Research Article **ISSN: 2581-8015**

International Journal of Nursing and Healthcare Research

Journal home page: www.ijnhr.com

https://doi.org/10.36673/IJNHR.2024.v08.i01.A04

A CROSS-SECTIONAL STUDY ON DERMATOSES IN NURSING STAFF AT A TERTIARY CARE TEACHING HOSPITAL

Abigail Syiemlieh[1] and Chitra S. Nayak*[1]

[1*]Department of Skin and V.D, OPD 14 (37), Topiwala National Medical College and BYL Nair Charitable Hospital, Dr. A L Nair Road, Mumbai Central, Maharashtra, India.

ABSTRACT

Nurses are at the highest risk of developing occupational dermatoses among health workers (HCWs) owing to their risk of exposure to chemicals, infectious material, wet work and prolonged standing. Previous studies conducted so far among HCWs have concentrated only on occupational dermatoses, particularly on contact dermatitis. This study unravels other occupational and non-occupational dermatoses among the nurses. **Aims and objectives:** The aim of the study is to determine the various dermatoses and their prevalence among staff nurses, along with their risk factors. **Settings and Design:** A cross-sectional observational study was conducted over 18 months, after taking approval from the institutional ethics committee. **Methods and Material:** Out of a total of 725 nurses at the hospital, 697 staff nurses were examined and 250 were found to have dermatoses and included in the study. **Results:** Non-occupational dermatoses (37%) were more common than occupational (21.8%). Surprisingly, against previously reported, "maskne" (43.9%) was the most common of occupational dermatoses followed by hand eczema (30.3%) of which Irritant Contact Dermatitis was more common than Allergic Contact Dermatitis. Eczema was also found to be strongly associated with the duration of wet work and soap and water exposure. Melasma (22.3%) was the most common among non-occupational dermatoses. Additionally, we detected telangiectasias and reticular veins with high prevalence among nurses (20% of overlap dermatoses) along with callosities and corn (13.6% of overlap dermatoses), which are more likely occupationally-related than not at all and thus should be considered as occupational risks in nurses. **Conclusion:** The description and detection of not only occupational, but also non-occupational dermatoses can help educate nurses on the prevalence and risk factors of the various dermatoses among the group and encourage practicing preventive strategies.

KEYWORDS

Occupational dermatoses, Non-occupational dermatoses, Maskne, Hand eczema, Contact dermatitis and COVID-19

Author for Correspondence:
Chitra S. Nayak,
Department of Skin and V.D, OPD 14 (37),
Topiwala National Medical College and BYL Nair Charitable Hospital, Mumbai, Maharashtra, India.
Email: chitra212@hotmail.com

INTRODUCTION

Skin conditions among nurses are common and are either directly or indirectly related to their occupation, thus important to study the risk factors attributable. Research has shown that the most common occupational disorders are musculoskeletal

disorders (57%), followed by skin diseases, ranging from 29% to 35%[1]. HCWs, especially nurses and hospital cleaning staff, largely women, bear the maximum burden of hand eczema due to frequent "wet work"[2]. Apart from occupational contact dermatitis, other occupational dermatoses are not commonly studied. Additionally, the COVID-19 pandemic has also contributed to an increasing burden of dermatoses in recent times. All the above factors led us to study dermatoses among nurses.

MATERIAL AND METHODS

A cross-sectional study was conducted at a tertiary care hospital on 697 of the total 725 nurses in the hospital after approval from the institutional ethics committee. The data was analysed using SPSS (Statistical Package for Social Science) Version 10.0 software and used Chi-square tests to analyse associations between the dermatoses and their risk factors. The aim was to estimate the prevalence of different dermatoses, their types and determination of their risk factors.

RESULTS AND DISCUSSION

Out of the 697 nurses examined, 250 had dermatoses, amounting to a prevalence of 35.87%. A majority (34.0%) of the dermatoses were seen among 40-<50 years, while the least number of complaints were seen in 50-60 years (18.0%). 99.2% of the staff nurses included were female, which was expected since out of 725 nurses only four were males.

