

Assessment of Knowledge and Fear of Scabies in a Saudi Population

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Background and Objectives: Scabies is a common contagious parasitic dermatological illness. In 2017, WHO recognized scabies as a neglected tropical disease. The aim of the present research was to assess the level of knowledge and fear of scabies among the Saudi population.

Methods: This is a cross-sectional online study conducted in the western region of Saudi Arabia from January to September 2019. We used a validated, 12-questions questionnaire to assess the scabies knowledge and the Fear of Scabies Scale-10 (FSS-10) to determine the level of fear toward scabies.

Results: A total of 3778 respondents were included with majorities of them being female and between the age of 15–30 years. About 93.3% of the respondents were considered to have good level of knowledge towards scabies and those were more likely to be females, live in an urban area, have heard about scabies in the past, younger in age, achieved higher educational level, and work for the medical and general education sector (all $P < 0.001$). The total possible scores ranging from 10 (less fear) to 40 (greater fear). The mean total FSS-10 score was 33 ± 4.46 with 58.3% of them were considered to have greater fear and those were more likely to be female, younger in age, educated with higher educational degree, work for the general education sector and medical and, but less likely to be unemployed (all $P < 0.001$). Partial correlation adjusting for potential confounders showed significant positive correlation between FSS-10 score and the scabies knowledge score ($r = 0.152$, $P < 0.001$).

Conclusion: Despite the good level of scabies knowledge, the level of fear towards scabies is high. Further educational programs recommended decreasing the negative effect of scabies on the community and the individuals' quality of life.

Keywords: scabies, knowledge, fear, skin, infection, Saudi

Introduction

Scabies is a contagious parasitic dermatological disease caused by the microscopic mite, *Sarcoptes scabiei* variety *hominis*.¹ Scabies is transmitted by either direct or indirect contact through sharing towels, bedding, clothing, or any other objects.² So, scabies transmission can be limited by avoiding skin to skin contact, avoiding sharing personal devices, and improving personal hygiene, especially in crowded places.³ The most common symptom of scabies is pruritus, which is especially aggravated at night. Also, it might present with a papular rash and excoriations.^{4,5} The scabies burrow is a pathognomonic sign that is useful for the definitive diagnosis of classical Scabies.⁶ But Scabies not always present in the classical type. The non-classical types include

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Crusted scabies, Nodular Scabies, Clean man scabies, infants and newborn Scabies, and Scabies incognito. Crusted Scabies is observed mainly in immunocompromised patients. It is characterized by hyperkeratotic skin crust that appears on the palms, soles, extensor surfaces, and under the fingernails.⁷

Nodular Scabies is caused by a hypersensitivity reaction to scabies mites.⁸ It appears as persistent pruritic nodules commonly in the axilla, Genitalia, and scrotum.^{9,10}

Clean man scabies occurs in a clean environment and not secondary to lousy hygiene. It is present as pruritus without scabetic lesions. Infants and newborn scabies characterized by vesicles and pustules in palms and soles. Also, it is rare to see the burrows except in the scalp and face. The last atypical type is Scabies incognito. This type occurred in a patient who used topical or systemic corticosteroid, which relieves itching. So, it is not easy to diagnose.¹¹

Scabies can be diagnosed by skin scrapings, a burrow ink test, and dermatoscopy.⁵

The recommended treatment of scabies is oral ivermectin, benzyl benzoate lotion, and permethrin cream.³ Scabies is correlated with an increase in morbidity and mortality through progress to secondary bacterial infections, then sepsis, which is a life-threatening condition.^{5,12} Otherwise, scabies can lead to depression and insomnia. The risk of scabies is not restricted to health problems, as it also affects social status, work attendance, and leads to high financial costs.^{5,13}

