

An epidemiological study on the prevalence and risk factors of contact dermatitis among healthcare workers in Iraq

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**An epidemiological study on ¹the prevalence and risk factors of
contact dermatitis among healthcare workers in Iraq**

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Abstract

Background. Occupational Contact Dermatitis (OCD) has a negative impact on workers' quality of life and ability to do their job. HCWs may have an elevated susceptibility to contact dermatitis as a result of frequent handwashing with soaps and disinfectants, as well as prolonged glove use during their workday.

Aim of study. To determine the prevalence of contact dermatitis among healthcare workers and to determine the sociodemographic, occupational characteristics associated with contact dermatitis.

Methodology. This is a cross sectional study that included 384 participants and was conducted at Baghdad, Iraq during the period from 9/7/2023 to 15/11/2023. An Arabic version of the Standardized Nordic Occupational Skin Questionnaire was used as an assessment tool for contact dermatitis.

Results. The prevalence of contact dermatitis was 31.8%. A significant association was detected between contact dermatitis and each of the following: female gender, elevated BMI, duration of glove use, frequency of hand washing, and history of allergy.

Conclusion. Based on the findings of the present study; female gender, higher BMI, longer duration of glove use, increased frequency of hand washing, and having a history of allergy were risk factors to develop contact dermatitis among Iraqi HCWs. More effective occupational health and safety training needs to take place in order to reduce the incidence.

Keywords: Contact Dermatitis, Healthcare Workers, quality of life, haptens, Standardized Nordic Occupational Skin Questionnaire

Introduction

The skin serves as the primary barrier between the human body and the external world, making the skin the organ most extensively subjected to a diverse array of external stimuli. Various external variables, such as trauma, exposure to harmful compounds, and the presence of haptens, have been shown to increase the inflammatory response in the skin. This leads to the activation of numerous

inflammatory cytokines, which ¹⁶ play a crucial role in eliminating the invading materials and protecting the human body. Nevertheless, these inflammatory reactions give rise to undesirable skin inflammation [1], and those who are affected often have a diminished quality of life due to painful skin inflammation or inflammatory responses.

¹ Occupational skin diseases are responsible for an estimated 25% of all lost work days [2]. Contact dermatitis ¹¹ is one of the most common occupational skin diseases in developed countries [3]. Contact dermatitis is distinguished by well-defined regions of skin inflammation that occur at locations where ⁶ the skin has come into contact with an irritant or allergen. The rash exhibits improvement with the removal of the causative agent. ³ Allergic contact dermatitis is characterized by the development of a skin rash, which may be triggered by even little exposure to chemicals that possess antigenic properties. Severe skin irritants have a tendency to induce the formation of red blisters or burns, whereas milder irritants result in the gradual development of eczematous alterations in the skin. The presence of a rash in regions that come into touch with oil, grease, or other chemicals may indicate a potential occupational etiology. The use of direct skin testing methods, such as patch or scratch testing, or radioallergosorbent testing, may be beneficial in the identification of a particular allergen. Occupational exposure to sunlight and certain chemicals ¹² has been identified as a potential factor contributing to the development of skin cancer, but with a considerable time lag before the manifestation of lesions. The implementation of workplace modifications and the adoption of preventive measures are crucial in mitigating future exposure among individuals afflicted with occupational skin disease^[2]. ² Occupational contact dermatitis (OCD) has a negative impact on workers' quality of life and ability to do their job [4]. ³ HCWs may have an elevated susceptibility to contact dermatitis as a

result of frequent handwashing with soaps and disinfectants, as well as prolonged glove use during their workday [5]. Hence, occupational contact dermatitis represents the prevailing manifestation of work-related skin disorders often seen by individuals in the healthcare field [6].

Methods

This is a cross sectional study that included 384 participants and was conducted at Baghdad during the period from 9/7/2023 to 15/11/2023. This study included healthcare workers (e.g., doctors, pharmacists, dentists, nurses, lab technicians, etc.). Exclusion criteria were those who were part of the hospital administrative staff and those who did not have direct contact with the patients (e.g. radiologists). A questionnaire-based interview was employed for data collection. The questionnaire consisted of the following:

1. Basic sociodemographic and job characteristics: (age, gender, marital status, income, occupation)
2. Preventive and risk factors of contact dermatitis (Compliance to periodic medical examination, occupational safety and health training, frequency of hand washing per day, pairs of gloves used per day, history of allergy, hours of gloves use per day).
3. The third part consisted of standardized Nordic Occupational Skin Questionnaire [7], which was translated into Arabic.

