

Dermatological conditions associated with dental professionals in Saudi Arabia

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ABSTRACT

Background: Dental professionals and students are commonly exposed to occupation-related skin lesions, characterized as contact dermatitis (like allergic and irritant contact dermatitis, contact urticaria), that are commonly observed on hands and fingers. The present study evaluated the prevalence of skin lesions, knowledge about risk factors, and prevention of dermatological lesions among dental students and dental professionals. **Methods:** The present observational study was carried out on 100 study subjects, including dental students and staff, using a self-administered and structured questionnaire to assess demographic variables, awareness information, and knowledge about work-related skin lesions. The data was subjected to statistical analysis using IBM's Statistical Package for the Social Sciences (SPSS) version 20. **Results:** Sixty percent of the total number of subjects were dental students and 40% were dentists. 56.8% of the subjects were female and 43.2% were male, with a maximum of 0–5 years of practice/experience. The most common symptoms of skin lesions were itching and erythema, especially on the hands and fingers. Only 15.6% had their treatment done by dermatologists, and 7% underwent skin prick tests. Latex allergy was most familiar with feature of facial edema. The use of hand sanitizers, soaps, and protective cream was limited among the subjects. **Conclusion:** There was a lack of awareness among both the dentists and students regarding work-related skin lesions and getting them treated by dermatologists at the earliest, though the dentists' level of knowledge was better than that of the students. Thus, various educational programs on dermatological lesions should be implemented so that dental professionals and students take necessary precautions and seek treatment for skin disorders.

Keywords: Dental professionals, dental students, dermatological lesions, Saudi Arabia, skin

Introduction

Occupation-related skin lesions constitute a significant risk in health care. Hand dermatitis is among the most common dermatological lesion reported in health care workers. Skudlik *et al.*^[1] reported that nurses are at highest risk of having hand

dermatitis among health care workers, with an estimated point prevalence of 18%–30%. Vodanovic *et al.*^[2] reported that among dental professionals (dentists, dental students, dental assistants, dental technicians), occupation-related skin lesions are the second most common disorder after musculoskeletal diseases.

Occupation-related skin lesions are characterized as contact dermatitis (like allergic and irritant contact dermatitis and contact urticaria). Contact of skin with allergens or irritants can cause allergic or non-allergic contact dermatitis. The most common occupational or environmental factors that cause skin lesions in dentistry are dental materials, gloves, and chemicals like solvents, lubricants, acids, etc.^[3]

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The most common skin lesions are observed on the face, hands, forearms, and neck. The lesions commonly recede but relapse again after new exposure. Among dermatological lesions, clinical features are papulovesicles, itching, fissuring, erythema, urticaria, hyperkeratosis, and lichenification.^[3] The lesions can be acute, subacute, or chronic. These presentations can be differentiated based on development over time, morphology, and time of exposure to the toxin. The classification of skin lesions is essential for the choice of therapy.

Dermatological lesions affect the quality of life, increase the cost of treatment to the individual and employer, and even lead to loss of employment or work capability. The affected dental professionals may also experience negative psychosocial impacts like interference with professional work, day-to-day activities, and disturbance of sleep.^[4]

For any dermatological lesions, dental professionals and dental students should consult a dermatologist to ensure proper diagnosis and treatment. Skin care should be done by using protective soaps, hand creams for sensitive skin, and by receiving appropriate skin therapy.^[5]

Although it is now a widely known fact that protective measures should be sufficiently taken during dental procedures to prevent work-related dermatological lesions, carelessness has still been reported among dental students and professionals. The dental material amalgam has been reported as quite dangerous as the mercury vapor from the amalgam can be absorbed through the skin and lungs^[6,7] Fasunloro and Owutade^[8] reported in their research that a majority of the dental staff who handled mercury were not aware of the risks of being exposed to mercurial poisoning during their work in dental settings.

Primary care physicians can play a vital role in raising awareness among dentists, dental assistants, dental students, and dental technicians regarding the various signs and symptoms of dermatological allergies related to dental procedures and materials, as well as preventive measures for the same at various health care facilities and colleges through health promotion and education programs.