A majority (62.8%) of the nurses were working in the general wards, followed by 11.6% who were in the covid wards, 10% in the general out-patient departments (OPDs), and then the least were seen in the Intensive Care Units (ICU) (9.6%).

We have broadly classified the dermatoses into occupational, non-occupational and overlap, with their prevalence depicted in Figure No.1.

The occupational dermatoses alone were much less common than the non-occupational dermatoses, but the majority (41.2%) were the "overlap dermatoses" which include dermatoses that can be caused by either or both occupational and non-occupational reasons and are detailed below. The prevalence of each of the occupational dermatoses is given in Table No.1.

The most common occupational dermatosis was maskne, followed by hand eczema at 30.3% (20 cases of 66 occupational dermatoses); which included Irritant Contact Dermatitis (ICD) forming 50% of occupational hand eczema (ten of 20 cases), 35% hand eczema was Allergic Contact Dermatitis (ACD) (seven of 20) and 15% were chronic hand eczema (three of 20 cases).

There were 112 non-occupational dermatoses (37%), each of which are mentioned in Table No.2. The most common non-occupational dermatosis was melasma (22.3% of non-occupational dermatoses), followed by cutaneous manifestations of endocrine disorders (14.3% dermatoses) which affected 6.4% of nurses. The endocrine disorders found include acrochordons (4% nurses), acanthosis nigricans (1.2%), xanthelasma palpebrarum, acne vulgaris due to PCOS and striae distensae from weight gain (0.4% each).

The various dermatoses under the "overlap" category are given in Table No.3, of which infections were the most common (41.6% dermatoses). Among the "Overlap" dermatoses, 21.2% of nurses had infections. A majority of the nurses had pityriasis sicca (6.0% nurses), dermatophytosis (5.6%) and 3.2% had warts [verruca vulgaris (2.4%), then verruca plana (0.8%)]. Others were onychomycosis (1.6%), paronychia, pityriasis versicolor (1.2% each); candida intertrigo and seborrheic dermatitis (0.8% each); scabies and erythrasma (0.4% each).

In addition to the above categories, we further studied common dermatoses such as acne vulgaris, eczema, venous disorders, cutaneous disorders due to mechanical factors and covid PPE; for risk factors and are detailed below.

Acne vulgaris, both occupational and non-occupational, were seen in 17.6% nurses; a majority (11.6% nurses) had occupational acne (maskne)**.** Ninety-one of 250 (36.4%) nurses had sleep disturbance, and 31 of the 91 (34%) nurses had acne vulgaris. Thus, mask use and sleep deprivation were risk factors for acne in nurses.

We found that 17.2% (43 of 250) of the staff nurses had eczema, which include both occupational and

non-occupational eczema irrespective of site of involvement, out of whom 15 of 43 had ICD and 13 of 43 had ACD and chronic dermatitis each, while two had stasis dermatitis (shown in Figure No.2). Of the occupational hand eczema, 50% were ICD and 35% were ACD. There is a significant association between eczema and duration of wet work. Nurses who restricted wet work to less than one hour/day had the least risk for eczema (1.9% nurses) compared to nurses who engaged in wet work more than two hours/day (Table No. 4). Table No. 5 shows that the risk of eczema is more with using soap and water for hand washing (12.7%) as against the use Alcohol based hand-rubs (ABHRs) (4.7% had eczema),with significant association.

Vascular disorders were also common with the majority being telangiectasias (Figure No.3).

The other common dermatoses were due to mechanical factors like prolonged walking and friction with footwear seen in 10.8% of the nurses. 6.8% of nurses had callosities and hard corns. The others are shown in Figure No.4.

Covid PPE (Personal Protective Equipment)-related dermatoses affected 53 of 250 (21.2%) of nurses with the most common being maskne (11.6% nurses) and the others enlisted in Figure No.5.

Discussion

We found that the prevalence of dermatoses in nursing staff was 35.87% and that nurses in general wards had a higher percentage of dermatoses (62.8%), which was not in congruence with a study where ICU work was associated with more occupational dermatoses probably because we included all dermatoses[3].

