

Prevalence of Hand Eczema among Women Attending Primary Health Care Centers in Karbala City-Iraq

Dr. Muna Sadiq Ibrahim¹, Dr. Ali Abdulridha Abutiheen², Dr. Fatima Abdulla AL-Hasany³

M.B.Ch.B. FABHS. (F.M). Al-Iskan Primary Health Care Centre\ Karbala Health Directorate¹

M.B.Ch.B. FIBMS. (F.M)

Family and Community Medicine department, College of Medicine, University of Karbala²

Munasadiq9@gmail.com

Received (03\12\2021), **Accepted** (16\03\2022)

Abstract

Hand eczema, also called hand dermatitis is a very common and widespread condition characterized by inflammation of the skin. Endogenous or exogenous factors could induce the pathogenesis. A cross-sectional study was carried out in Karbala city during the period from March 1st to July 31, 2017 aimed to identify the prevalence of hand eczema among women (15-49) years and to recognize the triggering factors and related conditions. A sample of 300 were selected from women who attended 4 primary health care centers in Karbala city through direct interview using a special questionnaire prepared for the purpose of study. Then women had been examined for evaluation of hand dermatitis. The prevalence of hand eczema was high (77.3%), the majority of affected women were single (94.4%) and in younger age group (15-24) years (86.4%), and which involve both hands in (87.1%). Roughness was the most clinical presentation (95.7%). The most frequent triggering factors was using soap and detergent (94%). The most frequent impact of hand eczema was psychological impact (71.6%). Therefore, hand eczema is a common condition among women in Karbala. Further, most of sampled women not using protective measures and not been evaluated or treated for hand eczema.

Keywords: Hand eczema, Housewife dermatitis, Roughness, childbearing age women, Karbala.

الخلاصة:

أكزيما اليد، وتسمى أيضًا التهاب جلد اليد، هي حالة شائعة جدًا وواسعة الانتشار تتميز بالتهاب الجلد، والذي يحدث بتأثير عوامل خارجية أو داخلية. أجريت دراسة مقطعية مستعرضة في مدينة كربلاء المقدسة خلال الفترة من 1 آذار إلى 31 تموز 2017 بهدف تحديد مدى انتشار أكزيما اليد بين النساء بعمر (15-49) سنة وكذلك للتعرف على العوامل المسببة والحالات ذات الصلة بأكزيما اليد. تم اختيار عينة من 300 امرأة ممن راجعن 4 مراكز للرعاية الصحية الأولية في مدينة كربلاء. حيث تم إجراء مقابلة مباشرة معهن باستخدام استبيان خاص أعد لغرض الدراسة. ثم تم فحص النساء لتقييم حالت التهاب الجلد في اليدين. كان انتشار أكزيما اليد مرتفعاً بنسبة (77.3٪)، وكانت الإصابات أكثر بين العازبات (94.4٪) وفي الفئة العمرية الأصغر (15-24) سنة (86.4٪). أغلب الحالات أصابت كلتا اليدين (87.1٪). وكانت الحشونة هي أكثر الأعراض السريرية تكراراً (95.7٪). بينما كانت أكثر العوامل المسببة شيوعاً هي استخدام الصابون والمنظفات (94٪). كان التأثير الأكثر شيوعاً لأكزيما اليد هو التأثير النفسي (71.6٪). من ذلك نستدل ان اكزيما اليد حالة شائعة بين النساء في كربلاء. علاوة على ذلك، فإن معظم النساء في العينة لم يستخدمن أي تدابير وقائية ولم يتم تقييمهن أو معالجتهن بما يخص أكزيما اليد.

Introduction

Hand eczema (HE) or dermatitis is an inflammatory condition of the skin of the hands, and it's the most frequent dermatosis related to the hand. HE signs differs including dryness, erythema, excoriation, exudation, fissuring, hyperkeratosis, lichenification, population, scaling, and vesiculation [1-3].

Hands are essential organs for daily domestic activities, communication, and for conducting different jobs activities. Inadequate appearance or performance can produce substantial mental and behavioural discomfort, as well as a lower standard of living. Therefore, it is vital to improve the outcome of HE sufferers. Where HE is more common in females [4,5].

Hand eczema is far more common among females. Therefore, a common form of it is the Housewives dermatitis that occurs due to mix effects of exposure to irritants, allergens and trauma in their work which involve cleaning, cooking, and caring of family members [6,7].

Risk factors for HE could be idiopathic or due to endogenous risk factors including atopy, leading to atopic dermatitis. Further, Hormonal changes, obesity, stress, and seasonal variation as cold and dry weather could aggravate HE. Furthermore, studies indicate a significant relationship between cigarette use and the severity of HE. While the exogenous factors could occupational or domestic that directly affect skin integrity, including, skin irritants, contact allergens, damp work, friction, mechanical skin irritation, and possibly cold and dry weather conditions, as well as lower indoor humidity [3, 8-12].

Hand eczema has a significant impact on patient's quality of life with physical, social, and psychological aspects and daily living. And presents a huge burden to patients, society and the health care system [5, 13-16].

