



# The Impact of Enhanced Personal Protective Equipment on Clinical Skills and Patient Communication within the Healthcare Setting: An Integrative Systematic Review Protocol

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## Introduction

Utilisation of personal protective equipment (PPE) by healthcare workers forms a major part in the effective management of infectious diseases (Loibner et al., 2019). In addition to the protection of healthcare workers, infection control practices help to mitigate the risk of healthcare associated infection; which continues to pose a major global health burden, economically and in terms of patient morbidity and mortality (Verbeek et al., 2020; Allegranzi et al., 2011).

PPE protects the skin and mucous membranes from contamination and prevents transfer to clothing (Mumma et al., 2018). When caring for individuals with an acute respiratory infection, 'enhanced-PPE' requires the use of a particulate respirator, gloves, long sleeved gowns, in addition to goggles or face shields. It is designed to protect the whole body and prevent inhalation of aerosolised pathogen (WHO, 2014).

The COVID-19 pandemic, amongst others (SARS, MERS), have demonstrated potential for widespread community transmission, threatening routine hospital and primary care services. There has been a trend towards the increased use of enhanced-PPE for routine hospital and primary care-based procedures in order to mitigate the risk of pathogenic spread. This is of relevance to the dental field, where professionals are exposed to aerosol and droplets. Studies exploring the impact of Human Factors and Ergonomics support the fact that environmental and equipment changes can influence healthcare worker performance and behaviour (Sasangohar et al.,2020).

It is considered that the use of enhanced-PPE may impact upon the clinical capabilities of healthcare workers, in terms of their visual and motor skills as well as posing a barrier to patient communication (Hines et al., 2020). It is known that enhanced-PPE is being used more routinely by healthcare workers in order to mitigate risk of transmission of acute viral illnesses however, no review exists which synthesises available evidence regarding the potential that enhanced-PPE may have upon clinical skills and patient communication within the healthcare environment.

What is the impact of enhanced-PPE upon clinical skills and patient communication within the healthcare environment?

**Objective One**  
What is the impact of enhanced-PPE upon the clinical skills expected of a healthcare worker or their ability to interact and communicate with the patient?

**Objective Two**  
What is the perceived influence of enhanced-PPE upon the clinical skills expected of a health care worker or their ability to interact and communicate with the patient as defined by the health professional or patient?

## Types of study

With the view to addressing objective one, quantitative study designs will be incorporated. This will include randomised control trials (RCTs) and non-randomised clinical trials (CCTs). Qualitative studies will be included related to both the first and second objectives of the review.

## Types of participants

Both the first and second objectives of this systematic review will give consideration to studies which include healthcare workers. The second objective of this review will also include studies exploring the perspectives of patients receiving care from those using enhanced-PPE.

## Methods

The systematic review will follow the Cochrane methodologies for the completion of systematic reviews of effectiveness studies and qualitative evidence (Higgins et al.,2021; Noyes et al.,2019).

## Types of interventions

Both simulated and real-life studies would be included; the planning and conduct of a randomised controlled trial is likely to be challenging during the event of managing an acute infectious disease. The review will include those studies which investigate either the whole enhanced-PPE ensemble or a single item of enhanced-PPE e.g. particulate respirator.

## Types of phenomenon of interest

The review will include qualitative studies where the phenomenon of interest is a description and interpretation of the experiences of healthcare workers and patients towards the impact of enhanced-PPE upon the clinical skills expected of a health care worker or their ability to interact and communicate.

## Search Strategy and Data Collection

Initial limited searches were conducted in order to identify key text words and index terms which were then used to form comprehensive, database specific search strategies for four databases: Dentistry and Oral Sciences Source; CINAHL via EBSCO, and Medline; Embase via Ovid. Searches will also be completed on the Cochrane database of systematic reviews and the Opengrey literature database for unpublished studies. Two independent reviewers will complete the process of study selection. Any discrepancy in the agreed inclusion will be resolved via discussion, and where necessary, a third reviewer. The extraction of outcome data will make use of standardised data extraction tools and will be undertaken by two independent reviewers.

## Critical Appraisal and Risk of Bias

The papers identified via the selection strategy will then undergo a process of critical appraisal to assess their quality and validity. This assessment of methodological quality will follow standardised critical appraisal checklists for both Effectiveness and Qualitative studies. This includes the Qualitative Appraisal Instrument available via JBI (Lockwood et al.,2020), the RoB 2 tool for randomised studies and the ROBINS-I tool when assessing risk of bias in non-randomised studies (Sterne et al.,2019; Sterne et al.,2016).

## Data Synthesis

The data from included quantitative studies will be combined and reported on via a narrative synthesis and mapping. Where appropriate data from CCTs and RCTs is available, it will be combined via statistical synthesis. Qualitative synthesis will follow the process of meta-aggregation. Where meta-aggregation is not possible, findings will be presented in a narrative form.

## Confidence in Cumulative Evidence

In order to help define the quality of the body of findings derived from this synthesis, and the strength of evidence, the GRADE and ConQual approaches will be adopted for the effectiveness and qualitative studies respectively (Goldet and Howick, 2013; Munn et al.,2014). This will summarise the credibility and dependability of each finding, in a final score which demonstrates the degree of confidence which can be placed in each of the findings.

## Implications for Future Research

This systematic review is being conducted in relation to a wider research project, which aims to explore the lived experiences of dental practitioners when using enhanced-PPE. The review will identify and prioritise issues related to the implementation of enhanced-PPE. This exploratory qualitative study will in turn be used to direct future studies quantifying the impact of enhanced-PPE or piloting strategies to mitigate the impact of enhanced-PPE in specific areas of practice.

**There is a need to be prepared to manage a future acute viral illness and to mitigate the impact that it, and enhanced infection control protocols have upon the provision of effective and patient focussed care.**

## Selected References

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