What can the research evidence tell us about:

Effectiveness of Hand Hygiene Practices & Compliance, Against COVID-19: A Rapid Evidence Synthesis

[9 July 2020]

Key Message

- Even though hand hygiene undoubtedly reduces the spread of coronaviruses, the exact contribution & effectiveness of different strategies to improve hand hygiene compliance is not currently known.
- Compliance with proper hand washing at the recommended times might result in the reduction of COVID-19.
- At the communality setting, antimicrobial based soaps might not have a superior effect over other types of soaps.
- Multimodal interventions may improve the compliance of hand wash in health care facilities.

Summary of the review

- Evidence shows proper hand hygiene reduces risk of respiratory infections and influenza transmission in the community.
- There is no evidence that shows a superior effect of antimicrobial based soaps on disease incidence compared with hand washing with soaps
  - That is, antibacterial soap is not more effective in community-settings and under normal use conditions.
- Alcohol-based hand rub have been proved to be effective in the reduction of micro-organisms.
  - Alcohol-based hand rub (ABHR) is less effective if applied on wet hands.

Strategies to improve compliance to hand hygiene might be the following:

- Observation - considered to be the gold standard for assessing hand hygiene compliance; however, limitations exist.
- Hand hygiene monitoring technology - including electronic and video monitoring systems, have been developed as a potential solution to the problem of poor hand hygiene compliance among healthcare workers.
  - Interventions used to improve compliance to hand hygiene should be multi-faceted.

What is Rapid evidence Review?

Rapid evidence review addresses the needs of policymakers and managers for research evidence that has been appraised and contextualized to a specific context in a matter of hours or days. This rapid evidence review goes beyond research evidence and integrates multiple types and levels of evidence

Where did this Rapid Evidence Review come from?

This document was created in response to issues related about Effectiveness of Hand hygiene practices towards the prevention of COVID-19: Rapid Evidence Review. It was prepared by the Knowledge Translation Directorate, Ethiopian Public Health Institute.

Included:

- **Key findings** from research and **implementation considerations**

Not included:

- Recommendations
- Detailed descriptions

Rapid & Responsive Evidence Partnership (RREP)

Background

Corona virus Disease (COVID-19) primarily spreads through droplet and contact transmission. These droplets can land on objects and surfaces around a person such as tables, doorknobs and handrails. Contact transmission happens through touching these contaminated objects, surfaces or infected people. Thus, hands play a crucial role in transmission of COVID-19. This is why it is important to wash our hands regularly with soap and water or clean with alcohol-based hand rub (1,2).

According to World Health Organization (WHO) report, COVID-19 viruses can survive on surfaces 2 hours to 9 days, 72 hours on plastic and stainless steel, less than 4 hours on copper and less than 24 hours on cardboard. The type of surface, temperature, relative humidity and the strain of the virus can influence the survival time of COVID-19.(1,2,3,4)

Adding to this, poor hand hygiene practice among individuals in the community and health-care professional are strongly associated with the transmission of infections and a major factor in the spread of viral transmissions & other micro-organisms with in hospitals. Despite, the fact that the virus can stay on different surfaces for long and poor hygiene contributes to increased transmission (4,5,6)

Health systems with poor hand hygiene compliance need more resource to care for patient who have infections, many of whom must stay in hospitals for longer periods of time. Compliance to appropriate hand hygiene will help improve the health workers' ability to offer safe services, reduce their exposure and improves patients' confidence in health systems (7,8,9,10).

How this Rapid Evidence Review was prepared?

The methods used to prepare in this rapid evidence review were adopted from the SURE Rapid Response Service: www.evipnet.org/sure/rr/methods AND McMaster Health Forum, COVID-19 Evidence Network to support Decision-making, COVID-END https://www.mcmasterforum.org/networks/covid-end

In this review, we have searched for relevant evidences about the Effectiveness of Hand hygiene practices towards the prevention of COVID-19: Rapid Evidence Review. Our search was directed by the guide to COVID-19 evidence sources https://www.mcmasterforum.org/find-evidence/guide-to-covid-19-evidence-sources

Strategies to improve compliance to hand hygiene (community & health care facilities) were included in to the review as a means of improving hand hygiene compliance and reducing the transmission of microorganisms.