Hand eczema is a worldwide disturbing problem, where people from many aspects of living are affected. HE onset is often show at the young active age, and usually takes a relapsing and chronic course [3, 5,17,18]. However, HE could be prevented or controlled by the usage of protective gloves, protective creams\ gels or what so-called barrier creams, cleansing with mild skin cleansers, and reducing the unnecessary hand washing or wetting hands. So patient education is a purposeful, personalized approach aimed at increasing information, changing behaviors, and adapting attitudes that lead to positive quality of life [19,20]. Nevertheless, in the absence of the desired care and therapy may grow into a chronic, debilitating condition that has a significant impact on individuals' daily activities.

Despite HE is one of the most prevalent skin disorders, and its prevalence is rising, estimating the prevalence of HE is difficult because not all patients recognize their ailment condition or seek treatment [20]. In addition, up to our knowledge this the first study been conducted in Karbala aiming to recognize the prevalence of hand eczema among women in the reproductive life, who attend primary health care (PHC) centers in Karbala city. And to recognize the triggering factors and related conditions. As well, as to give them, the advice to avoid the triggering factors and to use protective measures when it is required.

Subjects and methods.

An analytic cross sectional study conducted in Karbala city. Data collection was carried out during the period from March 1 to July 31, 2017. A sample of women attending randomly selected 4 out of 14 PHC centers from Karbala Center Health Sector in Karbala city were included in the study. Which are (Al-Mulhak, Al-Iskan, Al-Nasr, and Al-Abasia Al-Sharqia PHC centers), after exclusion of two difficult, to reach centers.

A sample of 300 women were selected on systematic random sampling technique, where every fourth woman presented to the PHC centers was chosen. Women at reproductive life aged 15-49 years, who live in Karbala city and had consented to participate in the study were included in the study.

A specific questionnaire was developed for the purpose of study and was filled through direct interviews with the women. The first part includes questions that were directed to assess their socio-demographic characteristics including age, residence, marital status, educational level, occupation, economic level, smoking and presence of any medical diseases, and use of medication.

The second part includes questions to assess if they had any signs and symptoms of hand eczema, including its duration, frequency per year, site of the lesions, personal and family history of atopic diseases, and age of onset. The time of exposure to water and detergent, the most recognizable things that worsen hand eczema, use of protective measures, impact of hand eczema on daily activity and the type of treatment. Then clinical examination was done to see and evaluate the site, type, and extension of hand eczema if present. The first researcher who is a practitioner dermatologist did all the interviews and examination.

A pilot study was conducted in AL-Mulhak PHC center, it was done over a period of two weeks on 20 women to assess the feasibility and appropriateness of questions in the questionnaire and to overcome any difficulties or related issues, that may arise during data collection. Based upon the pilot results minor modifications were performed and the duration time of interview was estimated at 10-15 minutes.

Ethical approval for the study was obtained from Iraqi Ministry of Health\ the Arab Board for Health Specialization section. Another approval from Research Ethics Committee in Karbala Health Directorate. Moreover, a verbal consent was taken from each woman prior to interview, after short explanation on the objectives of the study and assuring the confidentiality of answers and freedom to participate or not. So the participation was non obligatory but only 7 women (2.3%) refused to complete the interview mostly because they have not enough time.

Data was entered and analysed, using statistical package of social science program (SPSS software version 22). Continuous variables were presented as means with standard deviation (SD) while discrete variables presented as numbers (N) and percentages. Chi square test was used to test the significance of association between discrete variables. A P value of less than 0.05 was considered as statistically significant.

Results.

Of total women, the age range from 15 to 49 years with a mean age \pm SD of study participation was 30.6 ± 9.2 years. Majority of women (35.3%) were in age group 25-34 year, 67% from urban regions, most women are married (86.7%) with low education level (primary school) only (43%), most women are housewives (86%) and within middle economic level (60%). As shown in table 1.

Table 1. Distribution of study population according to socio-demographic characteristics of sampled women:

| Variable | Category | N=300 | 100.0% |
|-------------------------|------------|-------|--------|
| Age Group\ Years | 15-24 | 88 | 29.3% |
| | 25-34 | 106 | 35.3% |
| | 35-44 | 78 | 26.0% |
| | 45-49 | 28 | 9.4% |
| Residence Area | Urban | 200 | 66.7% |
| | Rural | 52 | 17.3% |
| | Slum | 48 | 16.0% |
| Marital Status | Single | 36 | 12.0% |
| | Married | 260 | 86.7% |
| | Divorced | 4 | 1.3% |
| Education | < 6 years | 44 | 14.7% |
| | 6-9 years | 129 | 43.0% |
| | 9-12 years | 75 | 25.0% |
| | > 12 years | 52 | 17.3% |
| Employment | Employed | 40 | 13.3% |
| | Housewife | 258 | 86% |
| | Free work | 2 | 0.7% |
| Economic Level | Good | 22 | 7.3% |
| | Middle | 180 | 60.0% |
| | Low | 98 | 32.7% |

Among those 300 women there were 232 (77.3%) have hand eczema. In addition, the 95% Confidence Interval for HE Prevalence = 72.1 % - 81.8% as shown in figure (1).

