, location of the lesion and drug used, were collected. After disinfecting the skin with 70% alcohol, scrapings were taken from the margins of the

skin lesions using a sterile surgical blade or needle and a wet mount smear was prepared using 10% potassium hydroxide (KOH) to clear the specimen. Three slides were prepared for each patient (12). Due to incomplete demographic data for all cohorts of 734 screened patients, the analysis of characteristics such as gender, education, marital status, residence and employment status was conducted only on the subset of confirmed scabies cases.

### Statistical analysis

All statistical analyses were performed using SPSS version 25.0 (SPSS Inc., Chicago, IL, USA) for Windows. Given the incomplete demographic data for the entire patient cohort, the analysis was primarily descriptive. Descriptive statistics (frequencies and percentages) were used to summarize the clinical and demographic characteristics of the 98 confirmed scabies cases.

## Results

A total of 98 (13.4%) of the 734 patients screened were diagnosed with scabies. The demographic and clinical profile of these confirmed cases is described below.

### Demographic and socioeconomic profile of cases

Among the 98 scabies patients, the majority were female (64.3%, 63/98). The most frequently affected age group was individuals aged 16 years or younger (23.5%, 23/98), followed by those aged 46–60 years (22.4%, 22/98). Most patients were married (57.1%, 56/98) and resided in urban areas (54.1%, 53/98). A high proportion of patients had lower levels of education, with 28.6% (28/98) being illiterate and 35.7% (35/98) having less than a diploma. Furthermore, 61.2% (60/98) of the patients were unemployed.

### Clinical presentation

Assessment of clinical severity revealed that over half of the cases (55.1%, 54/98) had

moderate lesions, while 26.5% (26/98) had severe lesions and 18.4% (18/98) had mild lesions ( $P < 0.001$ ). Lesions were observed in multiple anatomical sites simultaneously in a majority of patients (Fig. 1). The hands were the most commonly involved site, affected in 60.2% (59/98) of cases, always as part of a multi-site infection. Involvement of sites other than the hands was observed in 22.4% (22/98) of cases. Isolated lesions were less common, found only on the legs in 10.2% (10/98) of patients and only on the hands in 5.1% (5/98). Lesions on the face, neck, or genital area were rare (1.0%, 1/98). The distribution of lesion locations was statistically significant ( $P < 0.001$ ). Figure 2 shows the *S. scabiei* isolated from a patient in this study. Tables 1, 2 and 3 show the frequency of variables associated with *S. scabiei*, lesion location based on age and severity of lesions based on age, respectively.

### Treatment

Regarding treatment, 55.1% (54/98) of patients used a combination of permethrin cream and ivermectin tablets, while 44.9% (44/98) used permethrin cream alone.



**Fig. 1.** Scabies lesions of patients referred to the skin clinic of Allameh Bahloul Gonabadi Hospital in 2024

**Table 1.** The frequency of variables associated with *S. scabiei* in Gonabad City in 2024

| Variables              | Levels                                                                   | Frequency | Percent | P-value |
|------------------------|--------------------------------------------------------------------------|-----------|---------|---------|
| Age (years)            | 16≤                                                                      | 23        | 23.5    | 0.521   |
|                        | 17–30                                                                    | 21        | 21.4    |         |
|                        | 31–45                                                                    | 19        | 19.4    |         |
|                        | 46–60                                                                    | 22        | 22.4    |         |
|                        | >60                                                                      | 13        | 13.3    |         |
| Severity of the lesion | Mild                                                                     | 18        | 18.4    | <0.001  |
|                        | Moderate                                                                 | 54        | 55.1    |         |
|                        | Severe                                                                   | 26        | 26.5    |         |
| Gender                 | Female                                                                   | 63        | 64.3    | 0.005   |
|                        | Male                                                                     | 35        | 35.7    |         |
| Marital status         | Married                                                                  | 56        | 57.1    | 0.157   |
|                        | Single                                                                   | 42        | 42.9    |         |
| Residence              | Urban                                                                    | 53        | 54.1    | 0.419   |
|                        | Rural                                                                    | 45        | 45.9    |         |
| Level of education     | Illiterate                                                               | 28        | 28.6    | 0.023   |
|                        | Less than a diploma                                                      | 35        | 35.7    |         |
|                        | Diploma                                                                  | 20        | 20.4    |         |
|                        | Academic                                                                 | 15        | 15.3    |         |
| Job                    | Unemployed                                                               | 60        | 61.2    | 0.026   |
|                        | Employed                                                                 | 38        | 38.8    |         |
| Location of the lesion | Face and neck                                                            | 1         | 1.0     | <0.001  |
|                        | Hands                                                                    | 5         | 5.1     |         |
|                        | Feet                                                                     | 10        | 10.2    |         |
|                        | Genital area                                                             | 1         | 1.0     |         |
|                        | Simultaneous involvement of the face and neck, legs, genitals, and hands | 59        | 60.2    |         |
|                        | Simultaneous involvement of the face and neck, legs, and genitals        | 22        | 22.4    |         |
| Drug used              | Permethrin cream                                                         | 44        | 44.9    | 0.312   |
|                        | Permethrin cream + Ivermectin tablet                                     | 54        | 55.1    |         |

