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Authors	Kiely, L. F.;Moloney, E.;O'Sullivan, G.;Eustace, Joseph A.;Gallagher, J.;Bourke, J. F.
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**University College Cork, Ireland**  
Coláiste na hOllscoile Corcaigh

DR LISA KIELY (Orcid ID : 0000-0003-1100-8692)

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# **Irritant contact dermatitis in healthcare workers as a result of the COVID-19 pandemic: a cross-sectional study**

L.F. Kiely,<sup>1</sup> E. Moloney,<sup>1</sup> G. O'Sullivan,<sup>2</sup> J.A. Eustace,<sup>3</sup> J. Gallagher<sup>3</sup> and J.F. Bourke<sup>1,4</sup>

Departments of <sup>1</sup>Dermatology, and <sup>2</sup>Occupational Health, Cork University Hospital, Wilton, Cork, Ireland

<sup>3</sup>Clinical Research Facility, University College Cork, Gaol Walk, University College, Cork, Ireland

<sup>4</sup>Department of Dermatology, South Infirmary Victoria University Hospital, Old Blackrock Rd, Cork, Ireland

**Corresponding author:** Dr. Lisa F Kiely

**Email:** lkiely@gmail.com

**ORCID:** 0000-0003-1100-8692

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### **What is already known about this topic?**

- Irritant contact dermatitis amongst healthcare workers secondary to the COVID-19 pandemic is emerging as a significant issue.
- Prevalence data in the UK and Ireland is limited.

### **What does this study add?**

- There was an 82% prevalence of occupational dermatitis since the onset of the COVID-19 pandemic in our cohort.
- This is likely a reflection of a wider global issue.
- This provides a platform for dermatologists and occupational health experts to tackle this emerging problem.

## Abstract

COVID-19 healthcare workers (HCW) require frequent hand-washing and personal protective equipment(PPE) to prevent infection. However evidence is emerging that these practices are causing adverse effects on their skin integrity.

A single centre cross sectional study of HCW from an Irish hospital was undertaken to evaluate the degree of COVID-19 related dermatitis between April and May 2020.

Out of 270 participants surveyed, 223(82.6%) reported symptoms of dermatitis. Hands were the most commonly affected site(76.47%) and the most frequently reported symptom was dry skin(75.37%). 268(99.26%) HCW increased hand-washing frequency, however 122(45.35%) denied using emollients. 24.7% of the dermatitis group cited a history of dermatitis compared to 4.3% of unaffected staff.( $p < 0.001$ )The dermatitis group recorded PPE usage for an average of 3.15 hours versus the non-dermatitis group at 1.97 hours( $p = 0.211$ ).

Promoting awareness of COVID-19 related dermatitis is vital to highlight prevention and treatment for our frontline staff.

## **Introduction:**

Healthcare workers(HCW) at the front line of the COVID-19 outbreak response are exposed to hazards that put them at risk of infection. Frequent hand hygiene and appropriate personal protective equipment(PPE) is recommended to prevent transmission of the virus.(1) However there is evidence to suggest that these practices are having a negative impact on skin health.(2) HCW in particular represent a high-risk group for developing occupational dermatitis(3) which can have a multitude of negative effects including decreased compliance with proper PPE and adequate handwashing.(4)

We sought to evaluate the degree to which frontline staff members from a large tertiary hospital have been affected with dermatitis as a result of the COVID-19 pandemic.

## **Report:**

We performed a single centre cross-sectional study from April 29th to May 13th 2020. Self-administered questionnaires were distributed amongst staff at Cork University Hospital, Cork, Ireland. Approximately 500 online surveys were sent via email or text message and 500 hard copies were distributed to the emergency department(ED), hospital wards and intensive care units(ICU). The questionnaire enquired about duration of PPE exposure, whether there was an increased frequency of hand washing, symptoms of dermatitis and alleviating measures trialed. Data was collected on Microsoft Excel and analysed using SPSS.

Altogether there were 270 responses (27% response rate). 197 (77.41%) were female and 57 (22.59%) were male staff members. 111(41%) of respondents worked on medical wards, 26(9.6%) in the ED, 32(11.8%) in the ICU and 58 were(21.4%) in a surgical specialty. Nurses comprised 51.7%(140) of our data, doctors 25.1% (68), 10.3% (28) allied health members and 8.5%(23) healthcare assistants.