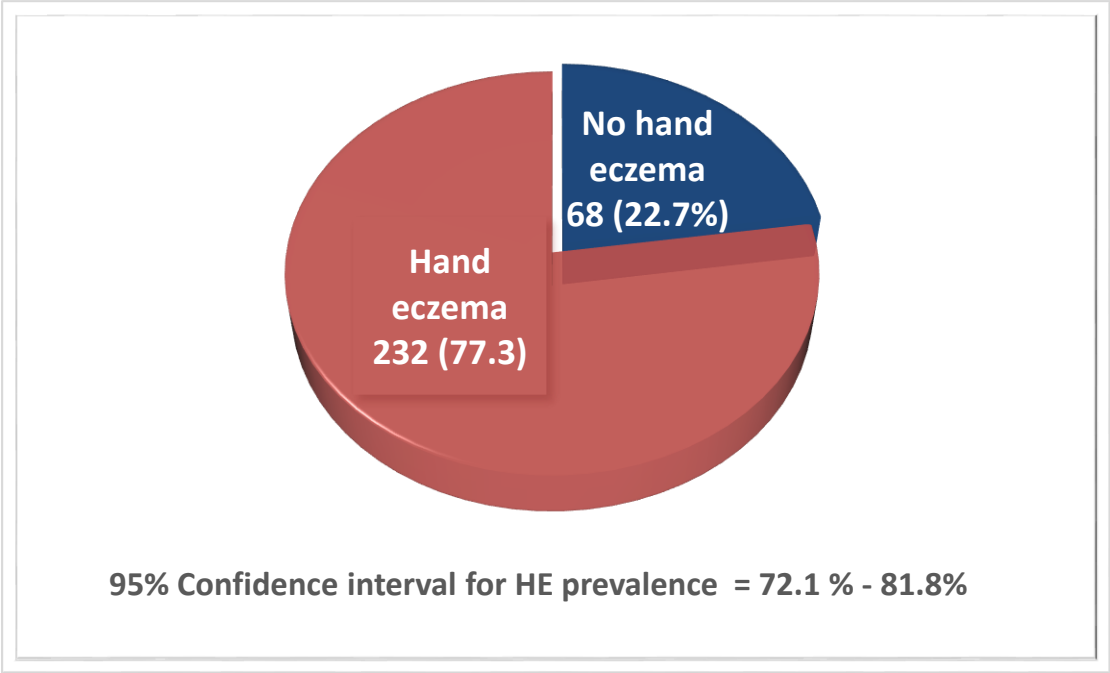


Figure (1): The prevalence of hand eczema among women in Karbala city.

The majority of women who have hand eczema involved both hands (87.1%) as shown in figure (2). In addition, the majority 214 (92.2%) of women who have hand eczema reported adulthood onset of hand eczema. While 18 (7.8%) reported childhood onset.

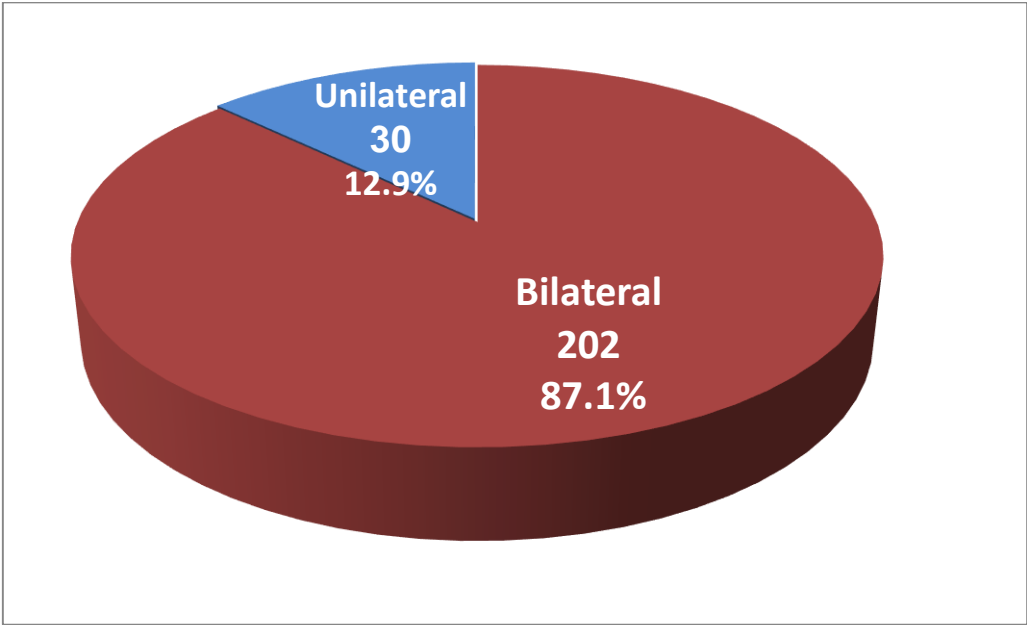


Figure (2): Distribution of women who have hand eczema according to involvement sites in Karbala.

The most frequent affected sites among women who have hand eczema were palms (91.4%) as shown in figure (3). While Roughness (95.7%) and scaly patches (51.3%) were the most clinical features identified as shown in figure (3).