The present study evaluated the prevalence of skin lesions, knowledge about risk factors, and prevention of dermatological lesions among dental students and dental professionals.

Materials and Method

The present study was carried out in the dental clinics of King Khalid University, College of Dentistry, Abha, Saudi Arabia from May 2021 to November 2021. It was a cross-sectional and analytical study that included dental interns, students, and staff, making a convenient sample of 500 subjects. Informed and written consent was obtained from all subjects prior to their enrolment in this study. The self-administered and structured questionnaire assessed the demographic variables,

awareness information, and knowledge about work-related skin lesions. The demographic data collected consisted of gender distribution, years of experience, and occupation details. The validity of the questionnaire was assessed and found to be appropriate ($\alpha = 0.85$). The data obtained were subjected to statistical analysis using IBM's Statistical Package for the Social Sciences (SPSS) version 20.0. Descriptive statistics, that is, frequencies and percentages, were computed. Comparative analysis was done using Chi-squared statistical analysis.

The study was conducted following the Declaration of Helsinki and was approved by the local ethics committee, Institutional Review Board (IRB/KKUCOD/ETH/2021-22/007). The subjects who suffered from any skin lesion were referred to a physician for further evaluation or treatment.

Results

Demographic data

One hundred participants were included in the study, with 60% being dental students and 40% being dentists. Fifty-six point eight percent of the subjects were female, and 43.2% were male. Thirty-eight percent had 0–5 years of experience in practice, followed by 37.4% with 6–10 years of experience, and 24.6% with more than 10 years of experience, and having a significant relation statistically ($P < 0.05$) Table 1 depicts the demographic data of the subjects.

Frequency distribution of responses of participants to the questionnaire

A majority (48.4%) of dental professionals worked for 7–8 hours per day, with a majority of the subjects (63.4%) working for 5–6 days in a week. Forty-seven point eight percent were found to have occupation-related skin lesions, with the most common feature being itching and erythema especially on the hands and fingers. Sixteen percent visited dermatologists for skin lesions, and most of them were diagnosed with eczema. Eighteen point eight percent faced the psychological impact of skin lesions. Only 15.6% had their treatment done by dermatologists, and 7% underwent skin prick tests. It was observed that 50% used latex gloves, out of which 6% were

Table 1: Demographic data of the study participants

	Frequency	Percentage	Chi-square test	P
Gender				
Female	284	56.8	9.998	0.87
Male	216	43.2		
Years of Experience				
0-5 years	190	38	12.718	0.054*
6-10 years	187	37.4		
>10 years	123	24.6		
Occupation				
Dental student	300	60	13.981	0.041*
Dentist	200	40		
Total	500	100.0		

* $P < 0.05$ is significant

Table 2: Frequency distribution of responses of participants to the questionnaire

Options	Frequency	Percentage	Chi-squared test	P
Q1. How many hours do you work per day?				
12 h or more	17	3.4	9.990	0.011*
6 h or less	188	37.6		
7-8 h	242	48.4		
9-11 h	53	10.6		
Q2. How many days do you work in a week?				
1-2 days	18	3.6	2.901	0.043*
3-4 days	165	33.0		
5-6 days	317	63.4		
Q3. Do you take any medications that may cause dry skin?				
I'm not sure	43	8.6	13.09	0.022*
No	399	79.8		
Yes	58	11.6		
Q4. Have you observed any work-related skin changes?				
No	261	52.2	12.771	0.065
Yes	239	47.8		
Q5. If yes, choose the symptoms and signs you've observed. (n=239)				
Dryness	128	23	11.122	0.032*
Erythema	110	18.2		
Vesicles	98	19.6		
Itching	109	17.4		
Rash	78	13.2		
Scaling	56	8.6		
Q6. Where have these changes appeared?				
Not applicable	261	52.2	8.871	0.022*
On hands and fingers only	183	36.6		
On other areas	56	11.2		
Q7. Have you visited a dermatologist for those skin-related changes?				
No	180	36	9.623	0.032*
Not applicable	240	48		
Yes	80	16		
Q8. If you had visited a dermatologist, what was your diagnosis? (n=80)				
Acne	3	0.6	1.88	0.022*
Skin dryness	2	0.4		
Contact urticaria	4	0.8		
Dryness	6	1.2		
Eczema (atopic dermatitis)	22	4.4		
Hair loss	5	1		
Fungal infection	10	2		
Irritant contact dermatitis	13	2.6		
Allergic contact dermatitis	15	3		
Q9. Have those work-related skin lesions had a bad psychological effect on you? (n=239)				
No	145	29	6.908	0.065
Yes	94	18.8		
Q10. Have you had these skin changes treated? (N=239)				
Yes, by a dermatologist	78	15.6	29.591	0.004*
Yes, by a general practitioner	16	3.2		
Yes, on my own	145	29		
Q11. Have you undergone allergy tests?				
Patch test	12	2.4	26.667	0.052*
Skin prick test	35	7.0		
Q12. Which type of gloves do you wear at work?				
I'm not sure	116	23.2	12.889	0.033*
Latex gloves	250	50.0		
Latex- free gloves	134	26.8		
Q13. Have you been diagnosed with latex allergy?				