Work-related contact dermatitis as defined as a noninfectious condition that arises from skin exposure to substances encountered in the workplace. This exposure can be either through allergic or irritant contact. Symptoms of contact dermatitis were any of the following: redness, burning sensations, blistering, itching, dry skin, fissures, aching or pain, and crusting occurring in any region of the body within the preceding 12-month period [7].

Statistical analysis

Fischer's exact test was used to test the association between studied parameters. A p value <0.05 was considered statistically significant.

Results

Basic characteristics of the studied sample

The age distribution of the studied sample ranged from 24-63 years with a mean of 39.3 years \pm 9.0 SD. The studied sample showed female predominance, as the male to female ratio was 1: 1.95.

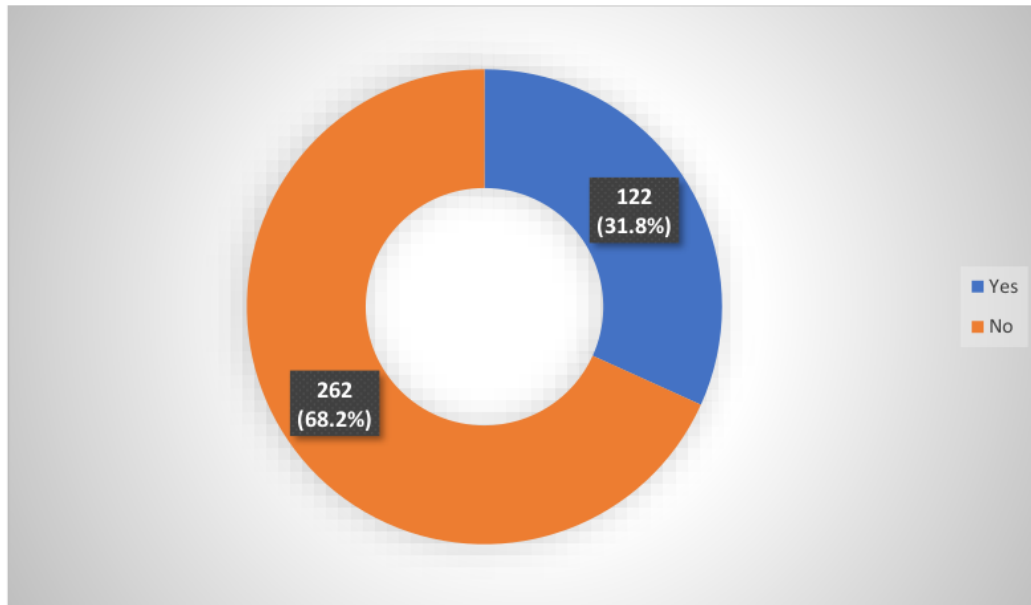
Variable	Frequency (N=384)	Percentage (%)
Age		
<40 years	204	53.1
\geq 40 years	180	46.9
Gender		
Male	130	33.9
Female	254	66.1
Marital status		
Married	295	76.8
Unmarried	89	23.2
Income		
<1000000 ID	105	27.3
\geq 1000000 ID	279	72.7
Occupation		
Doctor	142	37.0
Dentist	92	24.0
Pharmacist	18	4.7
Nurse	58	15.1
Others	74	19.3

Risk factors for contact dermatitis

Variable	Frequency (N=384)	Percentage (%)
Compliance to periodic medical examination		
Yes	218	56.8
No	166	43.2
Occupational safety and health training		
Yes	186	48.4
No	198	51.6

Frequency of hand washing per day		
1-5 times	125	32.6
6-10 times	155	40.4
11-20 times	78	20.3
1 >20 times	26	6.8
Pairs of gloves used per day		
<1 pair	186	48.4
1-5 pairs	132	34.4
>5 pairs	66	17.2
History of allergy		
Yes	108	28.1
No	276	71.9
Hours of gloves use per day		
<2 hours	236	61.5
2-6 hours	123	32.0
>6 hours	25	6.5

Prevalence of contact dermatitis



Variable	Contact dermatitis		P value
	No	Yes	
Age			
<40 years	142	62	0.583
	54.2%	50.8%	
≥40 years	120	60	
	45.8%	49.2%	
Gender			
Male	108	22	<0.001
	41.2%	18.0%	
Female	154	100	
	58.8%	82.0%	
BMI			
Normal weight	74	18	0.011
	28.2%	14.8%	
Overweight	140	80	
	53.4%	65.6%	
Obese	48	24	
	18.3%	19.7%	
Marital status			
Married	203	92	0.697