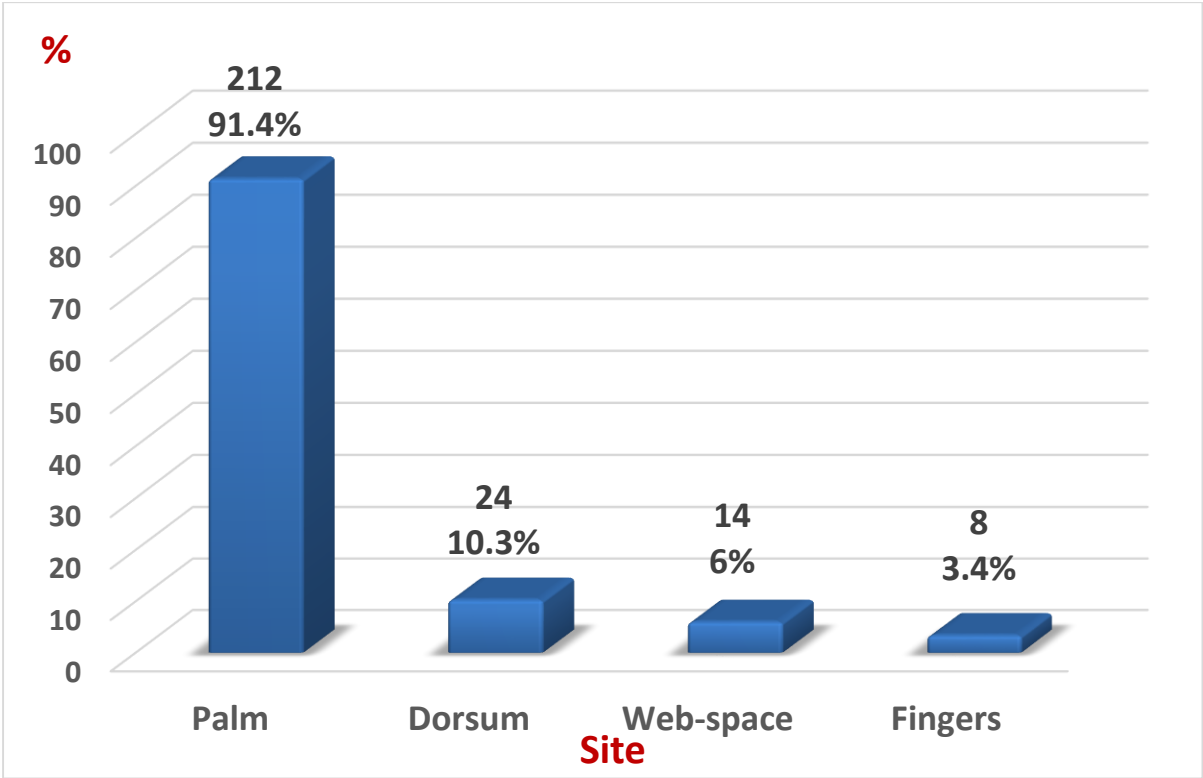


Figure (3)*: Observed frequency of affected sites of hand eczema among women in Karbala. *Overlap result

Roughness (95.7%) and scaly patches (51.3%) were the most clinical features in our study as shown in figure (4).