In total, 223(82.6%) respondents reported signs and symptoms of dermatitis. Affected sites included hands, nose, cheeks and forehead with the hands being the

most commonly affected site(76.47%) followed by the nose(13.73%) and cheeks(12.55%). The most frequently reported symptom was dry skin with 75.37% of staff affected. 36.94% described redness and 27.61% complained of itching.

Virtually all(268, 99.26%) HCW reported an increase in frequency of hand-washing however 122(45.35%) staff members denied using emollients or other topical treatments.

Atopy was not related to the development of dermatitis but our study found that a history of dermatitis contributed significantly with 55(24.7%) of the dermatitis group citing a history of dermatitis compared to 4.3% of unaffected staff.( $p < 0.001$ )

The dermatitis group recorded PPE usage for an average of 3.15 hours compared with the non-dermatitis group using continuous PPE for 1.97 hours, however this fell short of significance( $p = 0.211$ ).

### **Discussion:**

Almost all staff increased their frequency of hand washing in line with international guidance and over 80% of our sample reported signs or symptoms of dermatitis.

There is no doubt of the crucial importance of hand hygiene and appropriate PPE when exposed to COVID-19 patients,(1) however there is emerging evidence that this practice is causing significant morbidity amongst frontline staff. One multicentre study from Wuhan, China reports up to 74.5% of staff members were affected by dermatitis (5) and a further study from Hubei, China describes a staggering 97% of workers affected.(6) Hand washing alone is not the only contributor, as further data from China reports the detrimental role that N95 masks play.(7)

Over 45% of our surveyed staff denied any use of emollients. As COVID will likely be a persistent and recurrent problem, rates of frontline staff dermatitis will likely increase accordingly. Facial ulceration and attempts to manipulate respirators to alleviate pressure could hinder the

effectiveness (8) and reduce compliance with PPE equipment putting HCW at increased risk of exposure to SARS-Cov2.

The limitations of our study include self-selection bias, as symptomatic staff are more inclined to complete the survey. Also, as this was a single centre study with a small sample size, it only provides a snapshot of a global problem.

Our study has highlighted the issue of irritant contact dermatitis among a sample of Irish HCW. Data from other European countries is limited. Prolonged PPE use among HCW is currently a global issue with no end date in sight. National figures for affected healthcare staff would contribute to a better understanding of the issue and input from dermatology and occupational health experts may aid educational initiatives in healthcare settings.

In conclusion, healthcare related dermatitis as a result of the COVID-19 pandemic is emerging as a significant problem on an international scale. It is vital to promote awareness of this issue in order to provide appropriate prevention and timely treatment for our healthcare staff on the frontline.

### **Ethical approval**

This study has received full ethical approval from the Clinical Research Ethics Committee of the Cork Teaching Hospitals.

### **Author contributions**

*Study concept:* Lisa F. Kiely, Elizabeth Moloney and John F. Bourke. *Study design:* Lisa F. Kiely, Elizabeth Moloney, Grainne O' Sullivan, John Gallagher and John F. Bourke. *Data Collection:* Lisa F. Kiely. *Analysis and interpretation of data:* Lisa F. Kiely, Joseph A. Eustace, Grainne O'Sullivan, John Gallagher and John F. Bourke. *Drafting of the manuscript:* Lisa F. Kiely.



*Critical revision of the manuscript for important intellectual content:* Elizabeth Moloney, Grainne O' Sullivan, John Gallagher and John F. Bourke. *Statistical analysis:* Lisa F. Kiely, Joseph A. Eustace and John F. Bourke. *Study supervision:* Elizabeth Moloney, Grainne O' Sullivan, John Gallagher and John F. Bourke.

#### **Data availability statement**

All data is available upon request.

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**Learning points:**

- Irritant contact dermatitis amongst healthcare workers as a result of the COVID-19 pandemic is emerging as a significant issue.
- Currently data on the prevalence of COVID-19 related dermatoses in the UK and Ireland is limited.
- Over 80% of our cohort was affected with irritant dermatitis secondary to the COVID-19 outbreak.
- Healthcare workers with a history of dermatitis were more at risk of developing an occupation dermatitis.
- 45% of staff denied using emollients or alleviating factors.

- It is crucial to promote awareness of this issue in order provide treatment and preventative measures for our frontline staff.