

# Using Personal Protective Equipment by Healthcare Personnel Challenges and Recommendations a Mini Review Study

**Samaneh Alizadeh\***

Department of Medical-Surgical Nursing, Student Research Committee, Faculty of Nursing & Midwifery, Tabriz University of Medical Sciences, Iran



\*Corresponding author: Samaneh Alizadeh, Faculty of Nursing & Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran

## ARTICLE INFO

**Received:** 📅 March 28, 2022

**Published:** 📅 April 14, 2022

**Citation:** Samaneh Alizadeh. Using Personal Protective Equipment by Healthcare Personnel Challenges and Recommendations a Mini Review Study. Biomed J Sci & Tech Res 43(2)-2022. BJSTR. MS.ID.006877.

**Keywords:** Personal Protective Equipment; Health Care Personnel; Challenges; Recommendations

## ABSTRACT

**Aim:** The present mini review aimed to summarize the existing knowledge regarding the challenges to using personal protective equipment by healthcare personnel and suggested solutions.

**Methods:** This study is a review of relevant publications about the aim of study.

**Results:** In total, 12 articles were evaluated in this study, and the results were presented in two

**Sections:** challenges to using personal protective equipment and suggested solutions.

**Conclusion:** The results of this study can be considered for the development of future plans and strategies to provide solutions to better manage the use of personal protective equipment during crises.

## Introduction

By accelerating the epidemic of Coronavirus 2019 (Covid-19), global health care systems have been overshadowed with potential infectious patients who seek care [1-3]. Prevention of the incidence of infection in Health Care Workers (HCWs) and patients dependent on the effective use of Personal Protective Equipment (PPE) [4-6]. Personal Protection Equipment (PPE) are clothes or devices designed to protect employees against physical hazards while working at work. PPE should only be considered as the last defensive line between risk and staff [7]. Attempts to control the dangers of the workplace should always be reviewed at first [8]. Although Personal Protective Equipment (PPE) is one of the best protection lines against exposure, many health care workers face obstacles and problems in their use, the purpose of this mini review

study is extraction of challenges and solutions in the literature about the use of personal protection equipment by health care personnel [9-12].

## Methods

This study is a review of relevant literatures about the challenges to using personal protective equipment by healthcare personnel and suggested solutions [13-15]. To meet the study aims, we searched the databases of SID, Irandoc, Google Scholar, PubMed, Medline, Scopus, Cochrane Library, and ScienceDirect to find articles published during 2005-2021, using the keywords of Personal protective equipment, Health care personnel, Challenges, Recommendations [16].

## Results

In total, 12 articles were evaluated in this study, and the results were presented in two sections: challenges to using personal protective equipment and suggested solutions (Tables 1 & 2).

**Table 1:** Challenges to using personal protective equipment.

Dimensions of Challenge	Influential Factors
knowledge and awareness	Knowledge gap and training deficiencies among healthcare professionals on the proper use of personal protective equipment, transmission, and other infection control issues
Attitude	<p>Personnel who think they do not need personal protective equipment.</p> <p>Personnel who are concerned about the effectiveness of personal protective equipment and feel the need for better protective clothing.</p> <p>The notion that patients are safe.</p> <p>The idea that wearing personal protective equipment impairs the ability to do work.</p>
Function	<p>Laziness in wearing personal protective equipment</p> <p>Failure to follow the instructions for removing equipment</p>
Physical and communication limitations	<p>Feeling uncomfortable or uncomfortable with personal protective equipment</p> <p>Feeling very hot</p> <p>feeling exhausted</p> <p>Time consuming and cumbersome clothes</p> <p>Decreased mobility and vision</p> <p>Fear of obstruction by doctors</p>
Physical hazards and injuries	<p>Allergies</p> <p>Physiological pressures such as respiratory problems, dehydration, heat stress and sweating</p> <p>Risk of contamination</p> <p>Skin damage due to frequent contact (although more has been reported in the use of masks)</p>
Management issues	<p>Inadequate access to personal protective clothing</p> <p>Lack of equipment</p> <p>Time-consuming to comply with personal protection standards</p> <p>Non-standard personal protective equipment</p>
Features of protective equipment	<p>Inefficiency of personal protective equipment</p> <p>Unattractive appearance of equipment and issues related to its fit in the body (size adjustment)</p>
Working conditions	<p>In emergencies, taking precautions to protect yourself may put the patient at risk</p> <p>Adherence to standard precautions interferes with care delivery</p> <p>Unpredictability of infection in some work conditions</p> <p>Prioritize the patient and provide care to meet the patient’s needs and lack of time to follow standard precautions</p> <p>Creating fear in the patient by wearing personal protective clothing</p>