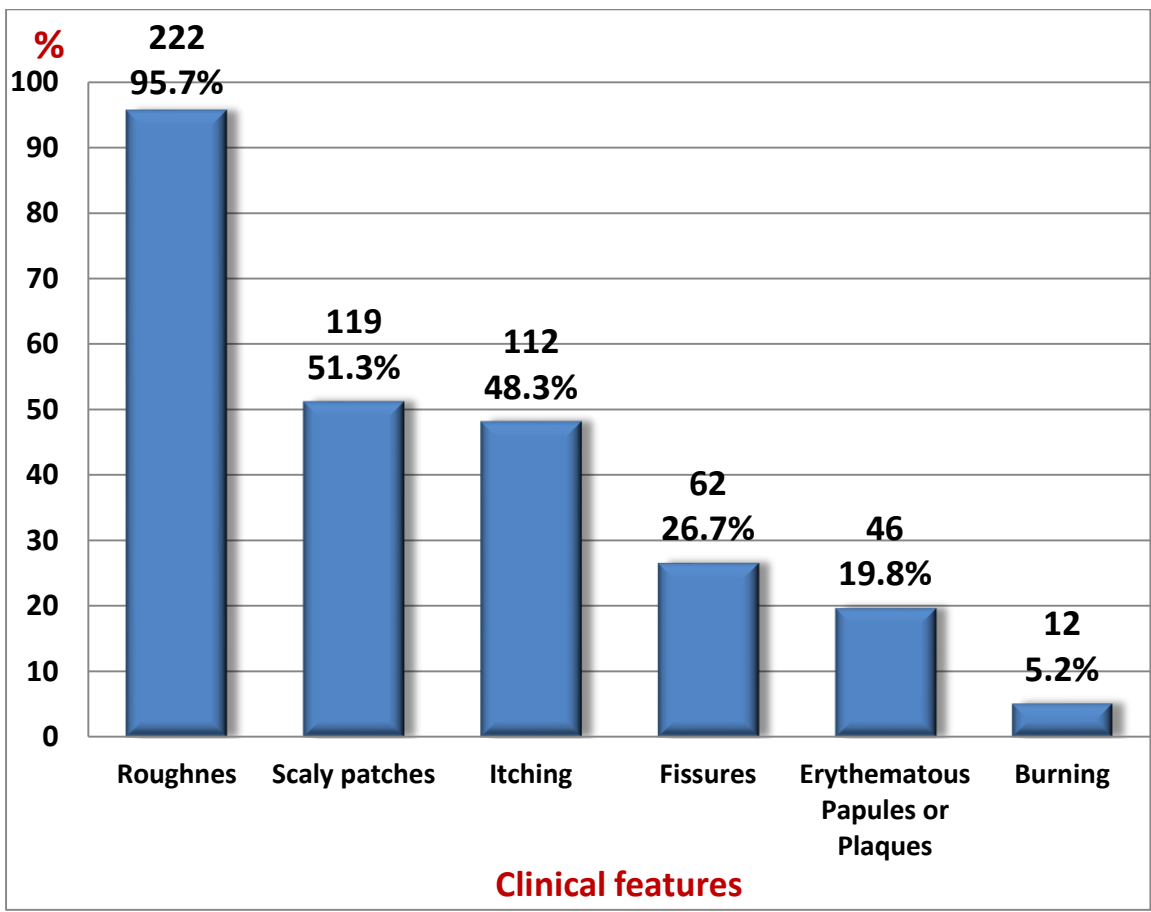


Figure (4)*: Observed frequency of clinical features of hand eczema among women in Karbala. *Overlap result

The most frequent aggravating factors of hand eczema were soap and detergent (94%). While the most frequent daily task that aggravates hand eczema was cleaning (94%). Further, (53.4%) of affected women indicated no seasonal variation for the HE, but slightly higher percentage indicate summer season over winter and other seasons. as shown in table 2.

Table (2): Distribution of affected women according to the presence of aggravating factors, activities, and seasonal variation.

| | Hand Eczema | |
|---|--------------------|---------------|
| Factor | N=232 | 100.0% |
| Aggravating factors | | |
| • Frequent washing | 32 | 13.8% |
| • Food stuffs | 44 | 19.0% |
| • Soap and detergents | 218 | 94.0% |
| • Others | 20 | 8.6% |
| Daily tasks\ activities | N | % |
| • Wash clothes by hands or by non-automatic machine | 186 | 80.2% |
| • Cooking | 202 | 87.1% |
| • Cleaning | 218 | 94.0% |
| • Care of U4 children | 120 | 51.7% |
| • Others | 42 | 18.1% |
| Season when eczema is most annoying | N | % |
| • The same | 124 | 53.4% |
| • Winter | 46 | 19.8% |
| • Spring | 6 | 2.6% |
| • Summer | 52 | 22.4% |
| • Don't know | 2 | 0.9% |
| • Winter & Spring | 2 | 0.9% |

**Overlap result*

Less than 10% of sampled women had use protective gloves as shown in figure (5). Further, the main source of information of sampled women about the protective measures was media reported by 108 (36%), and medical staff 86 (28.7%), while 62 (20.6%) did not receive any information. Furthermore, majority of affected women 149 (64.2%) did not receive any treatment while nearly one third 79 (34.1%) had treatment prescribed by physician.

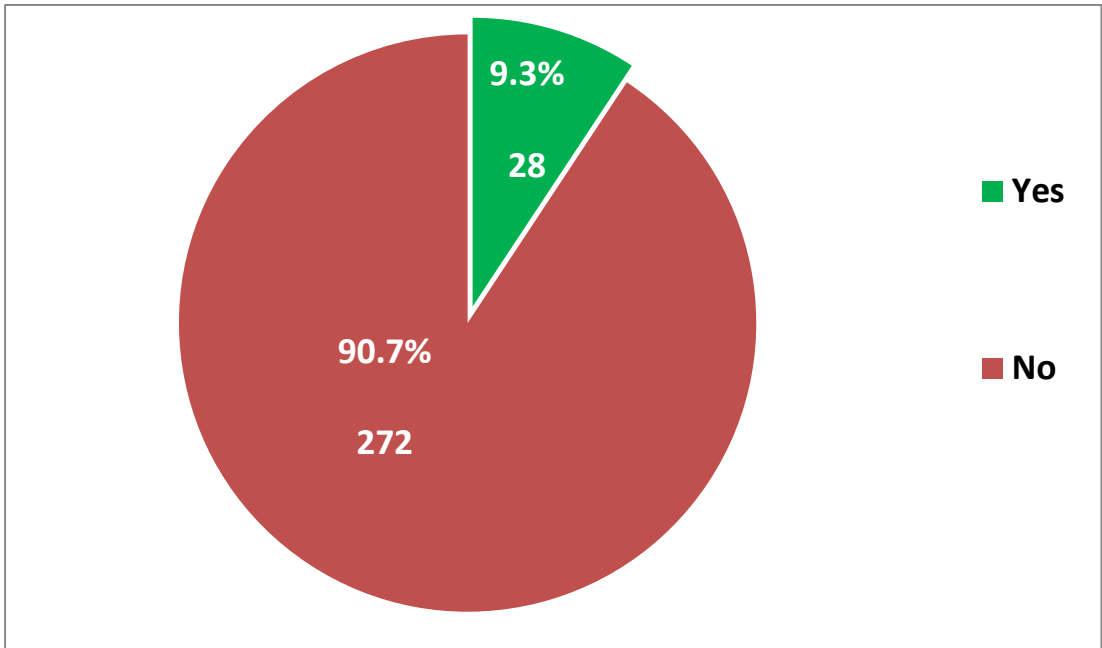


Figure (5): Distribution of sampled women according to the usage of protective gloves in Karbala

On other hand, the most frequent impact of hand eczema reported was psychological (71.6%) mainly (embarrassment, low self-esteem), and more than half of sample reported impact on work as shown in figure (6).