The WHO multimodal hand hygiene improvement strategy and its associated resources represent an evidence-based framework for developing a locally-adapted implementation plan for hand hygiene promotion (8,11). However, the exact contribution of hand hygiene to the reduction of direct and indirect spread of coronaviruses and the exact level of compliance needed between people is currently unknown. Taking this in to consideration, this rapid evidence review would be better to look at research evidences, supporting or against the current hand hygiene practices. More specifically, evidences about the effectiveness of hand hygiene against viruses, including COVID-19 and about the Compliances of hand hygiene by health workers and the community.

Methods

This rapid evidence synthesis focused on summarizing research evidences dealing with the effectiveness of hand hygiene and the compliance towards the prevention of viruses, including COVID-19. WHO, CDC guidelines and JBI evidence summaries on hand hygiene were also used. Searching of key terms like hand hygiene, WASH, COVID-19 , systematic review ,Rapid review, guideline, terms were used in the search process in Cochrane ,JBI, Macmaster health forum, Evidence aid ,SURE ,COVID-END & Google scholar.

More specifically our search focused on the following five issues:

1. Evidences about the effectiveness of hand hygiene against viruses, including COVID-19
    - Evidence about the effectiveness of different types of soap against COVID-19
    - Evidences about the effectiveness of using ash against COVID-19, where there is no soap.
    - Evidence about the effectiveness of Alcohol-Based-Hand-Rub against COVID-19.
2. Evidences about the Compliances of hand hygiene by health workers and the community.

The methodological quality of the included systematic reviews, rapid reviews were assessed based on AMSTAR guideline (12).When no relevant systematic reviews or rapid reviews were identified, guidelines that were developed using some type of evidence synthesis or an expert opinion and single studies (from published and grey literature) were used to summarize our findings. WHO and CDC guidelines about hand hygiene and JBI evidence summaries on hand hygiene practices were also included.

Review Findings

1. Evidence about the effectiveness of hand hygiene in preventing viral diseases, including Covid-19.

There were four systematic reviews about the effectiveness of hand hygiene interventions, both in health care & community settings. The available evidence are summarized on the efficacy of hand hygiene interventions in reducing influenza transmission, on the effectiveness of ash for removing or killing COVID-19 and the effectiveness of alcohol-based solutions for routine hand hygiene and surgical hand scrub in health care settings. Based on the available evidence, ash is not effective for removing or killing COVID-19 infections (high quality evidence) and alcohol based hand rubbing agents have been proved to be effective in the reduction of micro-organisms (medium quality evidence). Summary of the findings are indicated in table 1.(13,14,15,16)

Table 1: Evidence about the effectiveness of hand hygiene in preventing viral diseases, including Covid-19.

Type of document	Area of Focus	Key findings	Level of Evidence quality
systematic review and meta-analysis	-Evaluate the efficacy of hand hygiene interventions in reducing influenza transmission in the community - investigate the possible modifying effects of latitude, temperature and humidity on hand hygiene efficacy	• There was an insignificant relative risk reduction of 18% in the pooled analysis • a significant reduction of 27% was reported for the hand hygiene and facemask group • meta-regression model did not identified statistically significant effects of latitude, temperature or humidity on the efficacy of hand hygiene	**High-quality** (8/11)
Systematic review	-Review the available evidences on the effectiveness of hand hygiene in preventing laboratory-confirmed or possible influenza infection & transmission in the community settings	• The effectiveness of hand hygiene against influenza virus infection & transmission in the community setting is difficult to determine based on the available evidence • The systematic review identified 16 studies that assessed the impact of hand hygiene intervention or practice on influenza infection or transmission in the community setting. Two-thirds of studies suggested hand hygiene practices may help prevent influenza infection.	**medium quality** *(5/11)*