Contd...

Table 2: Contd...

Options	Frequency	Percentage	Chi-squared test	P
No, but I have noticed a rash after using latex gloves	72	14.4	7.671	0.038*
No, I don't have latex allergy	318	63.6		
Not applicable	80	16.0		
Yes	30	6.0		
Q14. Which of the following have you experienced after using latex gloves? (n=390)				
Anaphylaxis (shock)	90	18	7.610	0.042*
Facial edema	97	19.4		
Itching	77	15.4		
Skin flushing	45	9		
Respiratory symptoms	36	7.2		
Runny nose	23	4.6		
Rash	22	4.4		
Q15. How often do you wash your hands after using latex gloves?				
Always	282	56.4	9.451	0.024*
Never	26	5.2		
Not applicable	46	9.2		
Often	146	29.2		
Q16. How often do you use a hand sanitizer?				
Not applicable	4	0.8	9.671	0.045*
Always	271	54.2		
Never	38	7.6		
Often	187	37.4		
Q17. If you have been diagnosed with latex allergy, has this been documented in your medical record?				
No	138	27.6	13.617	0.013*
Not applicable	321	64.2		
Yes	41	8.2		
Q18. Do you use soap for sensitive skin?				
No	334	66.8	11.561	0.021*
Sometimes	105	21.0		
Yes	61	12.2		
Q19. Do you use any hand protective cream?				
No	268	53.6	9.871	0.011*
Yes, 1-2 times a day	126	25.2		
Yes, after every hand wash	41	8.2		
Yes, several times a month	65	13.0		
Q20. Do you use a hand moisturizer?				
No	138	27.6	2.221	0.011*
Yes, 1-2 times a day	169	33.8		
Yes, after every hand wash	96	19.2		
Yes, several times a week	97	19.4		
Total	500	100.0		

*P<0.05 is significant

allergic to latex. Latex allergy was most common and presented as facial edema (19.4%). Most of the subjects washed their hands and used hand sanitizers after gloves. Only 12.2% used special soap for sensitive skin. The use of hand moisturizer and protective cream was every day among dental staff and students. A statistically significant relation was found among most of the questions ($P < 0.05$) [Table 2, Graphs 1 and 2].

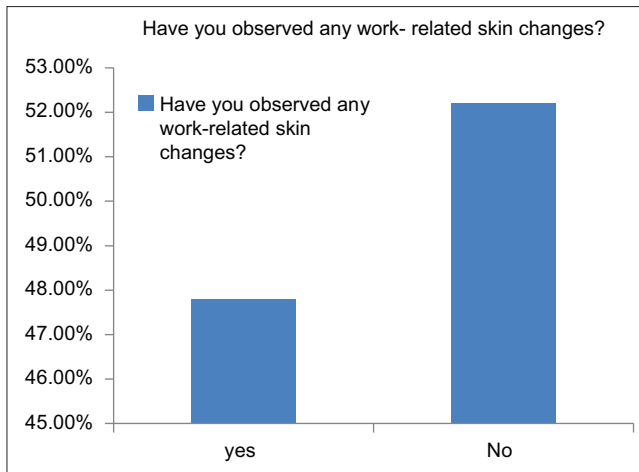
Frequency distribution of respondents based on the response to questionnaire by dentists and dental student

Knowledge and awareness regarding skin lesions were compared among dental students and dentists, and a significant difference

was observed between both. Dentists were observed to be more aware than dental students [Table 3].