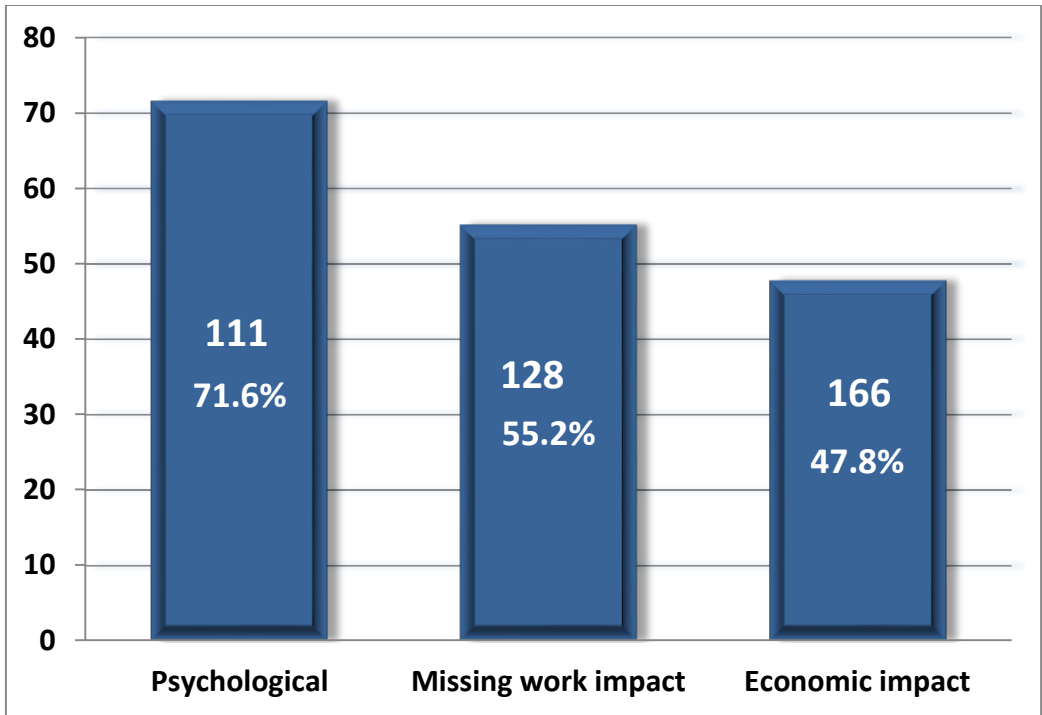


Figure (6): Observed frequency of impact of hand eczema of affected women in Karbala.*Overlap result

By the comparison between women who have hand eczema and those without hand eczema in relation to socio-demographic characteristic as shown in table 3. Hand eczema was higher among the (15-24) years old age group (86.4%) with a significant statistical association between hand eczema and age ($p = 0.009$). No statistically significant association for HE concerning residence though HE was slightly higher among women who live in slum area.

There was statistically significant association between hand eczema and the marital state ($p < 0.001$) which was more among single women (94.4%). While HE showed no significant association in relation to education, employment, economic level, and crowding index.

Table (3): Comparison between women who have hand eczema and those without hand eczema in relation to socio-demographic characteristic.

| Variable | Category | Total | Hand Eczema | | No Hand Eczema | |
|-----------------------|--------------------|-------|-------------|-------|----------------|--------|
| | | | n | % | n | % |
| Age Group/ years | □ 15-24 | □□ | 76 | 86.4% | 12 | 13.6% |
| | □ 25-34 | □□□ | 78 | 73.6% | 28 | 26.4% |
| P = 0.009 * | □ 35-44 | □□ | 62 | 79.5% | 16 | 20.5% |
| | □ 45-49 | □□ | 16 | 57.1% | 12 | 42.9% |
| Residence Area | □ Urban | □□□ | 152 | 76.0% | 48 | 24.0% |
| P = 0.551 | □ Rural | □□ | 40 | 76.9% | 12 | 23.1% |
| | □ Slum | □□ | 40 | 83.3% | 8 | 16.7% |
| Marital Status | □ Single | □□ | 34 | 94.4% | 2 | 5.6% |
| P < 0.001 | □ Married | □□□ | 198 | 76.2% | 62 | 23.8% |
| | □ Divorced | □ | 0 | 0.0% | 4 | 100.0% |
| Education in years | □□□ < 6 years | □□ | 32 | 72.7% | 12 | 27.3% |
| | □□□□ 6-9 years | □□□ | 103 | 79.8% | 26 | 20.2% |
| P = 0.782 | □□□ 9-12 years | □□ | 57 | 76.0% | 18 | 24.0% |
| | □□□□ > 12 years | □□ | 40 | 76.9% | 12 | 23.1% |
| Employment | □ Employed | □□ | 31 | 77.5% | 9 | 22.5% |
| P = 0.676* | □ Housewife | □□□ | 201 | 77.9% | 57 | 22.1% |
| | □ Free work | □ | 0 | 0.0% | 2 | 100% |
| Economic Level | □ Good | □□ | 18 | 81.8% | 4 | 18.2% |
| P = 0.126 | □ Middle | □□□ | 132 | 73.3% | 48 | 26.7% |
| | □ Low | □□ | 82 | 83.7% | 16 | 16.3% |

*Chi square test was used.