Among occupational dermatoses, "maskne" was found to be more common than hand eczema in our study. Most likely, this change in trend is due to the covid-19 mandated use of masks. Hand eczema was reported with a prevalence of 46-50% previously[4], against 30.3% noted by our study.

More than half of the acne vulgaris patients were maskne. In a recent study on HCWs, the prevalence of acne vulgaris was 53% out of which 44.7% had maskne[6]. The higher prevalence, in comparison to our study, is most likely due to the inclusion of all HCWs in their study. "Maskne" is a term used to refer to new onset acne vulgaris or those that have exacerbated with mask usage for more than six hours, precipitated due to friction and occlusion[7]. In our institute as well, with the prolonged usage of the N95 mask in the current COVID-19 scenario, acne is now the major dermatoses. More senior nurses relieved off covid duty and using the N95 masks only intermittently did not report any acne.

Other than mask use, sleep was a risk factor for maskne. Sleep disturbance was seen in 36.4% of the nurses in our study. It disrupts the circadian rhythm and wreaks havoc in metabolic functions, making them more prone to obesity, diabetes and cardiovascular diseases[8]. Inflammatory cytokines have also been seen to be persistently raised causing a chronic inflammatory state aggravating diseases such as acne vulgaris, psoriasis and atopic dermatitis.[9]

The second most common dermatosis was hand eczema, which is especially common in HCWs because of the repeated exposure to irritants. In many studies, hand dermatitis was seen majorly among nurses of all HCWs, predominantly in females (87%)[10]. ACD was diagnosed based on the history, examination as described previously[11] and in Table No.6 and signs of atopic tendency with a family history. A study found that 70-80% were occupational ICD of the hands, while 49 % were ACD which are both comparable with our study[12]. The usual irritants among HCWs include chemicals in disinfectants, medications and cleansers; while allergens include latex proteins, rubber glove chemicals such as thiuram mix; and preservatives such as formaldehyde, and isothiazolinones[13]. The overall prevalence of natural rubber latex allergy has been estimated to be up to 36%[14]. The lack of exposure to these occupational agents causes relief when off-duty and studies found the same in 64% nurses[15] and similar we found that 62.8% of nurses report relief when they are off duty. It was also demonstrated by us that engaging in wet work < two hours a day greatly reduces the risk of eczema and that soap and water have more potential in causing eczema than ABHRs comparable to a German study that also showed that wet work > two hours/days can precipitate and aggravate eczema[16]. Wet work has

been described as work that involves prolonged contact with water, either directly or prolonged glove use especially for more than ten minutes[17,4]. Hence the risk factors for hand eczema that we found is the duration of wet work and frequent exposure to soap and water.

Venous disorders were included in 'overlap disorders' since they could be affected either way and form 20% of the overlap dermatoses affecting 10% of nurses, more than the 5% prevalence in the Indian general population[18]. A majority (4.8% of the nurses) had telangiectasias which were also seen by one study group[19]. Risk factors include obesity, prolonged standing, especially for more than four hours and increasing age[20], which, with adequate education can reduce the incidences of the same.

Callosities and corn were the most common (6.8%) among mechanical disorders, as also stated in a study on foot problems in nurses which suggests that callosities and venous disorders may be considered as occupational dermatoses among nurses[21]. Prolonged standing, walking and wearing of ill-fitted footwear are known risk factors.

Covid work/ PPE related dermatoses: The surgical mask was the commonest PPE that was associated with dermatoses[22]. While friction dermatitis due to mask use was the most common finding in one study; another showed that contact dermatitis was the most common dermatoses followed by maskne [23,24]. Wearing masks continuously for more than six hours are seen as risk factors.

Some recommendations that can be followed to help reduce hand eczema are:[25,26]

1. Using protective gloves in wet work
2. If gloves are to be worn for longer than 10 mins, wear cotton gloves underneath
3. Frequent use of lipid-rich, low fragrance moisturisers with preservatives having the least allergenic potential
4. Use of ABHRS when the hands are not visibly dirty, instead of soap and water.

Providing powder free gloves, ABHRs and intermittent mask use by reducing continuous working hours can prevent skin-related diseases among HCWS. There is evidence that relieving work stresses and education can help reduce dermatoses among nurses[27].

