Personal protective equipment

Personal protective equipment (PPE) is protective clothing, helmets, goggles, or other garments or equipment designed to protect the wearer's body from injury or infection. The hazards addressed by protective equipment include physical, electrical, heat, chemicals, biohazards, and airborne particulate matter. Protective equipment may be worn for job-related occupational safety and health purposes, as well as for sports and other recreational activities. “Protective clothing” is applied to traditional categories of clothing, and “protective gear” applies to items such as pads, guards, shields, or masks, and others. PPE suits can be similar in appearance to a cleanroom suit.

The COVID-19 pandemic led to an unprecedented increase in the use of personal protective equipment (PPE) among medical personnel. The goal of this study was to determine the risk factors and frequency of PPE-induced headaches during the COVID-19 pandemic.

From January 25 to March 1, 2021, an anonymous online survey was undertaken in the Baltic states.

In total, 2132 individuals participated. 52.3% experienced a Personal protective equipment-induced headache. The usual onset time was between 2-3 h, lasting up to 1 h after PPE removal. The most common localization was in temporal and frontal regions. The headache usually occurred 2 to 3 days per week with an average pain score of 5.04 ± 1.80 points. Higher risk was associated with discomfort/pressure OR = 11.55, heat stress OR = 2.228, skin conditions OR = 1.784, long PPE use (duration 10-12 h) OR = 2,18, headache history prior PPE use OR = 1.207. Out of 52.3% of respondents with PPE-induced headaches, 45.5% developed de novo headaches, whereas 54.5% had a headache history. Statistically significant differences of PPE-induced headache between respective groups included severity (4.73 vs 5.29), duration (≥ 6 h 6.7% vs 8.2%), accompanying symptoms (nausea (19.3% vs 25.7%), photophobia (19.1% vs 25.7%), phonophobia (15.8% vs 23.5%), osmophobia (5.3% vs 12.0%)) and painkiller use (43.0% vs 61.7%).

Over half of the medical personnel reported headaches while using PPE. The risk was higher in individuals with headache history, increased duration of PPE use, and discomfort while using PPE. Predisposed individuals reported PPE-induced headache which persisted longer, and was more intense and debilitating than in the respondents with de novo headache [1)].

Addressing insufficient PPE access, poor communication from supervisors, and community stigma may improve provider mental well-being during the COVID-19 pandemic [2)].

Cook TM. Personal protective equipment during the COVID-19 pandemic - a narrative review. Anaesthesia. 2020 Apr 4. doi: 10.1111/anae.15071. [Epub ahead of print] Review. PubMed PMID: 32246849.

Kamerow D. Covid-19: the crisis of personal protective equipment in the US. BMJ. 2020 Apr 3;369:m1367. doi: 10.1136/bmj.m1367. PubMed PMID: 32245847.

Livingston E, Desai A, Berkwits M. Sourcing Personal Protective Equipment During the COVID-19 Pandemic. JAMA. 2020 Mar 28. doi: 10.1001/jama.2020.5317. [Epub ahead of print] PubMed PMID: 32221579.

Jy Ong J, Bharatendu C, Goh Y, Zy Tang J, Wx Sooi K, Lin Tan Y, Yq Tan B, Teoh HL, Ting Ong S, Allen DM, Sharma VK. Headaches Associated with Personal Protective Equipment - A Cross-sectional Study Amongst Frontline Healthcare Workers During COVID-19 (HAPPE Study). Headache. 2020 Mar 30. doi: 10.1111/head.13811. [Epub ahead of print] PubMed PMID: 32232837.

Ranney ML, Griffeth V, Jha AK. Critical Supply Shortages - The Need for Ventilators and Personal Protective Equipment during the Covid-19 Pandemic. N Engl J Med. 2020 Mar 25. doi: 10.1056/NEJMp2006141. [Epub ahead of print] PubMed PMID: 32212516.

Kantor J. Behavioral considerations and impact on personal protective equipment (PPE) use: Early lessons from the coronavirus (COVID-19) outbreak. J Am Acad Dermatol. 2020 Mar 11. pii: S0190-9622(20)30391-1. doi: 10.1016/j.jaad.2020.03.013. [Epub ahead of print] PubMed PMID: 32171806.

Rimmer A. Covid-19: GPs call for same personal protective equipment as hospital doctors. BMJ. 2020 Mar 13;368:m1055. doi: 10.1136/bmj.m1055. PubMed PMID: 32169866.

Cai SJ, Wu LL, Chen DF, Li YX, Liu YJ, Fan YQ, Du SH, Huang H, Liu N, Cheng LL, Deng XL, Li SY. [Analysis of bronchoscope-guided tracheal intubation in 12 cases with COVID-19 under the personal protective equipment with positive pressure protective hood]. Zhonghua Jie He He Hu Xi Za Zhi. 2020 Mar 5;43(0):E033. doi: 10.3760/cma.j.cn112147-20200222-00153. [Epub ahead of print] Chinese. PubMed PMID: 32133829.

1)
Jokubaitis M, Timofejavaitė R, Braschinsky M, Zvaune L, Leheste AR, Gribuste L, Mattila P, Strautmane S, Dapkutė A, Ryliškienė K. Risk factors for development of personal protective equipment induced headache: e-survey of medical staff in Baltic states. BMC Health Serv Res. 2022 Aug 10;22(1):1016. doi: 10.1186/s12913-022-08412-5. PMID: 35948960.

2)
Sharma M, Creutzfeldt CJ, Lewis A, et al. Healthcare professionals' perceptions of critical care resource availability and factors associated with mental well-being during COVID-19: Results from a US survey [published online ahead of print, 2020 Sep 2]. Clin Infect Dis. 2020;ciaa1311. doi:10.1093/cid/ciaa1311