Healthcare Workers' Compliance with Infection Control and Prevention Recommendations for Respiratory Infectious Diseases; Systematic Review

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Abstract

Study aim: We reviewed the most recent research in this study to assess the effect of dissemination strategies on healthcare workers' adherence to workplace control and preventive guidelines for infectious diseases.

Method: This study was conducted in accordance with the PRISMA 2009 declaration. We searched the databases of Cochrane, Embase, and Medline for articles published between 2010 and 2015. We verified the references in the included publications' list of references and the references of pertinent systematic reviews. Only randomized controlled studies were searched. We concentrated on studies that assessed how distribution strategies affected healthcare workers' adherence to workplace control and preventive guidelines for communicable diseases of the respiratory system.

Result and conclusion: Six randomized controlled trials that focused on healthcare workers' HHC and preventive practices were included in this study. The WHO multimodal strategy for improving hand hygiene, meetings, educational materials, and vaccinations were the interventions put into practice. The two outcomes of interest are vaccination uptake and HHC. Vaccination uptake, HHC, and knowledge of prevention and control were the control and prevention adherence outcomes that were assessed for over 54393 healthcare workers in all categories. Compared to the control, the use of multimodal distribution techniques led to increased immunization rates and HHC among HCWs.

Keywords: Healthcare workers, infection, prevention, control, recommendations

Introduction

Programs that promote good hand hygiene have been shown to significantly reduce the prevalence of infections linked to healthcare in hospitals (1,2). Adherence to proper hand hygiene has been shown to reduce not just the rates of endemic infection but also the frequency of outbreaks and the rise of antibiotic-resistant organisms (1). The application of antiseptic hand rub with an alcohol basis is one of the key elements of these hand hygiene programs.It is faster, less time-consuming, and less likely to irritate hands than plain hand washing with soap and water or detergent to eradicate harmful bacteria(3).

Healthcare workers (HCWs) fail to adequately appreciate the need of hand hygiene, despite it being a basic activity. Studies have shown that up to 40% of people do not practice hand hygiene (4). Numerous factors, including the type of healthcare professional, the department, and the degree of contamination risk, are linked to low compliance (5).

While several prior studies have demonstrated the effectiveness of interventions aimed at raising hand hygiene compliance, none have resulted in a long-lasting improvement (4,6). The Centers for Disease Control and Prevention released guidelines on hand hygiene in healthcare settings in 2002 in an effort to address some of these issues. These guidelines encouraged the use of alcohol-based solutions and the adoption of multimodal and multidisciplinary approaches to increase hand hygiene compliance (7). The Alliance for Patient Safety was approved by the WHO in 2004. The WHO views good hand hygiene as the primary measure in halting the spread of disease agents in hospital environments (8).

The necessity for multimodal interventions was emphasized in the recommendations, which included important components including health staff education and motivation, the use of hydroalcoholic preparations, the use of compliance indicators, and the dedication of all health managers. These days, the WHO suggests a multimodal approach to improving hand hygiene that involves institutional safety environments, system reform, training and education, evaluation and feedback, and workplace reminders (9).

Because primary healthcare centers are changing significantly and implementing more sophisticated and invasive procedures than in the past—in fact, hospital stays are getting shorter and healthcare is increasingly provided in homes—hand hygiene is crucial in these settings. The risk of contracting and spreading illnesses linked to receiving medical care outside of a hospital is increased by all of these variables (10). Nevertheless, there is insufficient scientific proof that hand hygiene practices are followed in this context, despite the fact that formal documentation supporting the advocacy of hand hygiene procedures in primary care is rising (11,12).

In order to evaluate the impact of dissemination interventions on healthcare professionals' compliance with control and prevention recommendations for infectious illnesses at work, we evaluated the recent literature in this study.