Table No.1: Percentage of various occupational dermatoses

S.No	Occupational Dermatoses	Number of dermatoses	Percentage
1	"Maskne"	29	43.9%
2	Hand eczema- Irritant Contact Dermatitis (ICD)	10	15.2%
3	Telogen effluvium (TE) after Covid-19 work	8	12.1%
4	Frictional Dermatitis (Mechanical)	7	10.6%
5	Hand eczema- Allergic Contact Dermatitis (ACD)	7	10.6%
6	Chronic hand eczema	3	4.5%
7	Post-inflammatory hyperpigmentation after maskne	1	1.5%
8	Onychomycosis with paronychia	1	1.5%
9	Total	66	

Table No.2: Profile of various non-occupational dermatoses

S.No	Non-Occupational Dermatoses	Number of dermatoses	Percentage
1	Melasma	25	22.3%
2	Cutaneous manifestations of endocrine disorders	16	14.3%
3	Auto-immune disorders	16	14.3%
4	Telogen effluvium (illness related)	10	8.9%
5	Hair-fall due to non-specific causes	7	6.2%
6	Post-inflammatory hyperpigmentation (PIH)	6	5.3%
7	ACD due to other non-occupational reasons	6	5.3%
8	ICD due to other non-occupational reasons	5	4.5%
9	Peri-orbital Hypermelanosis	5	4.5%
10	Female Pattern Hair Loss (FPHL)	4	3.6%
11	Lichen Simplex Chronicus	3	2.7%
12	Tanning	3	2.7%
13	Macular amyloidosis	3	2.7%
14	Generalised xerosis	2	1.8%
15	Keratosis pilaris	1	0.9%
16	Total	112	

Table No.3: Profile of the different "overlap dermatoses"

S.No	Overlapping dermatoses	Number of dermatoses	Percentage
1	Infections	52	41.6%
2	Venous disorders	25	20%
3	Callosities and hard corn	17	13.6%
4	Acne vulgaris (not of new onset or aggravated with mask use)	15	12%
5	Chronic eczema other than hand eczema	10	8%
6	Traction alopecia	3	2.4%
7	Stasis dermatitis	2	1.6%
8	Miliaria rubra	1	0.8%
9	Total	125	

Table No.4: Association between duration of wet work and hand eczema

S.No	Duration/day	No. of Cases	Cases with Hand Eczema	
			No	%
1	<1 hour	052	01	1.9
2	1-<2 hours	163	10	6.13
3	2-3 hours	035	09	25.71
4	-	-	*P*= 0.000938, *Significant	

Table No.5: Association between hygiene preferences and hand eczema

S.No	Hygiene Preferences	No. of Cases	Cases with Hand Eczema	
			No.	%
1	Soap and water (Soap+water)	102	13*	12.7
2	Alcohol based handrubs (ABHRs)	148	07	04.7
3	-	-	*P*= 0.0352, *Significant	

Table No.6: Distinguishing features between ICD and ACD[11]

S.No	Feature	ICD	ACD
1	Population affected	Anybody	Predisposed population only
2	Pathogenesis	Direct cytotoxicity	Type IV hypersensitivity
3	Onset	Immediate	12-48 hours
4	Symptoms	Pain or burning more	Itching more
5	Signs	Subacute or chronic eczema with fissures	Acute to subacute eczema with vesicles
6	Concentration of the contactant	High	Low
7	Confirmatory Tests	None	Patch or prick tests