Discussion

Hand eczema is highly prevalent disease among child bearing age women in Karbala city (77.3%), this result was higher than the result reported by other study in Diyala (Baquba), (62.3%) ^[21], and higher than the result reported by study in Saudi Arabia (45.5%) ^[22], Turkey (52%) ^[23], India (62%) ^[24]. However, differences in above results of above mentioned studies could be related to sampling methods used, type of work done by our patients and to the characteristic of area and women included in these studies.

Hand eczema has significant association with young age group (15-24) years this result goes with other results which reported association with young age ^[21,25,26]. Possibly because that young age are involved in occupational activities with consequent more contact with irritants in addition to exposure to the trauma of rubbing and scrubbing during domestic work. Similar explanation could explain the significant higher HE rate among non-married women, or it could be related to their relative younger age rather than being single.

The palm was the most affected site with majority involvement of both hands. This probably because the palm is the wider area of the hand in contact with irritants this result agree with other studies, but with higher percentages in current study ^[21,25,26].

Roughness and scaly patches were the most frequently recorded signs (95.7%). This is in line with other studies in Baquba (45.2%) ^[21], Denmark (52.3%) ^[27]. Roughness is the most common presentation of HE and the higher percentage in current this could be due to that roughness is the early presentation in all cases of HE ^[9,14].

The most common aggravating factors of HE were soap and detergents this result agree with other results of other study in Brazil ^[25], India ^[26]. This problem is increasing as many chemicals, such as odors and antibacterial, are found in new types of soaps and detergents on the market. Moreover, with the weak quality control measures in Iraq.

Only little percentage of sampled women were using protective gloves in their domestic work (9.3%), this result is in line with other result in Baquba where (9.1%) of sampled women use protective gloves ^[21]. This could be due to low awareness about the preventive measures.

The impact of HE is reflected on different aspects of the life include psychological, daily work and economic status. The psychological impact of hand eczema in our study was (71.6%) which include embarrassment, anxiety, depression, low self-esteem due to disfigurement of hands this result goes with results of other study in Italy (55.8%) [28], India (62.5%) [29], though the higher percentage in our study.

Conclusion

Hand eczema is a common condition among childbearing aged women in Karbala and involving both hands among majority and the palm was the most affected site. Hand eczema was associated with younger age group and being single. Roughness was the most clinical presentation and the most frequent triggering factors of HE were soap and detergent. The use of protective gloves was very limited among sampled women. And the most frequent impact was the psychological (embarrassment, low self-esteem). Educational programs about the diagnosis, education and prevention of hand eczema at the PHC level is recommended as minority of women had been counselled or educated about the issue, and very little use protective methods.

Dedication: To the soul of the late Dr. Fatima Al-Hasany (the third researcher) who was martyred due to Corona Covid-19 infection in March 2021

References

1. Crane MM, Webb DJ, Watson E, Cunliffe T, English J. Hand eczema and steroid-refractory chronic hand eczema in general practice: prevalence and initial treatment. *British Journal of Dermatology*. 2017 Apr;176(4):955-64.
2. Ingram JR, Eczematous disorder at Christopher E. M., Barker J, Bleiker T, Chalmes R, Creamer D, (Rooks Textbook of Dermatology), ninth edition, 2016 Willy Blackwell, p.39.1.
3. Quaade AS, Simonsen AB, Halling AS, Thyssen JP, Johansen JD. Prevalence, incidence, and severity of hand eczema in the general population—A systematic review and meta-analysis. *Contact Dermatitis*. 2021 Jun;84(6):361-74.
4. Mahajan BB, Kaur S. Impact of hand eczema severity on quality of life: A hospital based cross-sectional study. *Our Dermatol Online*. 2016;7:1–4.
5. Olesen CM, Agner T, Ebbelhøj NE, Carøe TK. Factors influencing prognosis for occupational hand eczema: new trends. *British Journal of Dermatology*. 2019 Dec;181(6):1280-6.
6. Brans R, Hübner A, Gediga G, John SM. Prevalence of foot eczema and associated occupational and non-occupational factors in patients with hand eczema. *Contact Dermatitis*. 2015;73:100–7.
7. Jungbauer FH. Houseworkers. In John SM, Johansen JD, Rustemeyer T, Elsner P, Maibach H Kanerva's Occupational Dermatology. Springer International Publishing 2020:2075-8.
8. Visser MJ, Verberk MM, Campbell LE, McLean WH, Calkoen F, Bakker JG, et al. Filaggrin loss-of-function mutations and atopic dermatitis as risk factors for hand eczema in apprentice nurses: part II of a prospective cohort study. *Contact Dermatitis*. 2014 Mar 1;70(3):139-50.
9. Agner T, Elsner P. Hand eczema: epidemiology, prognosis and prevention. *Journal of the European Academy of Dermatology and Venereology*. 2020 Jan;34:4-12.
10. Sørensen JA, Fisker MH, Agner T, Clemmensen KK, Ebbelhøj NE. Associations between lifestyle factors and hand eczema severity: are tobacco smoking, obesity and stress significantly linked to eczema severity?. *Contact Dermatitis*. 2017 Mar;76(3):138-45.

