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Contents lists available at ScienceDirect

American Journal of Infection Control

journal homepage: www.ajicjournal.org



Major article

Current practices and barriers to the use of facemasks and respirators among hospital-based health care workers in Vietnam

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Key Words:

Surgical mask
Cloth mask
Respiratory infection
Pandemic
Influenza
Low- and middle-income countries**Background:** This study aimed to examine the knowledge, attitudes, and practices towards the use of facemasks among hospital-based health care workers (HCWs) in Hanoi, Vietnam.**Methods:** A qualitative study incorporating 20 focus groups was conducted between August 2010 and May 2011. HCWs from 7 hospitals in Vietnam were invited to participate.**Results:** Issues associated with the availability of facemasks (medical and cloth masks) and respirators was the strongest theme to emerge from the discussion. Participants reported that it is not unusual for some types of facemasks to be unavailable during nonemergency periods. It was highlighted that the use of facemasks and respirators is not continuous, but rather is limited to selected situations, locations, and patients. Reuse of facemasks and respirators is also common in some settings. Finally, some participants reported believing that the reuse of facemasks, particularly cloth masks, is safe, whereas others believed that the reuse of masks put staff at risk of infection.**Conclusions:** In low and middle-income countries, access to appropriate levels of personal protective equipment may be restricted owing to competing demands for funding in hospital settings. It is important that issues around reuse and extended use of medical masks/respirators and decontamination of cloth masks are addressed in policy documents to minimize the risk of infection.Copyright © 2015 by the Association for Professionals in Infection Control and Epidemiology, Inc.
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This study was supported by funding from the Australian Research Council (LP0990749).

Conflicts of interest: C.R.M. receives funding from vaccine manufacturers GSK and bio-CSL for investigator-driven research. C.R.M. has held an Australian Research Council Linkage Grant with 3M as the industry partner, for investigator driven research. 3M have also contributed supplies of masks and respirators for investigator-driven clinical trials. H.S. held a National Health and Medical Research Council Australian-based Public Health Training Fellowship at the time of the study (1012631). She also has received funding from vaccine manufacturers GSK, bio-CSL, and Sanofi Pasteur for investigator-driven research and presentations. L.M. is supported by the award of a National Health and Medical Research Council Senior Research Fellowship (Elizabeth Blackburn Fellowship, Public Health). The Kirby Institute received funding from the Australian Government Department of Health and is affiliated with the Faculty of Medicine, University of New South Wales. The remaining authors have no conflicts of interest to declare.

Author contributions: A.C. was responsible for the data management, analysis and preparing a draft of the manuscript. H.S. contributed in the study design and data analysis. R.M. contributed to study design and manuscript review. T.C.D. and P.T.N. assisted with data collection and translation. L.M. assisted with study design and facilitator training. All authors reviewed the final version of the manuscript.

Protection of health care workers (HCWs) from communicable/respiratory infections is essential to promote the health and safety of staff and to maintain the functioning and capacity of the health workforce during outbreaks of emerging infections, such as pandemic influenza, Middle East respiratory syndrome coronavirus (MERS-CoV), and ebola virus.¹⁻³ Infection prevention and control in health care settings involves, among other measures, the use of personal protective equipment (PPE), which encompasses all of the specialized equipment worn by HCWs for protection against health and safety hazards, including gloves, eye protection, head and shoe coverings, and respirators/facemasks.^{4,5}In low-resource settings, where the incidence of infectious disease is high and the hospital environmental conditions are often poor, hospitals may rely heavily on PPE to protect staff. The use of facemasks (including medical and cloth masks) and respirators is strongly recommended by the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) as a standard for transmission-based precaution.^{4,5} But even though this practice is highly recommended, actual policies and practices

regarding the use of facemasks and respirators vary.⁶ For example, whereas the WHO and CDC have the same policy on the use of facemasks/respirators for seasonal influenza, tuberculosis, and ebola virus infection,^{4,7–11} they have different recommendations for pandemic influenza and MERS-CoV.^{4,12,13} Low- and middle-income countries generally adopt policies and guidelines of the WHO and/or the CDC.⁶ The problem is that low-resource countries might not have the ability or finances to adopt infection control policies and respiratory protection guidelines equivalent to those originating from high-resource countries. Therefore, many nonstandardized practices, such as the extended use and reuse of facemasks, are common in low-resource countries; data on these practices are limited, however. Moreover, cloth masks are commonly used in low-resource countries, they are rarely mentioned in infection control policies and guidelines.¹⁴

The appropriate use of facemasks and respirators is important to provide the desired level of protection; however, it requires knowledge, training, and supervision. Compared with other types of PPE, adherence with facemask and respirator use is traditionally low, despite expert recommendations.¹⁵ During a sustained national/international outbreak of a novel viral respiratory infection, health systems may be overwhelmed and existing infection control plans undermined. In 2011, the Institute of Medicine of the US National Academy of Sciences recommended further research into the effectiveness of facemasks/respirators and the factors affecting individuals' willingness and ability to comply with recommendations regarding PPE use.¹⁶

The present study aimed to examine knowledge, attitudes, risk perceptions, and practices regarding the use of facemasks and respirators and barriers to compliance among hospital-based HCWs in Hanoi, Vietnam.