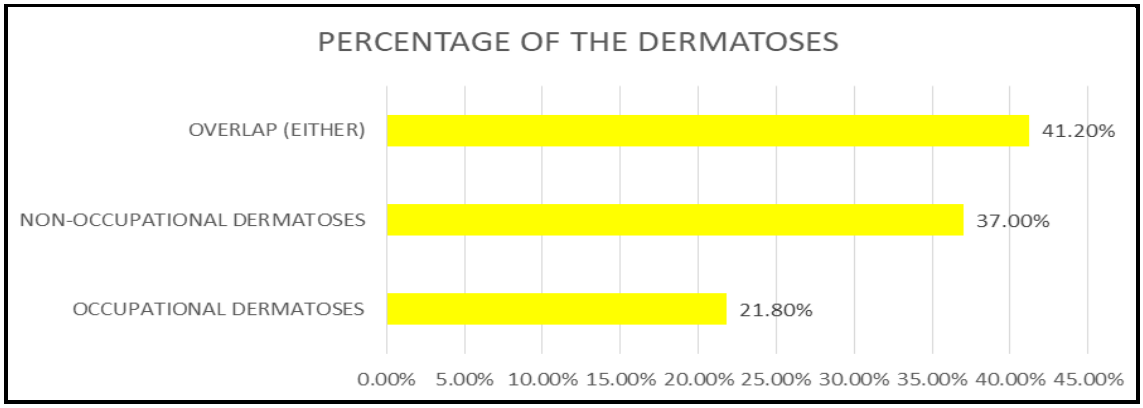

Figure No.1: A bar diagram showing a broad classification of the dermatoses among nurses

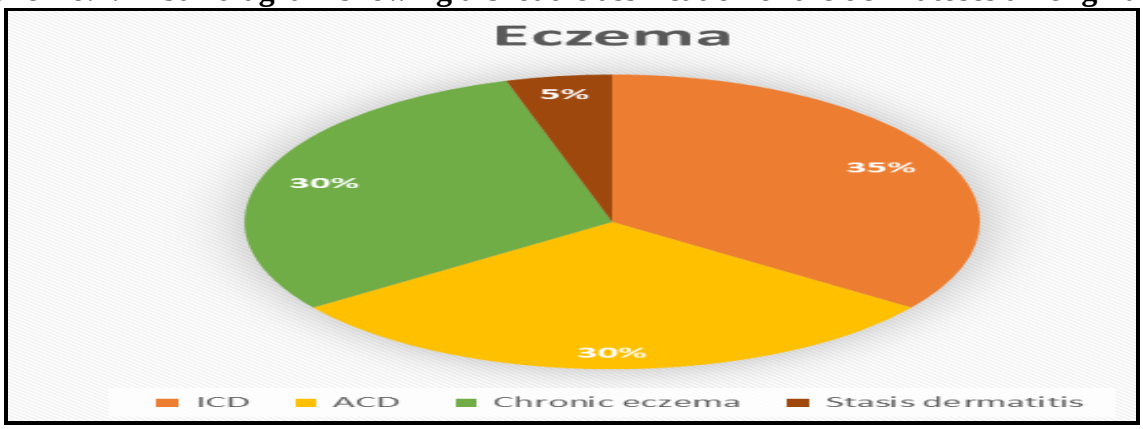

Figure No.2: The profile of all eczema (both occupational and non-occupational) is explained in the pie-chart