Discussion

Among dental students and professionals, skin disorders due to exposure to the workplace are quite common. However, dental health care workers are not very careful regarding these skin issues and pay little attention to seeking treated by a dermatologist. Besides dentists, assistants, and technicians, dental interns and students should also remain vigilant of skin lesions encountered when they begin clinical and laboratory work in dental offices (especially latex allergy, allergy to dental materials, etc.).



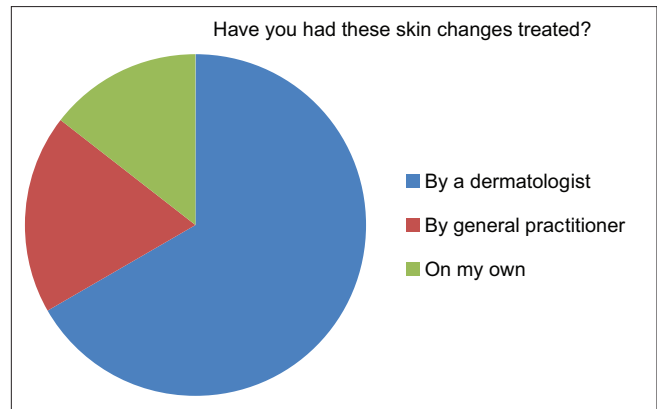
Graph 1: Frequency distribution of subjects based on the response to work-related skin lesions

Thus, the present survey was conducted to assess the incidence, awareness, and knowledge about occupation-induced skin lesions among dentists and dental students. Dental interns, students, and dental health care workers, that is, dentists, dental technicians, and assistants, were assessed.

Forty-seven point eight percent of subjects encountered work-related skin disorders. Most of the skin lesions were seen on the hands and fingers. Similar to our study, Lugovic-Mihic *et al.*^[5] also observed that contact dermatitis was the most common occupational disease amongst medical personnel. As dentists and dental technicians mainly use their hands for various clinical and laboratory procedures, hands are the most common body part of skin lesions.

We observed that the common signs and symptoms of skin lesions were vesicles and erythema. Similar to our study, Kurpiewska *et al.*^[9] found that inflammation, dryness, and erythema in 80% of cases affected the skin of the hands. In the present study, eczema was the most common sign for dental professionals to report to a dermatologist. Similar to our study, Minamoto *et al.*^[10] reported that 46.4% of dental workers reported a lifetime history of chronic hand eczema that might be attributed to the fact that health care workers more often prefer to use soaps than the alcohol-based-hand-rub due to a wrong belief that it aggravates the undesirable skin effects. This leads to the deterioration of hand's skin condition such as impaired barrier function, change in skin flora, more bacterial shedding, and higher sensitivity of the skin. They found that rubber chemicals and acrylates were the most frequent occupationally relevant contact allergens.

In the present study, we observed that latex allergy was the most common, and the most commonly performed skin test was the skin prick test. Similar to our study, Vangveeravong *et al.*^[11] revealed that dental students had latex allergies, primarily as hand itching (64.5%), hand eczema (19.4%), and contact urticaria (16.1%). Japundzic *et al.* in 2018^[12] and Japundzic *et al.*



Graph 2: Frequency distribution of subjects based on the response to treatment of skin lesions

in 2019^[13] observed that 7% of dental professionals and students were allergic to latex in a skin prick test.

According to guidelines of contact dermatitis, skin lesions that occur due to occupational insults should be timely recognized and adequate protective measures like work-related precautionary measures, personal protective clothing, and reliable dermatological treatment should be taken.^[14] In the present study, we observed that the use of skin moisturizers, protective hand creams, and soaps was quite limited. Similar findings were observed in a study by Minamoto *et al.*^[10] that showed a lack of knowledge among dental workers about skin protective measures, indicating the need for education on skin protective measures.