**Table 2:** Recommendations to using personal protective equipment.

Levels of Intervention	Activities	Recommendations
National	Maximum and principled access to personal protective equipment	Minimize the need for personal protective equipment
		Ensure the rational and appropriate use of personal protective equipment
		Coordination of supply chain management mechanisms of personal protective equipment
Hospitals	Promote a culture of safety	Conscious planning and preparation at leadership and organizational levels
		Comprehensive education for all staff, including supervisors and managers
		Extensive availability of personal protective equipment
		Accountability at all levels of the organization
Management Interventions	Provide appropriate protective equipment	Pursue the improvement and standardization of personal protective equipment
	Ensure proper use of supervised personal protective equipment by staff	Clarification of protocols for the use of personal protective equipment based on further scientific evidence
		Strengthen education in the use of personal protective equipment with innovative methods
	Ensure staff tolerance and compatibility with personal protective clothing	Identify and disseminate the best strategies to improve compatibility and use of personal protective equipment
		Efforts and dissemination of efforts to adapt to personal protective equipment
		Perform medical advice on personnel with underlying diseases to ensure tolerance of protective equipment
	Motivate staff to take responsibility for the proper use of personal protective equipment	Availability and participation in training and energy recovery courses
		The supervisor uses personal protective equipment
		Colleagues use personal protective equipment
		Organizational support of employee safety and health
Positive reinforcement of individual adaptation behavior		
	Negative reinforcement (e.g. verbal warnings)	
Individual Interventions	Commitment to implementing personal protective equipment standards	Individual identification, verbal communication, environment temperature regulation

### Discussion

In this study the results were presented in two sections: challenges to using personal protective equipment and suggested solutions. In the context of the COVID-19 pandemic, one of the most important national interventions is the maximum and principled access to personal protective equipment through the following means:

- a) Minimize the need for personal protective equipment.
- b) Make sure the use of personal protective equipment is reasonable and appropriate.
- c) Coordinate supply chain management mechanisms [13].

It is also necessary to intervene in hospitals to create a strong safety culture in the organization that leads to more compliance

with precautionary standards in the field of infection control by staff and reduce injury to them [14]. Studies show that in order to create an effective safety culture, both employers and employees must share individual and organizational safety responsibilities. Although most of the responsibility lies with the organizational management, employees should also be responsible for enforcing safety practices in their workplace [15,16]. A noteworthy point for managers is that the ways to deal with barriers to protective equipment have their limitations only through individual efforts. Intervention at the national and organizational levels is likely to have a greater impact on improving compliance [17-22].

### Conclusion

In this study challenges to using personal protective equipment and suggested solutions were extracted, the results of this study can

be considered for the development of future plans and strategies to provide solutions to better manage the use of personal protective equipment during crises.

## Acknowledgment

The authors would like to express their gratitude to the faculty members of the School of Nursing and Midwifery of Tabriz University of Medical Sciences for their valuable comments in accomplishing this study.

## Conflict of Interests

The author declares no conflicts of interest.

## Funding/Support

The study received no funding from any public or private organization.

## Ethical Approval

Not applicable.