	77.5%	75.4%	
Unmarried	59	30	
	22.5%	24.6%	
Income			
<1000000 ID	75	30	0.461
	28.6%	24.6%	
≥1000000 ID	187	92	
	71.4%	75.4%	
Occupation			
Doctor	98	44	0.180
	37.4%	36.1%	
Dentist	62	30	
	23.7%	24.6%	
Pharmacist	16	2	
	6.1%	1.6%	
Nurse	34	24	
	13.0%	19.7%	
Others	52	22	
	19.8%	18.0%	

Variable	Contact dermatitis		P value
	No	Yes	
Compliance to periodic medical examinations			
Yes	144	74	0.320
	55.0%	60.7%	
No	118	48	
	45.0%	39.3%	
Occupational health training			
Yes	126	60	0.913
	48.1%	49.2%	
No	136	62	
	51.9%	50.8%	
Frequency of hand washing			
1-5 times	73	52	
	27.9%	42.6%	

6-10 times	123	32	0.001	
	46.9%	26.2%		
11-20 times	52	26		
	19.8%	21.3%		
>20 times	14	12		
	5.3%	9.8%		
Pair of gloves used				
<1 pair	118	68	0.175	
	45.0%	55.7%		
1-5 pairs	96	36		
	36.6%	29.5%		
>5 pairs	48	18		
	18.3%	14.8%		
History of allergy				
Yes	24	84	<0.001	
	9.2%	68.9%		
No	238	38		
	90.8%	31.1%		
Occupation				
<2 hours	150	86		0.001
	57.3%	70.5%		
2-6 hours	88	35		
	33.6%	28.7%		
>6 hours	24	1		
	9.2%	0.8%		

Discussion

Occupational contact dermatitis is a significant health concern associated to the workplace that has a pronounced impact on the well-being and productivity of workers.

The present study found that contact dermatitis had a prevalence of 31.8%. This finding is in concordance with Mekonnen et al. in Ethiopia who reported a prevalence of 31.8% [8]. Other studies in Bulgaria, Turkey, and Greece reported a prevalence of 58.5%, 61.7%, and 39.9%; respectively. The observed variations

might potentially be attributed to disparities in occupational sickness management and reporting practices, as well as the availability of methods across different nations.

This present study found that a history of allergy was significantly linked to the occurrence of contact dermatitis. This finding is in concordance with other studies [9,10]. One potential reason for this phenomenon might be that individuals with a pre-existing personal history of allergies may have an exacerbation of contact dermatitis. One potential explanation is that individuals with a preexisting history of allergies may be more prone to developing contact dermatitis, specifically allergic contact dermatitis, as a result of the activation of physiological pathways within the body, such as the IL-4/Th2 pathway. This heightened susceptibility to environmental triggers can contribute to an increased likelihood of experiencing an elicitation response [11].

In the current study, female patients had significantly higher prevalence of contact dermatitis. This is in concordance with Mauro et al. [12]. It is important to take into consideration behavioral factors, such as the use of personal care and housekeeping products, as well as engagement in outdoor job activities. These factors may contribute to the varying sensitization profiles seen between males and females.

The frequency of hand washing was also significantly associated with contact dermatitis, which is in concordance with Zorba et al. [13]. This phenomenon might be attributed to the fact that frequent hand washing can result in a significant level of exposure for workers to water (known as wet work) and cleaning chemicals, such as soap, which can potentially impact the integrity of the skin's outer layer. Frequent hand washing results in continuous cycles of wetting and drying, which leads to the depletion of protective substances on the skin. This depletion reduces

the skin's flexibility and increases its susceptibility to occupation-related contact dermatitis.

Surprisingly, health and safety training did not contribute to reducing the incidence of contact dermatitis. This reflects the possibility of ineffective training. Health and safety training has a crucial preventative function in mitigating many forms of occupational ill health, such as occupational-related contact dermatitis. The implementation of occupational health and safety training is often seen to have a positive impact on workers' knowledge and awareness about the avoidance and management of risks and hazards related to bad health conditions. This, in turn, tends to enhance the early detection and notification of such problems. Additionally, the timely provision of safety training to workers at their commencement of employment may enhance workplace safety cultures and practices.

The present study has also found that longer duration of glove use was significantly linked to increased incidence of contact dermatitis. One potential reason might be that the occlusion effects resulting from wearing pairs of gloves may compromise the barrier and exposure protection capabilities of the skin.

Conclusion

Based on the findings of the present study; female gender, higher BMI, longer duration of glove use, increased frequency of hand washing, and having a history of allergy were risk factors to develop contact dermatitis among Iraqi HCWs. More effective occupational health and safety training needs to take place in order to reduce the incidence.

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