Method

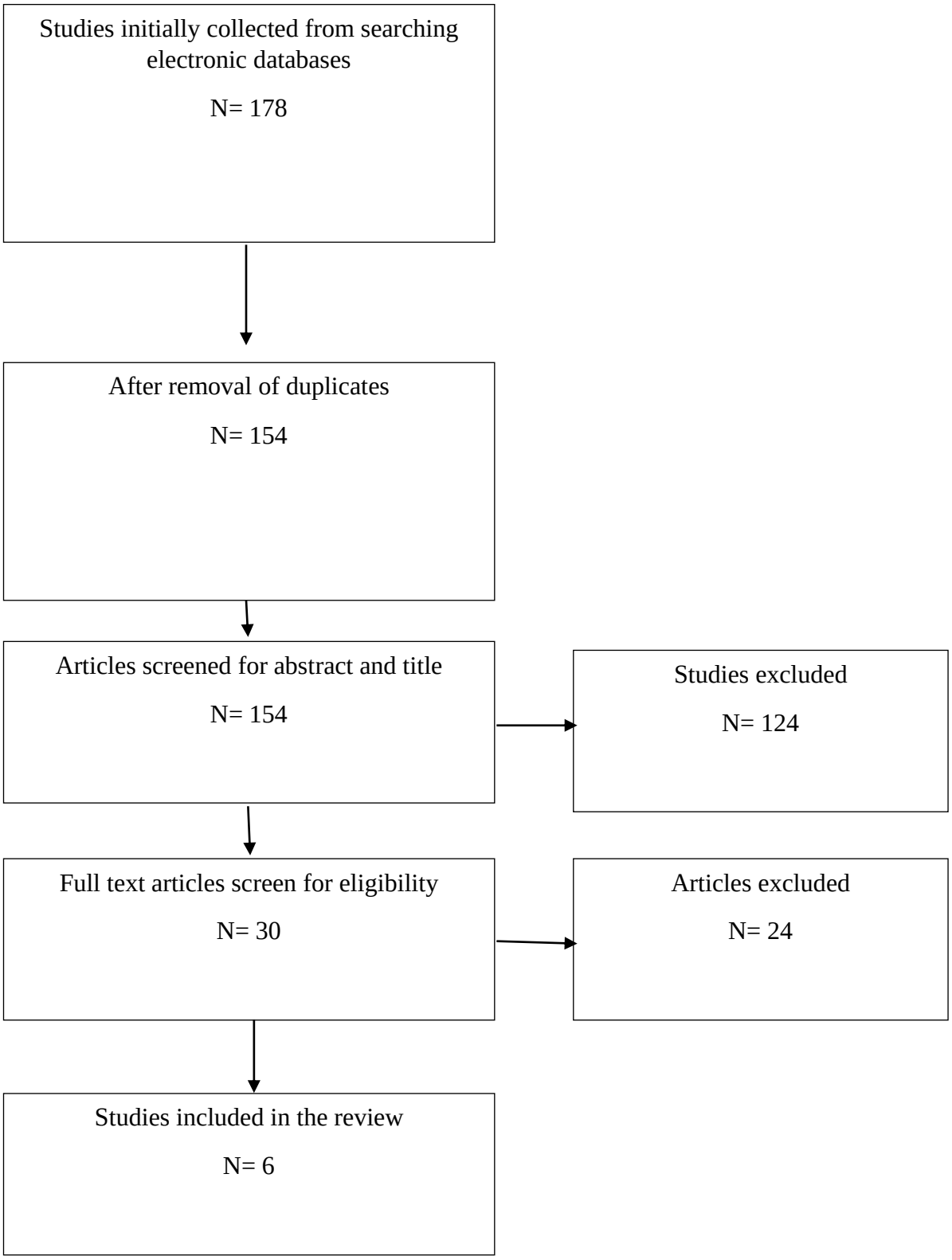
Preferred reporting items for systematic reviews and meta-analyses (PRISMA) statement2009 was followed in the conduct of this systematic review(13). We looked through the Cochrane, Embase, and Medline databases to find publications that were released between 2010 and 2015. We went through the list of references from the included articles and the references of relevant systematic reviews and vetted them. We did not apply any further restrictions and the searches was restricted toRCTs. Our focus was on articles that evaluated the impact of dissemination interventions on healthcare professionals' compliance with workplace control and prevention recommendations for infectious illnesses.