Scabies is a common dermatological disease and a growing public health concern. Over recent years, scabies has affected about 300 million people worldwide.¹⁴ In 2017, the World Health Organization recognized scabies as a neglected tropical disease.^{15,16} Evidence suggests that the highest prevalence of scabies is present in low-income areas.¹⁷ Also, its prevalence is high in Middle Eastern countries, such as Iran, Lebanon, Egypt, and Saudi Arabia.^{18–21} Because of its high prevalence in the poor, crowded areas, scabies is considered one of the most significant challenges to the Saudi Ministry of Health.²¹ The outbreak of scabies in the western region of Saudi Arabia was a critical event of 2018, where the Saudi Ministry of Health recorded more than 1000 cases among the schoolchildren in

Makkah city.²² In 2000, 18 workers at the crowded fields in Jeddah city were diagnosed to have scabies.²¹ Because of the hot weather, the recurrence rate of scabies is high in the western region of Saudi Arabia.²³

In 2019, the Indian education program of scabies was initiated, which included 50 mothers. Its results showed significantly inadequate knowledge about scabies among the respondents before this education program.²⁴ Guinea-Bissau's study in 2018 reported that there is a misunderstanding among the population regarding the causes and transmission routes of scabies, and the role of personal hygiene as a preventive measure against it.¹³ Likewise, a cross-sectional study among the Pakistani population also showed a significant lack of awareness about scabies.²⁵

A previous study assessed knowledge, attitude, and practice of scabies among Saudi medical students, which showed that they have a good knowledge level regarding scabies.²⁶ Another study conducted among the general population in Saudi Arabia to assess their awareness about scabies and its results showed that their awareness was satisfactory regarding the ways of transmission and symptoms of scabies. However, there is inadequate awareness of the preventive methods of scabies.²⁷

Recently, after the spread of the disease, many Saudi people felt overwhelmed and panicked. This panic was driven by unawareness of the disease, the possibility of death secondary to the disease, and whether it can be prevented or cured.²² Nevertheless, few studies have addressed the issue of scabies in Saudi Arabia. Here, this study provides a new insight about knowledge and fears of scabies disease among the Saudi population.

Materials and Methods

Study Area

We conducted a cross-sectional study from January 31st until September 30th, 2019 in the western region of Saudi Arabia to assess the knowledge of scabies and scabies fearing scale among the general population. Anyone above the age of 18 years was invited to participate in this study through an online invitation. The study proposal was submitted to the Taif University

School of Medicine Ethical Committee and was approved (number 39–36-0047). All participants agreed to participate in this study before filling the questionnaire and an online informed consent was used as well as this study was conducted in accordance with the Declaration of Helsinki.

Collecting Data

The data were collected via electronic distribution of validated questionnaire using Google forms. The link was circulated through different social media apps and it was restricted to single response per user. The questionnaire was divided into three parts. The first part included questions about the baseline characteristics of the respondents, including the socio-demographic data, educational level, residency, occupational field, and personal experience about having scabies or living with someone who was diagnosed with scabies.

The second part included 12 questions to assess scabies knowledge;²³ each question has three marks if answered (correct=3, might=2, wrong=1), and the maximum total mark was 36. The level of respondent's knowledge was considered good if the score was more than or equal to 27, moderate if between 15–26, and poor if 14 or below.

The third part of the questionnaire focused on the scabies fearing scale³¹ to assess the level of fear and discomfort of the population towards scabies, which can help to determine the ideal psychosocial support along with education programs about scabies. The Fear Scabies Scale (FSS-10 scale) was used to determine the level of fear/discomfort towards scabies. This scale includes 10 questions with each to be answered with strongly agree, agree, disagree, or strongly disagree on a four-point scale, with total possible scores ranging from 10 (less fear) to 40 (greater fear). Those who scored <33 was considered to have less fear while those who scored ≥ 33 was considered to have greater fear. We excluded the incomplete responses.

Data Analysis

All completed online questionnaires were collected in an Excel spreadsheet and verified, coded and entered to the Statistical Package for the Social Sciences program (SPSS) version 21 which was used to analyze the data.

The descriptive statistical analysis in the SPSS program was employed to represent the demographic data and the distribution of knowledge by frequencies and percentages. Also, means and standard deviations (SD) were used to calculate the total fear of scabies scale score-10. Chi-square test was used to compare the level of knowledge and FSS-10 according to the demographic data. Partial correlation was used to evaluate relationship between FSS-10 and level of knowledge. We considered P-value ≤ 0.05 to be statistically significant.