11. Brans R, Skudlik C, Weisshaar E et al. Association between tobacco smoking and prognosis of occupational hand eczema: a prospective cohort study. *Br J Dermatol* 2014; 171: 1108–1115.
12. Anveden Berglind I, Alderling M, Meding B. Life-style factors and hand eczema. *Br J Dermatol* 2011; 165: 568–575.
13. Diepgen TL, Andersen KE, Chosidow O, et al. Guidelines for diagnosis, prevention and treatment of hand eczema. *J German Soc Dermatol* 2014;e1–e22.
14. Zirwas MJ, Dupilumab for Hand Eczema, *Journal of the American Academy of Dermatology* (2018), doi: 10.1016/j.jaad.2018.02.073.
15. Mernelius S, Carlsson E, Henricson J, Lofgren S, Lindgren PE, Ehricht R, et al. *Staphylococcus aureus* colonization related to severity of hand eczema. *Eur J Clin Microbiol Infect Dis* 2016; 35: 1355–1361.
16. Carøe TK, Ebbelhøj NE, Bonde JP, Vejlstrup SG, Agner T. Job change facilitates healing in a cohort of patients with occupational hand eczema. *British Journal of Dermatology*. 2018 Jul;179(1):80-7.
17. Hamnerius N, Svedman C, Bergendorff O, Björk J, Bruze M, Pontén A. Wet work exposure and hand eczema among healthcare workers: a cross-sectional study. *British Journal of Dermatology*. 2018 Feb;178(2):452-61.
18. Wulfhorst, B., Strunk, M., Skudlik, C., Heichel, T., Sonsmann, F., Wilke, A., ... John, S. M. (2020). Rehabilitation and Prevention of Hand Eczema. *Contact Dermatitis*, 1–48. doi:10.1007/978-3-319-72451-5_71-1
19. Salvador JS, Mendaza FH, Garcés MH, Palacios-Martínez D, Camacho RS, Sanz RS, González AA, Giménez-Arnau AM. Guidelines for the diagnosis, treatment, and prevention of hand eczema. *Actas Dermo-Sifiliográficas (English Edition)*. 2020 Jan 1;111(1):26-40.
20. Barrett A, Hahn-Pedersen J, Kragh N, Evans E, Gnanasakthy A. Patient-reported outcome measures in atopic dermatitis and chronic hand eczema in adults. *The Patient-Patient-Centered Outcomes Research*. 2019 Oct;12(5):445-59.
21. Al-Azzawi SA. Occupational Hand Eczema among Housewives Attending Baquba Teaching Hospital. *Diyala Journal of Medicine*. 2013;5(1):57-62..
22. Al Shobaili HA. The pattern of skin diseases in the Qassim region of Saudi Arabia: What the primary care physician should know. *Annals of Saudi medicine*. 2010 Nov;30(6):448-53.

23. Gündüz Ö, Aytekin A, Tutkun E, Yılmaz H. Comparison of European standard patch test results of 330 patients from an occupational diseases hospital. *Dermatology research and practice*. 2016 Oct 11;2016.
24. Handa S, Kaur I. Hand eczema: Correlation of morphologic patterns, atopy, contact sensitization and disease severity. *Indian J Dermatol Venereol Leprol* 2012;78:153-8.
25. Nichol K, Copes R, Spielmann S, Kersey K, Eriksson J, Holness DL. Workplace screening for hand dermatitis: a pilot study. *Occupational Medicine*. 2016 Jan 1;66(1):46-9.
26. Raghu MT, Karinagannanavar A, Parvathi CN. A study of clinical types of contact allergic dermatitis of hands and its association with allergens. *Int J Appl Res*. 2015;1:643-50.
27. Lerbaek A, Kyvik KO, Ravn H, Menné T, Agner T. Clinical characteristics and consequences of hand eczema—an 8-year follow-up study of a population-based twin cohort. *Contact dermatitis*. 2008 Apr;58(4):210-6.
28. Cortesi PA, Scalone L, Belisari A, Bonamonte D, Cannavò SP, Cristaudo A, De Pità O, Gallo R, Giannetti A, Gola M, Pigatto PD. Cost and quality of life in patients with severe chronic hand eczema refractory to standard therapy with topical potent corticosteroids. *Contact Dermatitis*. 2014 Mar;70(3):158-68.
29. Bhatia R, Sharma VK, Ramam M, Sethuraman G, Yadav CP. Clinical profile and quality of life of patients with occupational contact dermatitis from New Delhi, India. *Contact dermatitis*. 2015 Sep;73(3):172-81.