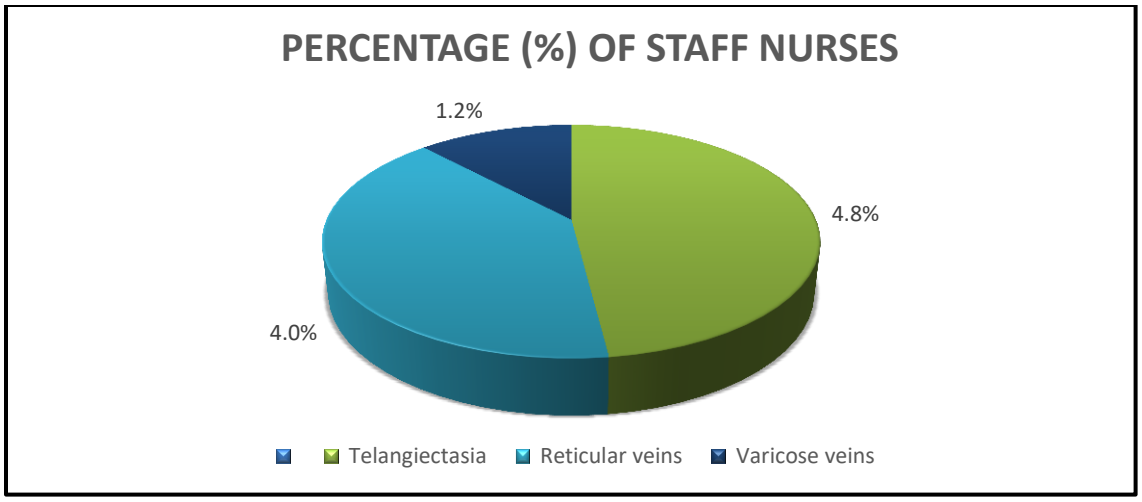

Figure No.3: Percentage of the different types of venous disorders

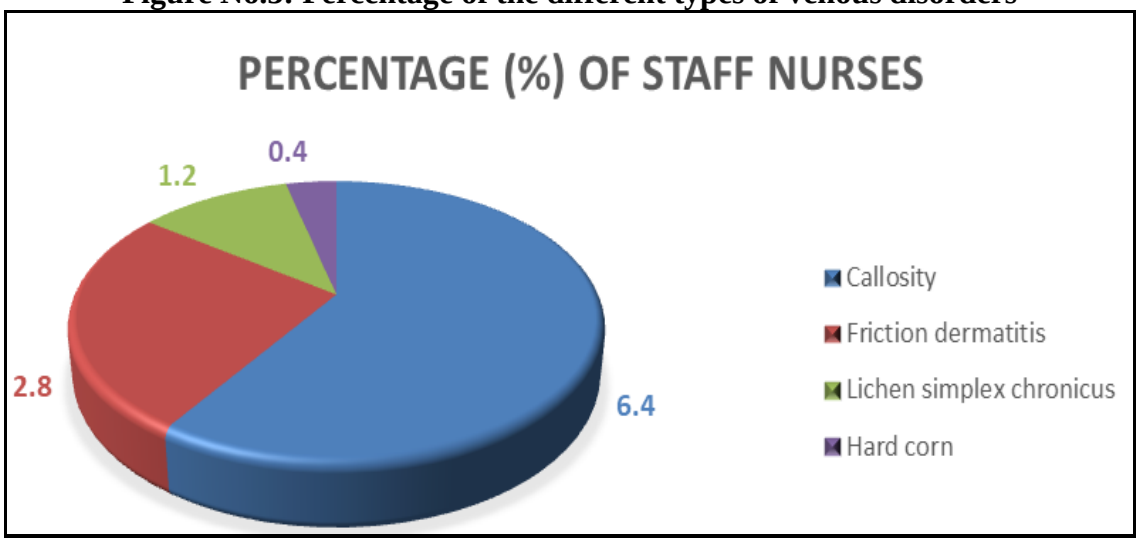

Figure No.4: This pie chart shows the common skin disorders caused by mechanical factors