Results

A total of 3778 respondents participated in this study with majorities of them were female and between the age of 15–30 years (Table 1). More than 90% of the sample live in urban area. Respondents mostly work for the general educational sector followed by medical sector while the least percent of them work for the military section. Most of the respondents were college students and has bachelor's degree while only 1.3% were illiterate.

Overall, 93.3% of the respondents were considered to have a good level of knowledge towards scabies (Figure 1). Most respondents answered all the questions correctly, except one question about the signs and symptoms of scabies where only 22.1% of respondents answered it correctly. The question of "Can scabies be harmful to the health of skin?" was the most correctly answered question (Table 2).

Regarding the respondents' level of knowledge and when compared to those with moderate knowledge, those with good knowledge were more likely to be females ($P < 0.001$), live in an urban area ($P < 0.001$), have heard about scabies in the past ($P < 0.001$), younger in age ($P < 0.001$), achieved higher educational level ($P < 0.001$), work for the medical and general education sector ($P < 0.001$), but were less likely to have an affected family member with scabies ($P < 0.001$) and to have an affected family member with scabies ($P < 0.001$) (Table 3).

The total mean score of FSS-10 was 33 ± 4.5 which indicated a direction toward a higher and greater fears (Table 4). The respondents highest score mean was for the statement, "I would avoid interaction with others if I had scabies" followed by the statement of "I am afraid of contracting scabies". While the lowest score mean was for

Table 1 Demographic Data of the Respondents

Variables		Frequency	Percentage (%)
Gender	Male	691	18.3
	Female	3087	81.7
Residence	Urban area	3509	92.9
	Rural area	269	7.1
I have heard about scabies disease before	Yes	3487	92.3
Affected family member with Scabies	Yes	360	9.5
Age (years)	15–30	2146	56.8
	31–45	1112	29.4
	46–60	468	12.4
	>60	52	1.4
Educational level	Illiterate	47	1.2
	Elementary school	48	1.3
	Intermediate school	180	4.8
	High student	761	20.1
	Bachelor's degree	2567	67.9
	Master's degree	114	3
	Ph.D.	61	1.6
Occupational field	General educational sector	1803	47.7
	Medical sector	958	25.4
	Commercial sector	252	6.7
	Military sector	152	4
	Unemployed	316	16.2

the statement, “I would try to seek immediate medical help if I had scabies” followed by the statement of “I would feel ashamed if I had scabies”.

58.3% of the respondents were considered to have greater fear based on the mean total FSS-10 score. Compared to those with less fear, those with greater fear were more likely to be female ($P < 0.001$), younger in age ($P < 0.001$), educated with higher educational degree ($P < 0.001$), work for the general education sector and medical sector but less likely to be unemployed ($P < 0.001$), while who live in urban area ($p = 0.159$), have heard about scabies in the past ($P = 0.308$) and have an affected family

member with scabies ($P = 0.136$) showed no statistical significant (Table 5).

Partial correlation adjusting for age, gender, residence area, occupation and education showed significant positive correlation between FSS-10 score and the scabies knowledge score ($r = 0.152$, $P < 0.001$).

Discussion

In the present study, we attempted to assess the level of knowledge of scabies during an endemic with emphasis on the fear of contracting scabies. The general risk factors of scabies are immunocompromised patients,