In our study, even dental professionals were unaware that work-related skin lesions should be immediately reported to a dermatologist and that consistent treatment for the same is required.

Most of them believed in taking self-prescribed therapy rather than taking a dermatologist's assistance. Thus, the barrier was a lack of awareness among dental students and dental professionals about the treatments available for occupational skin lesions within the health care system and how to access them. The World Health Organization (WHO) has highlighted the use of preventive measures for work-induced skin lesions, including the avoidance of bad habits like inappropriate use of gloves, disinfectants, hot water, excessive hand-washing, etc.^[15]

Our study indicated a lack of awareness among dental professionals and students regarding taking care of their skin and managing work-related dermatological lesions at the earliest. Thus, it is essential to highlight the importance of various preventive measures and implement them using different educational skincare programs. Individual counseling regarding allergic tests can also be implemented. The provision of hand moisturizers can be emphasized in dental operatories and laboratories so that the incidence of occupational contact dermatitis and hand eczema can be minimized.^[4]

Table 3: Response to questionnaire by dentists and dental students

Options	Dentist (n=200)		Dental students (n=300)		Statistical analysis	
	Frequency	Percentage	Frequency	Percentage	Chi-squared test	P
Q1. How many hours do you work per day?						
12 h or more	10	5	7	2.333333	12.009	0.032*
6 h or less	60	30	91	30.33333		
7-8 h	100	50	102	34		
9-11 h	30	15	100	33.33333		
Q2. How many days do you work in a week?						
1-2 days	8	4	17	5.666667	2.679	0.025*
3-4 days	69	34.5	123	41		
5-6 days	123	61.5	160	53.33333		
Q3. Do you take any medications that may cause dry skin?						
I'm not sure	10	5	60	20	13.110	0.042*
No	170	85	200	66.66667		
Yes	20	10	40	13.33333		
Q4. Have you observed any work-related skin changes?						
No	80	40	146	48.66667	12.008	0.018*
Yes	120	60	154	51.33333		
Q5. If yes, choose the symptoms and signs you've observed (n=239)						
Dryness	57	28.5	78	26	12.772	0.029*
Erythema	46	23	87	29		
Vesicles	20	10	50	16.66667		
Itching	57	28.5	20	6.666667		
Rash	7	3.5	30	10		
Scaling	13	6.5	35	11.66667		
Q6. Where have these changes appeared?						
Not applicable	80	40	146	48.66667	12.881	0.042*
On hands and fingers only	90	45	100	33.33333		
On other areas	30	15	54	18		
Q7. Have you visited a dermatologist for those skin-related changes?						
No	30	15	54	18	10.008	0.039*
Not applicable	80	40	146	48.66667		
Yes	90	45	100	33.33333		
Q8. If you had visited a dermatologist, what was your diagnosis? (n=190)						
Acne	2	1	3	1	2.001	0.044*
Skin dryness	3	1.5	4	1.333333		
Contact urticaria	3	1.5	4	1.333333		
Dryness	3	1.5	6	2		
Eczema (atopic dermatitis)	35	17.5	30	10		
Hair loss	5	2.5	10	3.333333		
Fungal infection	2	1	10	3.333333		
Irritant contact dermatitis	5	2.5	13	4.333333		
Allergic contact dermatitis	32	16	20	6.666667		
Q9. Have those work-related skin lesions had a bad psychological effect on you? (n=239)						
No	30	15	140	46.66667	10.98	0.015*
Yes	9	4.5	60	20		
Q10. Have you had these skin changes treated? (n=69)						
Yes, by a dermatologist	7	3.5	46	15.33333	19.891	0.014*
Yes, by a general practitioner	1	0.5	13	4.333333		
Yes, on my own	1	0.5	10	3.333333		
Q11. Have you undergone allergy tests?						
Patch test	4	2	8	2.666667	6.610	0.012*
Skin prick test	25	12.5	10	3.333333		
Q12. Which type of gloves do you wear at work?						
I'm not sure	10	5	70	23.33333	2.823	0.039*
Latex gloves	150	75	130	43.33333		

Contd...