At Mendeley Software, the review authors worked in pairs and separately examined abstracts and titles. The group then convened to discuss differences and modify the selecting procedure. We reached compromise to

settle disputes. The full-text studies that met the eligibility requirements based on abstract and title screening were chosen using the same procedure.

Using a revised form, all authors extracted data, which the corresponding author cross-checked. The studies' reference, setting, inclusion criteria, study design, sponsorship source, participant characteristics, intervention descriptions, and major findings were gathered.

Fig 1: PRISMA consort chart of studies selection



Results and discussion

In this systematic review study we included 6 RCTs (Fig 1) targeted Healthcare workers Compliance with the prevention protocols and hand hygiene. Interventions implemented were WHO multimodal strategy for improvement of hand hygiene, Meetings, Educational materials, and vaccine. The outcome of interest include; hand hygiene compliance (HHC) and vaccination uptake.The following infection control and prevention adherence outcomes—vaccination uptake, HHC, and knowledge of infection prevention and control—were evaluated for over 54393 healthcare professionals across all categories. One research just included the options for hand hygiene; it did not specify the number of healthcare professionals evaluated(14). Characteristics of the included studies were presented in (Table 1).

The distribution of implementation techniques was based on educational interventions in five of the research(14–18). A modified version of the WHO multi-modal hand hygiene improvement strategy—which includes education, workplace reminders, observation and feedback, product and infrastructure provision for hand hygiene, and the development of a safety culture—was used in three studies that evaluated HHC(14–16,19). Two research (17,18)performed surveys and focus group sessions to personalize their distribution interventions. In one study (16), performance monitoring of healthcare delivery was used; in two other studies (14,16), audit and feedback were used. In one research, part of the intervention was making performance data publicly available (18).

The incidence of gastrointestinal, cutaneous, and soft-tissue infections as well as urinary tract infections did not significantly decrease, according to the Yeung et al. research. These results were consistent with other research conducted in hospitals, which shown that the use of alcohol-based antiseptic hand rub reduced the frequency of infections(1,2,20). In a similar vein, a recent research conducted in long-term care facilities (21) shown that the use of antimicrobial soap significantly reduced the overall incidence of infection. Yeung et al. found that following hand hygiene intervention, the risk of infection decreased. The total incidence of infection was shown to have risen in the control group, mostly due to an increase in the incidence of urinary tract infections and septicemia (15).

Past research has shown that the incidence of infection decreases according to the level of hand hygiene adherence. For instance, it has been shown that when hand hygiene adherence rose 1.5 to 2.8 times, the incidence of healthcare-associated infections decreased by 40% to 45%(1,2,20).There was a reported 64% drop in the incidence of healthcare-associated infections when hand hygiene adherence improved by more than three times(22). Significant differences between the treatment and control groups in specific months were not clearly evident, despite a considerable and significant decrease in the treatment group's cumulative total incidence of infection(15).

In order to promote flu vaccination, an active multicenter campaign that gave personal pleasure and took into consideration the profile of HCWs who were not vaccinated outperformed a scientifically correct information program, according to a research conducted in France by Rothan et al. on senior health care workers. HCW participation in program execution is necessary to prevent top-down information from being rejected. More research is required to determine the program's long-term effectiveness(18).

In the research by Mertz et al., the intervention group's rate of hand hygiene adherence was noticeably higher than that of the control group. The control group's rate of adherence increased from baseline, albeit the difference was not very significant. This could be because of a number of things, such as cross-contamination between groups, the Hawthorne effect, or the installation of alcohol-based hand rub dispensers throughout the hospital(14). Mertz et al.(14) used a cluster-randomized trial instead of randomly assigning health care workers (HCWs) in order to reduce the effects of contamination between the study groups. However, it is possible that information about the trial was disseminated to the control units, leading

to contamination between the groups. Because HCWs in the control group knew they were being watched, they may have increased their adherence (23,24), an effect that is predicted to diminish over time (25). Additionally, hand rub dispensers were installed after the baseline assessment but before the intervention began, which may have increased adherence rates in both groups (26).