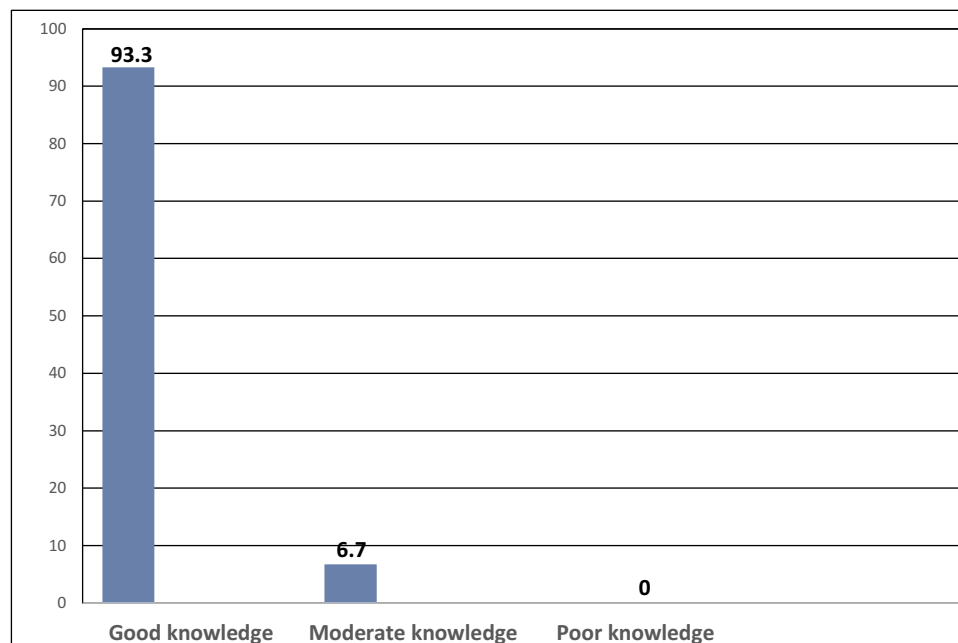


Figure 1 Distribution of the respondents according to their knowledge level about scabies.

poverty, and overcrowding. However, in Makkah 2018 outbreak, none of these risk factors were significant among the infected patients who are mostly Saudi healthy individuals which made the lack of knowledge the suggested predisposing factor in that outbreak.²⁸ Here, the inclusive results indicate that the knowledge towards scabies is significantly high in our findings compared to other studies conducted in low-income endemic countries such as Pakistan, India, Guinea-Bissau and Indonesia.^{13,24,25,29} Also, it is higher than that of the studies conducted in Saudi Arabia previously. This knowledge relies mostly on the awareness campaigns about Scabies on social media by the Saudi Ministry of health.³⁰ Likewise, the knowledge and FSS-10 scale are both greater in our findings than that of the US college students.³¹

This study questionnaire, the lowest level of knowledge was in the clinical presentation of Scabies, where 22% of the respondents answered it incorrectly. However, almost 76% have answered overall questions correctly. Comparably, a similar study conducted among Saudi medical students which showed high

awareness level among them while 21.6% of them misstated in answering the “common feature of scabies” questions.²⁶ This result is also consistent with data obtained in study conducted among Al-Madinah Almunawarh population which showed enough levels of the general knowledge regarding the various aspects of Scabies.²⁷ By contrast, a study conducted in Indonesia reported low knowledge about the causative organism and the preventive measures of scabies.²⁹ Singg S. (2015) showed that 94% of college students of United States had poor awareness of Scabies.³¹

The present results showed statistically significant difference between the level of knowledge and all the demographic data that has been studied, including gender, residency, educational level and occupational field. It has been reported that the knowledge and attitude towards scabies is good among the medical and nursing student’s community.^{26,32} Our study showed similar findings were Bachelor’s degree holders, general educators and medical professionals have greater knowledge compared with the rest of the respondents, which can be explained by the fact that the more urban and educated are the more likely to be knowledgeable.