**Table 2.** Frequency distribution of scabies lesion location based on age in Gonabad City in 2024

| Lesion location                                                         |        | ≤16    | 17–30  | 31–45  | 46–60  | >60    | Total  |
|-------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|
| Face and neck                                                           | Number | 0      | 1      | 0      | 0      | 0      | 1      |
|                                                                         | %      | 0.00   | 4.80   | 0.00   | 0.00   | 0.00   | 1.00   |
| Hands                                                                   | Number | 2      | 0      | 0      | 2      | 1      | 5      |
|                                                                         | %      | 8.70   | 0.00   | 0.00%  | 9.10   | 7.70   | 5.10   |
| Feet                                                                    | Number | 3      | 0      | 1      | 3      | 3      | 10     |
|                                                                         | %      | 13.00  | 0.00   | 5.30   | 13.60  | 23.10  | 10.20  |
| Genital area                                                            | Number | 1      | 0      | 0      | 0      | 0      | 1      |
|                                                                         | %      | 4.30   | 0.00   | 0.00   | 0.00   | 0.00   | 1.00   |
| Simultaneous involvement of the face and neck, legs, genitals and hands | Number | 15     | 16     | 7      | 13     | 8      | 59     |
|                                                                         | %      | 65.20  | 76.20  | 36.80  | 59.10  | 61.50  | 60.20  |
| Simultaneous involvement of the face and neck, legs and genitals        | Number | 2      | 4      | 11     | 4      | 1      | 22     |
|                                                                         | %      | 8.70   | 19.00  | 57.90  | 18.20  | 7.70   | 22.40  |
| Total                                                                   | Number | 23     | 21     | 19     | 22     | 13     | 98     |
|                                                                         | %      | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

**Table 3.** Frequency distribution of scabies lesion severity by age in Gonabad City, 2024

|                 |        | ≤16    | 17–30  | 31–45  | 46–60  | >60    | Total  |
|-----------------|--------|--------|--------|--------|--------|--------|--------|
| <b>Mild</b>     | Number | 8      | 3      | 1      | 2      | 4      | 18     |
|                 | %      | 34.80  | 14.30  | 5.30   | 9.10   | 30.80  | 18.40  |
| <b>Moderate</b> | Number | 10     | 12     | 9      | 15     | 8      | 54     |
|                 | %      | 43.50  | 57.10  | 47.40  | 68.20  | 61.50  | 55.10% |
| <b>Sever</b>    | Number | 5      | 6      | 9      | 5      | 1      | 26     |
|                 | %      | 21.70% | 28.60  | 47.40  | 22.70  | 7.70   | 26.50  |
| <b>Total</b>    | Number | 23     | 21     | 19     | 22     | 13     | 98     |
|                 | %      | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |



**Fig. 2.** *Sarcoptes scabiei* adult female with eggs isolated from a positive patient referred to the skin clinic of Allameh Behlul Gonabadi Hospital in 2024

## Discussion

Epidemiological studies can provide valuable insight into the prevalence of scabies in different parts of Iran and the world. This descriptive study characterized the clinical and demographic profile of scabies cases diagnosed at a dermatology clinic in Gonabad City, revealing a notable burden of the disease in this region.

The present study found that 13.4% of patients presenting with pruritic symptoms were infected with *S. scabiei*. This prevalence is higher than the 7% reported in a systematic review and meta-analysis of different provinces in Iran from 2000 to 2022 (6), indicating that

scabies represents a significant local health issue in Gonabad City. This rate is similar to reports from Kabul, Afghanistan (15.94%), a region in proximity to Gonabad (13) and other high-prevalence settings, such as the Solomon Islands and Cameroon (14–16). The variation in scabies rates globally is influenced by factors such as socioeconomic conditions, personal hygiene and access to healthcare (17–19). However, Gonabad's dry climate is theoretically less favorable for scabies transmission compared to humid regions (20). The high number of cases we observed suggests other potent drivers are present. One contributing factor may be the region's proximity to Afghanistan and the associated population movements, which can facilitate the spread of infectious diseases like scabies, particularly when combined with limited healthcare access (21, 22).

Analysis of the 98 confirmed cases revealed a distinct profile. The majority of patients were female (64.3%), young (with the highest frequency in individuals aged 16 or younger) and had lower levels of education or were unemployed. It is essential to note that without complete demographic data for the entire patient cohort, this profile describes the composition of the infected group but cannot be interpreted as indicating an increased risk. Nonetheless, this pattern is consistent with the demographics often reported in scabies case series from underserved populations, where socioeconomic deprivation can limit access to education, healthcare and preventive resources (6). The clinical findings are especially concerning.

Over half of the cases (55.1%) showed moderate lesions, while 26.5% had severe lesions, suggesting that patients often arrive at the clinic with advanced disease. This high prevalence of moderate-to-severe lesions raises the risk of secondary bacterial infections, such as impetigo, which can cause serious complications like septicemia, particularly in resource-limited settings (23). The distribution of lesion sites was also notable, with the hands being the most frequently affected area (60.2% of cases involving the hands as part of a mixed infection). This finding underscores the role of hand contact in the transmission of mites, both to other body sites and to other individuals (17, 24).

A key limitation of this study is the lack of complete demographic data for the entire cohort of 734 screened patients. This prevented the calculation of true prevalence within demographic subgroups and the identification of population-level risk factors through comparative statistical tests. Therefore, the demographic profile we describe should be seen as generating hypotheses for future research rather than confirming associations. Future analytical studies with complete population data are essential to definitively identify risk factors and inform targeted public health interventions in this region.

## Conclusions

Despite its limitations, this study clearly demonstrates that scabies is a common and clinically significant problem in Gonabad City, with a case profile suggestive of a disproportionate burden on females, the young and the socioeconomically disadvantaged. These findings highlight an urgent need for integrated public health strategies, including community-based screening programs, health education on personal hygiene and early recognition of symptoms and improved access to effective treatment. Such measures are crucial to break the cycle of reinfection and prevent the severe complications of this neglected disease, partic-

ularly in underserved regions like Gonabad City.

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## Ethical considerations

The code of ethics of this plan is (IR.GMU.REC.1403.116). Before sample collection, written informed consent was obtained from the participants.

## Conflict of interest statement

The authors declare there is no conflict of interest.

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