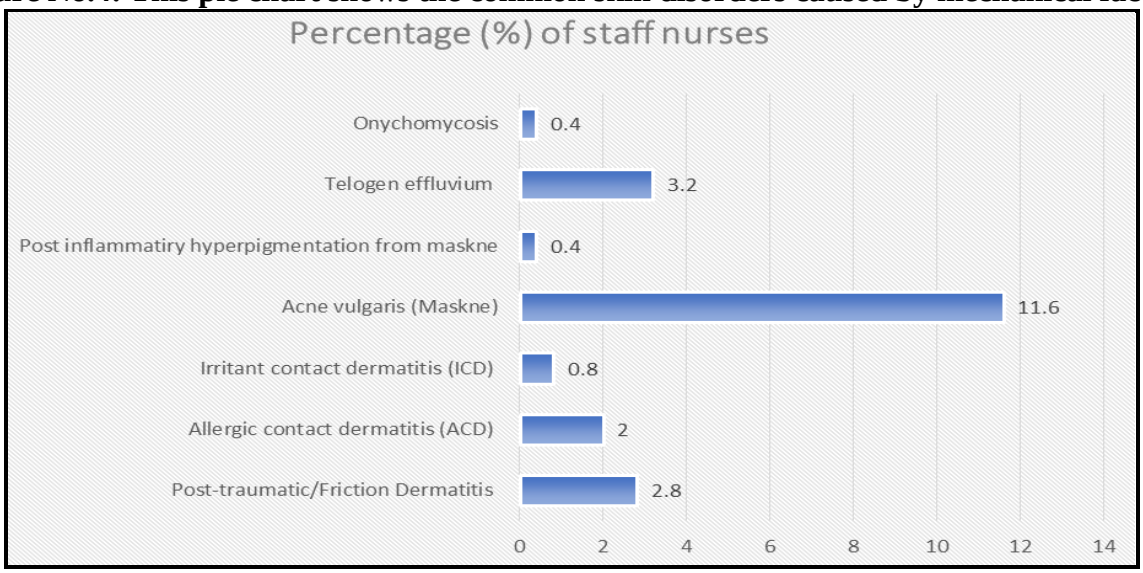

Figure No.5: A bar diagram of the dermatoses associated with covid-19 work and PPE use

CONCLUSION

Maskne which is due to prolonged mask use, seems to have replaced eczema as the most common occupational dermatoses. Eczema is strongly associated with the duration of wet work and soap and water exposure. Venous disorders and callosities should be considered occupational dermatoses owing to their high prevalence among nurses. Knowledge of these dermatoses can help spread more awareness and advocate preventive strategies.

LIMITATIONS

Since this was a cross-sectional study, we could only assess and include dermatoses presenting during the study. Also, as the study included multiple dermatoses, the sample size for each was small and thus the definitive prevalence cannot be estimated. Due to the busy schedule of the nurses, only three followed up for patch testing and all were negative.

ACKNOWLEDGEMENT

The authors wish to express their sincere gratitude to Department of Skin and V.D, OPD 14(37), Topiwala National Medical College and BYL Nair Charitable Hospital, Dr. A L Nair Road, Mumbai Central, Maharashtra, India for providing the necessary facilities to carry out this research work.

BIBLIOGRAPHY

1. Salako K B, Chowdhury M M U. Occupational skin disorders, *La Dou J, Harrison R J, Eds, Occupational and Environmental Medicine, McGraw-Hill, New York,* 2014, 324-345.
2. Cheng-Che E Lan, Ching-Shuang Wu, Ying-Chin Ko, Hsin-Su Yu *et al*. Hand dermatitis among university hospital nursing staff with or without atopic eczema: Assessment of risk factors, *CD,* 64(2), 2011, 73-79.
3. Jungbauer F H W, Van Der Harst J J, Groothoff J W, Coenraads P J. Skin protection in nursing work: promoting the use of gloves and hand alcohol, *Contact Dermatitis,* 51(3), 2004, 135-140.
4. Szepietowski J, Salomon J. Hand dermatitis: A problem commonly affecting nurses, *Rocz Akad Med Bialymst,* 50(1), 2005, 46-48.
5. Dana A S, Rex I H, Samitz M H. The Hunting reaction, *Arch Dermatol,* 99(4), 1969, 441-450. Adams R M, Allergy C D. General principles and causes, *In: Adams RM, editor. Occupational Skin Disease, Saunders, Philadelphia,* 2nd Edition, 1990, 26-31. 69.
6. Yaqoob S, Saleem A, Asif A, Essar M Y, Emad S. Association of acne with face mask in healthcare workers amidst the COVID-19 outbreak in Karachi, Pakistan, *Clin Cosmet Investig Dermatol,* 14, 202, 1427-1433.
7. Damiani G, Gironi L C, Grada A, Kridin K, Finelli R, Buja A *et al*. COVID-19 related masks increase severity of both acne (maskne) and rosacea (mask rosacea): Multi-center, real-life, telemedical and observational prospective study, *Dermatol Ther,* 34(2), 2021, e14848.
8. Biggi N, Sogliani M, Costa G. Metabolic syndrome in permanent night workers, *Chronobiol Int,* 25(2), 2008, 443-454.
9. Lu F, Suggs A, Ya J, Fu P, Jamora J, *et al*. The effect of shift work and poor sleep on self-reported skin conditions: A survey of call center agents in the Philippines, *Clocks and Sleep,* 1(2), 2019, 273-279.
10. Statescu, Laura *et al*. "CD - epidemiological study" *Maedica,* 6(4), 2011, 277-281.
11. Sasseville D. Occupational contact dermatitis, *All Asth Clin Immun,* 4(2), 2008, 59-65.
12. Patel V, Atwater A R, Reeder M. CD of the hands: Is it irritant or allergic? *Cutis,* 107(3), 2021, 129-132.
13. Higgins C L, Nixon R L. Occupational skin disease among Australian healthcare workers: A retrospective analysis from an occupational dermatology clinic, 1993-2014, *Contact Dermatitis,* 75(4), 2016, 213-222.
14. Charous B L, Blanco C, Tarlo S, Hamilton R G, Baur X, Beezhold D, *et al*. Natural rubber latex allergy after 12 years: Recommendations and perspectives, *J Allergy Clin Immunol,* 109(1), 2002, 31-34.
15. Jain A, Mendiratta V. Contact dermatitis in nurses and paramedics in a tertiary care hospital of northern India, *Indian J Dermatol Venereol Leprol,* 76(5), 2010, 566-567.