Table 2 The Level of Knowledge Questionnaire with All Answers

Question About knowledge	Choices	Frequency	Percentage (%)
1- Have you ever heard about scabies disease?	*Yes	3487	92.3
	No	291	7.7
2- What is its cause (etiology)?	*Sarcoptes scabiei	2883	76.3
	Germes	817	21.7
	Scratching	77	2
3- What are its signs and symptoms?	*Small to large spots which are reddish and wet	835	22.1
	Itching at night and feeling hot	2856	75.6
	Pus containing vesicles	87	2.3
4- Which Parts of body are affected with scabies?	*Between fingers, armpits, waist, genitals, elbows, and wrists	2989	79.1
	Parts that are often being covered	691	18.3
	Mostly at the genital area	98	2.6
5- What is the mode of transmission of scabies disease?	*Skin to skin contact and through clothes, towels, bed linens, and Other things used by the patient	3331	88.2
	Through skin contact only	275	7.3
	Through clothes and bed linens only	172	4.6
6- Which age groups can be infected with scabies?	*All age groups but it is more common in teenagers	3102	82.1
	Teenagers only	130	3.4
	Certain age groups only	546	14.5
7- Is exchanging clothes with an infected person associated with increased transmission of scabies?	*Yes, it is	3337	88.3
	Only when the immunity is low	340	9
	No, it is not	101	2.7
8- Can scabies be harmful to the health of skin?	*Yes	3514	93
	No	264	7
9- Does the patient need to be quarantined?	*No, the patient just needs regular treatment	1515	40.1
	No, but persons should keep a distance from the patient	1030	27.3
	Yes, the patient needs to be quarantined	1233	32.6
10- What should we do to break the chain of scabies disease?	*Disinfection of clothing, bed linens and administration of treatment simultaneously	2932	77.6
	Keep a distance with others when being infected	601	15.9
	Regular treatment only	245	6.5
11- Does drying mattress and pillows prevent scabies transmission?	*Yes	3178	84.1
	No	600	15.9

(Continued)

Table 2 (Continued).

Question About knowledge	Choices	Frequency	Percentage (%)
12-How can scabies be prevented?	Bath 2 times per day with soap and avoid direct contact with the patients	1364	36.1
	Bath 2 times per day and keep the cleanliness of clothes	767	20.3
	*Keep clothes, towels and bed linens from being contaminated with scabies patients	1647	43.6

Note: *The correct answer.

Table 3 Comparison of the Respondents According to Their the Level of Knowledge

		Good Knowledge		Moderate Knowledge		P value
		Frequency	Percentage (%)	Frequency	Percentage (%)	
Number of the participants		3526	93.3	252	6.7	n/a
Gender	Male	616	17.5	75	29.8	<0.001
	Female	2910	82.5	177	70.2	
Residence	Urban area	3299	93.6	210	83.3	<0.001
	Rural area	227	6.4	42	16.7	
I have heard about scabies disease before		3329	94.4	158	62.7	<0.001
I have an affected family member with Scabies		291	8.3	69	27.4	<0.001
Age (years)	15–30	2037	57.8	109	43.3	<0.001
	31–45	1016	28.8	96	38.1	
	46–60	432	12.2	36	14.2	
	>60	41	1.2	11	4.4	
Educational level	Illiterate	33	0.9	14	5.6	<0.001
	Elementary school	38	1.1	10	4.0	
	Intermediate school	159	4.6	21	8.2	
	High student	701	19.9	60	23.8	
	Bachelor's degree	2431	68.9	136	54.0	
	Master's degree	106	3.0	8	3.2	
	Ph.D.	58	1.6	3	1.2	
Occupational field	General educational sector	1714	48.6	89	35.3	<0.001
	Medical sector	921	26.2	37	14.7	
	Commercial sector	220	6.2	32	12.7	
	Military sector	124	3.5	28	11.1	
	Unemployed	547	15.5	66	26.2	

Table 4 Distribution of Respondents Based on the Fear of Scabies Scale

Fear of Scabies Scale-10 (FSS-10) Item* (Mean \pm SD)	Mean \pm SD
1-I am afraid of contracting scabies	37.2 \pm 5.6
2-I would feel ashamed if I had scabies	25.3 \pm 12.8
3-If I had scabies, I would feel that I want to hide this disease	33.4 \pm 10.1
4-I would avoid interaction with others if I had scabies	38.3 \pm 5.5
5-I would try to seek immediate medical help if I had scabies	25.4 \pm 12.6
6-Having scabies would greatly restrict my life	35.5 \pm 8.6
7-I would avoid public bathrooms, theaters and others public places where I may be infected with scabies	30.0 \pm 11.6
8-I will not afraid if I have scabies because all the treatment is available	34.8 \pm 8.9
9-If I knew someone has scabies, I would stay away from him	34.8 \pm 8.9
10-If I had scabies, I would let the others know	35.3 \pm 7.4
The total (FSS-10) weighted score mean	33 \pm 4.5

Note:*The Fear of Scabies Scale-10 was adapted from: Singg S. Scabies Awareness and Fear of Scabies Scale-10. *J Clin Case Stud.* 2016;1(1):9–10.31 Copyright: © 2015 Singg S. Creative Commons Attribution License.