METHODS

Study design

A qualitative study incorporating 20 focus groups was conducted in Hanoi between August 2010 and May 2011. Ethical approval was obtained from the National Institute for National Institute of Hygiene and Epidemiology in Vietnam and the University of New South Wales in Australia. Seven hospitals were purposively selected based on their location and size. Both central (funded nationally) and city (funded by the city of Hanoi) hospitals were included. HCWs (physicians and nurses) from selected departments within these hospitals in Hanoi were invited through advertisements and snowball technique. Purposive samples were obtained from physicians and nurses from various departments to ensure diversity. Departments were selected on the basis of the risk of repeated and multiple staff exposures to viral respiratory infections.

A total of 20 focus groups with 10–12 participants per group were conducted. Separate focus groups were arranged for physicians (10 focus groups) and nurses (10 focus groups) to avoid bias owing to dominant participation and professional influence.¹⁷ All focus groups were of mixed sex and were fairly homogenous with respect to the age. Three focus groups were conducted by a different facilitator and were excluded, whereas the remaining 17 focus groups conducted by the same facilitator were included in the analysis. Each participant was provided with a modest incentive in the amount of US\$5 to compensate for time.

Data collection

An interview guide was developed collaboratively by study researchers from Vietnam and Australia during an in-country workshop. Questions were designed to cover key areas of interest,

including personal risk perceptions, perceptions of the importance and effectiveness of different infection control measures, current practices regarding the use of PPE (with a focus on facemask/respirator use), factors affecting compliance, and organizational practices and support around infection control practices. Before the workshops, an information sheet was provided and participants were asked to provide written informed consent. The focus group sessions ranged in duration from 60 to 90 minutes and were conducted in Vietnamese language. During the sessions, the moderator's interaction with the group consisted primarily of delivering the main open questions, ensuring that the discussions remained relevant to the aim of the study, and encouraging all participants' involvement in the discussions. Group sessions were digitally recorded and transcribed in Vietnamese using standard word processing software, then translated into English.

Analysis

Thematic analysis was carried out, and a group approach was taken to analyze transcripts to reduce bias and ensure data rigor. Initially, 2 investigators (A.A.C. and H.S.) developed a code list of themes after a preliminary analysis of one-quarter of the transcripts. An agreed-upon thematic framework (consisting of main issues related to facemask use) was then applied to another subsample of transcripts and modified further. Identical themes were grouped into 4 major thematic categories. Using this final framework, 1 researcher (A.A.C.) coded and analyzed all 17 transcripts. Coded text was organized within the identified themes of the developed framework. NVivo software (Pty Ltd. Version 10, 2012, QSR International, Melbourne, Australia) was used to facilitate data management and analysis. Themes were described, and variations in opinions were discussed. Anonymous quotes were narrated to describe the chosen themes.

RESULTS

Best protection method

Facemasks and respirators were considered an effective approach of preventing respiratory infections. Most participants described facemasks/respirators as the "only" and the "best protection" method available to protect HCWs from respiratory infections. Participants had mixed views on the level of protection afforded by the various types of products available, however. N95 respirators were considered the most effective, although most nurses emphasized that they had never used N95 respirators in their workplace, whereas some doctors remarked that N95 respirators were only available during emergencies. Both medical and cloth masks were described as being "comfortable" and "easy to breathe through." Medical masks were associated with being "safe," "effective," "airy," and "clean," whereas cloth masks were "soft" and "cheap." Some of the negative aspects associated with medical masks included that they are "expensive" and can be "saturated with sweat," whereas cloth masks are "difficult to tie" and "dirty." There is a perception that medical masks are of better quality than cloth masks, despite the fact that medical masks are not subject to regulatory standards in Vietnam.

"I think medical masks protect more than cloth masks because they are made according to medical standards" (physician).

Wearing multiple facemasks was reportedly a common practice among HCWs. Participants reported that wearing 2 or 3 medical masks together (on top of one another) is not unusual. However, this practice is dependent on the type and availability of facemasks

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