Mertz et al. could not find a change in the rate of hospital-acquired MRSA colonization after screening patients every two weeks(14). Given the little variation in the rates of hand hygiene adherence between the groups, was not surprising. The results of Mertz et al. are consistent with studies indicating that a bigger relative increase in hand hygiene adherence is required to have an impact on the incidence of MRSA colonization, the higher the baseline hand hygiene adherence rate (27). Excluding suspected MRSA infection outbreaks and redefining hospital-acquired MRSA colonization as newly identified 5 or 10 days after admission instead of 3 days after admission did not alter the outcome of sensitivity analysis.
According to a recently released review (28) most observational research indicated a relationship between higher hand cleanliness rates and a lower incidence of illnesses linked to healthcare. Furthermore, the majority of research were limited to certain hospital units or the intensive care unit. In a research by MacDonald et al. (29), there was a decrease in MRSA colonization instances but no improvement in hand hygiene adherence rates. According to research by MacDonald et al.(29) and Mertz et al. (14)there are several other factors at play and there is no clear correlation between the rates of adherence to hand hygiene and MRSA colonization rates.

The introduction of alcohol handrub improved self-reported HHC, according to a prospective interventional study carried out in the United States; nonetheless, nosocomial infection rates remained unchanged (30). The care facilities were chosen for the Yeung group's clustered, RCT investigation using snowball sampling (15). Their participating facilities were a combination, with diverse sources of income, nurse staffing levels, and residents' impairment degrees (15). Their interventions, which included giving out alcohol handrub, providing reminder materials, and educating HCWs, were based on the WHO model (15). Their initial design did not include performance feedback, but due to a decline in HHC during the experiment, it was introduced midway through (15).

According to Martin et al.'s(19) results, a multimodal hand hygiene enhancement method raises HCWsHHC level by 21.6% when compared to the control group. These results aligned with those from many observational and experimental studies conducted without a control group, which demonstrate comparable levels of impact from educational interventions, with increases in HHC ranging from 18% to 41% (1,2). Recently, Erasmus et al. (31) discovered that the intervention increased HHC by 16.1% in a before-and-after study to examine the usability and indications for efficacy of using action plans among nurses in 2 hospital staff in order to improve hand hygiene. These findings are extremely similar to those reported by Martin et al(19).

Table 1: characteristics of included studies

Study	Study design	Study sample	Participants	Comparator	Interventions	Study	Outcomes
Ho et al. (16)	Cluster RCT	810	Healthcare workers (HCW) in contact with patients	Conventional activities	WHO multimodal strategy for improvement of hand hygiene	Health Protection Centre	HHC
Martin et al. (19)	Cluster RCT	170	Healthcare workers	Conventional activities	WHO multimodal strategy for improvement of hand hygiene	Spain Ministry of Health	HHC
Mertz et al. (14)	Cluster RCT		HCW in contact with patients	Conventional activities	WHO multimodal strategy for improvement of hand hygiene	National Service Foundation	HHC
Yeung et al. (15)	Cluster RCT	188	HCW in contact with patients	Conventional activities	WHO multimodal strategy for improvement of hand hygiene	University laboratories	HHC
Riphagen et al (17)	RCT	50,351	HCW in contact with patients	Conventional activities	Meetings, Educational materials, and vaccine	Organization for Health Development and Research	Vaccination uptake
Rothan et al. (18)	RCT	2874	HCW in contact with patients	Conventional activities	Meetings, Educational materials, and vaccine	None	Vaccination uptake

Conclusion

The adoption of multimodal distribution tactics resulted in higher vaccination rates and HHC among HCWs as compared to no intervention. The effect was little or nonexistent when contrasted with solitary diffusion tactics. It is important to do more research to evaluate the efficacy of individual treatments in comparison to standard procedures. The findings appear to support the employment of educational techniques in conjunction with non-educational dissemination techniques like audit and feedback. Dissemination tactics have the potential to limit the spread of respiratory infections among HCWs by increasing adherence to standards for their management.

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