This study used the statements of FSS-10 scale to determine the level of fear/discomfort towards scabies. The results showed high fear scores, where the total mean score was 33 \pm 4.5 out of 40. In general, the statistically significant positive correlation between good level of knowledge and higher FSS-10 score may have been influenced by the social stigma of contracting scabies as the majority (38.28 \pm 5.52) would avoid interaction with others if they had scabies. Since female and urban had a greater FSS-10 score than the others, it is probably due to these two variables were the more presentable and knowledgeable in our study. Similarly, Singg S. (2015) showed that females had greater FSS-10 than males.³¹

The impact of these data has shed a light on the burden of scabies on the community and the quality of life of the individuals. It negatively interferes with sleep due to itching. Also, it affects the individual's work, social activity and psychological health due to stigmatization and feelings of shame.^{13,33} According to Global Burden of Disease study 2015, scabies is considered as a significant health burden in the tropical regions.³⁴ To prevent further outbreaks, it is recommended to raise community knowledge beside

application of management guidelines.²⁸ In COVID-19 pandemic during 2020, the reported increase of the scabies incidence rate supports the importance of public awareness.³⁵ It is recommended to conduct educational programs of scabies, its symptoms and transmission to high-risk groups to improve the prevention strategy.

Limitations

The current study has the following limitations. A low response from the males could affect the generalizability of the finding, the selection bias due to the web-based nature of the study, which is considered convenient sample.

Nonetheless, the strength point of this study is that it is the largest study in the western region of Saudi so far documenting the level of knowledge of scabies.

Conclusion

The most obvious finding to emerge from this study is that the level of fear and discomfort towards scabies is high, despite the good level of knowledge regarding the disease. Further educational programs are recommended to avoid the negative impact of scabies on the community and the quality of an individual's life.

Table 5 Comparison of the Respondents According to Their Fear Scabies Scale Score

		Greater Fear		Less Fear		P value
		Frequency	Percentage (%)	Frequency	Percentage (%)	
Number of the participants		2201	58.3	1577	41.7	n/a
Gender	Male	432	19.6	259	16.4	<0.001
	Female	1769	80.4	1318	83.6	
Residence	Urban area	2036	92.5	1473	93.4	0.159
	Rural area	165	7.5	104	6.6	
I have heard about scabies disease before		2036	92.5	1451	92.1	0.308
I have an affected family member with Scabies		220	10	140	8.9	0.136
Age (years)	15–30	1301	59.1	845	53.6	<0.001
	31–45	614	27.9	498	31.6	
	46–60	264	12	204	12.9	
	>60	22	1	30	1.9	
Educational level	Illiterate	20	0.9	27	1.7	<0.001
	Elementary school	25	1.1	23	1.5	
	Intermediate school	90	4.1	90	5.7	
	High student	449	20.4	312	19.8	
	Bachelor's degree	1521	69.1	1046	66.3	
	Master's degree	70	3.2	44	2.8	
Occupational field	General educational sector	1091	49.6	712	45.1	<0.001
	Medical sector	625	28.4	333	21.1	
	Commercial sector	140	6.4	112	7.1	
	Military sector	85	3.9	67	4.2	
	Unemployed	260	11.8	353	22.4	

Ethical Approval and Consent

The study was conducted in accordance with the Declaration of Helsinki. All participants agreed to participate before filling the questionnaire. The research project was approved by the research ethical committee at Taif university (Approval number 39-36-0047)

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Disclosure

The authors reported no conflicts of interest for this work.

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