16. Fartasch M. Hautschutz. Von der TRGS 401 biszur Leitlinie "berufliche hautmittel" [Skin protection, From TRGS 401 to guidelines on "occupational skin protection products"], *Hautarzt*, 60(9), 2009, 702-707.
17. Sussman G L, Deal K, Brown S, Cividino M, Siu S, *et al*. Incidence of latex sensitization among latex glove users, *J Allergy Clin Immunol*, 101(2Pt1), 1998, 171-178.
18. Scurr J H, Venous disorders, In: Russel R C, Bailey H, Love Mc N, editors, Bailey and love's short practice of surgery, *Boca Raton, FL: CRC Press*, 23, 2000, 235-255.
19. Nasiri-Foourg A, Kazemi T, Nakhaii N, Kazemi N. Lower limb varicose veins and their relationship with risk factors in nurses of the Birjand University of Medical Sciences Hospital, *Journal of Birjand University of Medical Sciences (JBUMS)*, 12, 2005, 9-15.
20. Abou-ElWafa H S. Lower limb varicose veins among nurses: A single center cross-sectional study in mansoura, *Egypt. Indian J Occup Environ Med*, 24(3), 2020, 172-177.
21. Reed L F, Young J, Newman B. Prevalence and risk factors for foot and ankle musculoskeletal disorders experienced by nurses, *BMC Musculoskelet Disord*, 15(1), 2014, 196.
22. Yu J, Chen J K, Mowad C M, Reeder M, Hylwa S, Chisolm S, *et al*. Occupational dermatitis to facial personal protective equipment in health care workers: A systematic review, *J Am Acad Dermatol*, 84(2), 2021, 486-494.
23. Lan J, Song Z, Miao X. Skin damage among health care workers managing coronavirus disease-2019, *J Am Acad Dermatol*, 82(5), 2020, 1215-1216.
24. Choi S Y, Lee G Y, Cheong S H, Jung H J *et al*. Mask-induced dermatoses during the COVID-19 pandemic: A questionnaire-based study in 12 Korean hospitals, *Clin Exp Dermatol*, 46(8), 2021, 1504-1510.
25. Held E, Wolff C, Agner T. Prevention of work-related skin problems in student auxiliary nurses: An intervention study, *Contact Dermatitis*, 44(5), 2001, 297-303.
26. Boyce J M, Pittet D. Recommendations of the healthcare infection control practices advisory committee and the HICPAC/SHEA/APIC/IDSA hand hygiene task force, *Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America, MMWR Recomm Rep*, 51(RR-16), 2002, 1-45.
27. Magnavita N, Elovainio M, Heponiemi T, Magnavita A M, Bergamaschi A. Are skin disorders related to work strain in hospital workers? A cross-sectional study, *BMC Public Health*, 11, 2011, 600.

Please cite this article in press as: Abigail Syiemlieh and Chitra S. Nayak. A cross sectional study on dermatoses in nursing staff at a tertiary care teaching hospital, *International Journal of Nursing and Healthcare Research*, 8(1), 2024, 24-32.