Table 3: Contd...

Options	Dentist (n=200)		Dental students (n=300)		Statistical analysis	
	Frequency	Percentage	Frequency	Percentage	Chi-squared test	P
Latex- free gloves	40	20	100	33.33333		
Q13 Have you been diagnosed with latex allergy?						
No, but I have noticed a rash after using latex gloves	30	15	40	13.33333	11.101	0.011*
No, I don't have latex allergy	125	62.5	160	53.33333		
Not applicable	40	20	40	13.33333		
Yes	5	2.5	60	20		
Q14. Which of the following have you experienced after using latex gloves?						
Anaphylaxis (shock)	40	20	80	26.66667	11.090	0.042*
Facial edema	20	10	80	26.66667		
Itching	40	20	40	13.33333		
Skin flushing	45	22.5	40	13.33333		
Respiratory symptoms	35	17.5	30	10		
Runny nose	10	5	15	5		
Rash	10	5	15	5		
Q15. How often do you wash your hands after using latex gloves?						
Always	110	55	90	30	1.400	0.021*
Never	5	2.5	30	10		
Not applicable	5	2.5	40	13.33333		
Often	80	40	140	46.66667		
Q16. How often do you use a hand sanitizer?						
Not applicable	1	0.5	5	1.666667	5.609	0.015*
Always	140	70	165	55		
Never	39	19.5	30	10		
Often	20	10	100	33.33333		
Q17. If you have been diagnosed with latex allergy, has this been documented in your medical record?						
No	80	40	100	33.33333	9.717	0.015*
Not applicable	10	5	120	40		
Yes	110	55	80	26.66667		
Q18. Do you use soap for sensitive skin?						
No	70	35	130	43.33333	7.801	0.026*
Sometimes	20	10	100	33.33333		
Yes	110	55	70	23.33333		
Q19. Do you use any hand protective cream?						
No	30	15	120	40	1.228	0.021*
Yes, 1-2 times a day	70	35	80	26.66667		
Yes, after every hand wash	80	40	80	26.66667		
Yes, several times a month	20	10	20	6.666667		
Q20. Do you use a hand moisturizer?						
No	30	15	120	40	1.228	0.021*
Yes, 1-2 times a day	70	35	80	26.66667		
Yes, after every hand wash	80	40	80	26.66667		
Yes, several times a week	20	10	20	6.666667		
Total			500	100.0		

*P<0.05 is significant

It has been observed that skin-related problems are quite common; around 6% of patients visiting physicians suffer from dermatological issues; an even higher percentage of such patients visit primary care settings that play an important role in delivering the right information and primary care to the patients and in referring the patients to specialists whenever required.^[16] Proper knowledge on skin-related conditions and their preventive measures is essential for primary care physicians.

The appropriate precautions and preventive measures are highly useful in both the clinical and laboratory set-ups of dentistry to improve the quality of work.^[17,18] The implementation of these measures depends on the economic and social setups of the country. As of now, no studies have been reported in the literature that reveal the aspect of work-related skin disorders among dental health care workers in Saudi Arabia. Thus, the present study can provide an insight into this commonly ignored topic, thus helping dental professionals take precautions and

seek treatment to such work-related skin disorders at the earliest possible time.

Limitations

The sample size was small due to time constraints. Future studies can involve a larger sample size for application of results on a wider population. In addition to a subjective perspective, the objective evaluation of skin lesions for dental professionals and students would further validate the outcome of such research.

Strength

The study is the first of its kind on southern Saudi Arabia that assesses awareness and considerations regarding work-related dermatological issues among dentists and dental students.

Conclusion

Within the limitations of the study, the present study revealed that the level of awareness was significantly better among dentists than dental students, but still lacked awareness regarding work-related skin lesions and getting them treated by dermatologists at the earliest. Thus, it is required to implement various educational programs about dermatological lesions that can occur during clinical and laboratory dental setup so that dental professionals and students take necessary precautions and seek treatment for skin disorders.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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