## References

- Akagbo SE, Nortey P, Ackumey MM (2017) Knowledge of standard precautions and barriers to compliance among healthcare workers in the Lower Manya Krobo District Ghana. *BMC research notes* 10(1): 432.
- Baloh J, Reisinger HS, Dukes K, da Silva JP, Salehi HP, et al. (2019) Healthcare workers' strategies for doffing personal protective equipment. *Clinical Infectious Diseases* 69(3): 192-198.
- Chen X, Shang Y, Yao S, Liu R, Liu H (2020) Perioperative care provider's considerations in managing patients with the COVID-19 infections. *Transl Perioper Pain Med* 2020(7): 216-224.
- Efstathiou G, Papastavrou E, Raftopoulos V, Merkouris A (2011) Factors influencing nurses' compliance with Standard Precautions in order to avoid occupational exposure to microorganisms A focus group study. *BMC nursing* 10(1): 1.
- Fierro JL, Middleton M, Smallwood AN, Rettig S, Feudtner C, et al. (2015) Barriers to the use of PPE to prevent pertussis exposures in a pediatric primary care network. *Journal of the Pediatric Infectious Diseases Society* 4(1): 49-56.
- Harrod M, Petersen L, Weston LE, Gregory L, Mayer J, et al. (2019) Understanding workflow and personal protective equipment challenges across different healthcare personnel roles. *Clinical Infectious Diseases* 69(3): 185-191.
- Honda H, Iwata K (2016) Personal protective equipment and improving compliance among healthcare workers in high-risk settings. *Current opinion in infectious diseases* 29(4): 400-406.
- Hu X, Zhang Z, Li N, Liu D, Zhang L, et al. (2012) Self-reported use of personal protective equipment among Chinese critical care clinicians during 2009 H1N1 influenza pandemic. *PLoS One* 7(9): 44723
- Islam A (2020) Use of PPE in response of coronavirus (COVID-19): A smart solution to global economic challenges.
- Kang J, Kim EJ, Choi JH, Hong HK, Han SH, et al. (2018) Difficulties in using personal protective equipment: Training experiences with the 2015 outbreak of Middle East respiratory syndrome in Korea. *American journal of infection control* 46(2): 235-237.
- Kang J, O Donnell JM, Colaianni B, Bircher N, Ren D, et al. (2017) Use of personal protective equipment among health care personnel: results of clinical observations and simulations. *American journal of infection control* 45(1): 17-23.
- Liverman CT, Larson EL (2011) Preventing Transmission of Pandemic Influenza and Other Viral Respiratory Diseases: Personal Protective Equipment for Healthcare Personnel Update 2010. National Academies Press.
- (2020) Organization WHO. Rational use of personal protective equipment for coronavirus disease (COVID-19) interim guidance 27 February 2020. World Health Organization.
- Phan LT, Maita D, Mortiz DC, Weber R, Fritzen Pedicini C, et al. (2019) Personal protective equipment doffing practices of healthcare workers. *Journal of occupational and environmental hygiene* 16(8): 575-581.
- Punia S, Nair S, Shetty RS (2014) Health care workers and standard precautions perceptions and determinants of compliance in the emergency and trauma triage of a tertiary care hospital in south India. *International scholarly research notices*.
- Pyrek KM (2011) Addressing the Challenges of PPE Non-Compliance.
- Pyrek KM (2016) Breaking Barriers Compliance with Standard Precautions PPE Needs Improvement.
- Verbeek JH, Rajamaki B, Ijaz S, Sauni R, Toomey E, et al. (2020) Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff. *Cochrane Database of Systematic Reviews* 4(4).
- Livingston E, Desai A, Berkwits M (2020) Sourcing personal protective equipment during the COVID-19 pandemic. *JAMA* 323(19): 1912-1914.
- Loibner M, Hagauer S, Schwantzer G, Berghold A, Zatloukal K (2019) Limiting factors for wearing personal protective equipment (PPE) in a health care environment evaluated in a randomised study. *PLoS one* 14(1): 0210775.
- Okamoto K, Rhee Y, Schoeny M, Lolans K, Cheng J, et al. (2019) Impact of doffing errors on healthcare worker self-contamination when caring for patients on contact precautions. *Infection Control & Hospital Epidemiology* 40(5): 559-565.
- Okello T, Kansime K, Odora J, Apio J, Pecorella I (2017) Barriers and factors affecting personal protective equipment usage in St. Mary's Hospital Lacor in Northern Uganda. *East and Central African Journal of Surgery* 22(1): 59-65.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2022.43.006877

Samaneh Alizadeh. Biomed J Sci & Tech Res



This work is licensed under Creative Commons Attribution 4.0 License

Submission Link: <https://biomedres.us/submit-manuscript.php>



#### Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

<https://biomedres.us/>