		• Most studies that looked at influenza transmission, however, had non-statistically significant results.	
Systematic Review	To assess the effectiveness of alcohol-based solutions for the for routine hand hygiene and surgical hand scrub hand hygiene in health care settings	• Alcohol-based hand rub removes microorganisms from hands of personnel more effectively, requires less time, and irritates hands less often than traditional hand washing with non-medicated Soap or other antiseptic agents and water. • The combination of 61% alcohol ethanol and 1% Chlorohexadine gluconate (CHG) is more effective in producing residual antibacterial properties on the skin	**medium quality** **(6/11)**
Rapid review	Assess the benefits and harms of hand cleaning with ash compared with hand cleaning using soap. Or Assessing the benefits & harms of hand cleaning with ash compared with other materials for reducing the spread of viral and bacterial infections.	√ Ash is not effective for removing or killing COVID-19. √ In settings where soap is really scarce, remind people that any type of soap is effective for hand washing. • √ There is limited evidence on the effectiveness of ash used for hand washing in the fight against COVID-19 but it is effective for other germs and may be better than hand washing with water alone.	**High-quality (8/11)**

Note: *AMSTAR rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality and has three levels (high quality = 8 to 11; medium quality = 4 to 7; and low quality = 0 to 3).*

1. Evidences about hand hygiene compliance towards the prevention of microorganisms in Community Settings & health care facilities.

Community and health facility based (HFB) compliance with hand hygiene is considered to be the primary measure to prevent the transmission of COVID-19. Changing the behaviour of communities and staffs in health care facilities, would be important to optimize the compliance with hand hygiene at the recommended moments. We found three systematic reviews and two evidence summary about the hand hygiene compliance at community level and health care facilities (17-21).

Table 2: Evidence about hand hygiene compliance towards the prevention of M.organisms in Community Settings & health care facilities.

Type of document	Area of Focus	Key findings	Level of Evidence quality
JBI Evidence Summary (Marin, T.2020)	Hand hygiene: monitoring technology	• Hand hygiene technologies (HHMT), including electronic and video monitoring systems (EMS/VMS) are resulted in improved compliance in washing hands in health care settings. • Increased from a mean of 73% in the eight weeks before installation, to 83% during the ten-week intervention period and returning to 73%, once the system was removed (measured over a period of four weeks) – the HHMT recorded compliance at 98% to 100% during the ten weeks. • HHMT may improve compliance through the provision of enhanced feedback, real-time reminders, or through an enhanced Hawthorne effect • 6.8% higher study-defined compliance in the intervention arm by an EMS providing individual feedback and real-time reminders.	**JBI Evidence Summary**
Systematic Review (community settings)	To identify, define and categorise the determinants of hand washing behaviour in domestic settings and to appraise the quality of this evidence	• Several determinants were under-represented (mentioned fewer than 10 times across the literature), such as the biological environment, contextual factors, routines, roles, capabilities, intention and motivations other than disgust, comfort, fear and nurture. • Strategies to improve compliance to hand hygiene (e.g. the introduction of, and accessibility to, alcohol-based hand rub; education; psychological theory; and quality improvement strategies) should be implemented; however, evidence is insufficient at this time to recommend which intervention, and what delivery method, is most effective. • Hygiene promotion programs are likely to be most successful if they use **multi-modal approaches**, combining infrastructural improvement with 'soft' hygiene promotion which addresses a range of determinants rather than just education about disease transmission.	**JBI Evidence Summary**
Systematic Review (health care settings)	To find out what strategies can improve healthcare workers' compliance with recommendations for hand hygiene, either hand washing	• Multimodal (combinations of) strategies that include some but not all strategies recommended by WHO may slightly improve hand hygiene compliance and slightly reduce infection rates (low certainty of evidence) • Multimodal interventions that contain all recommended strategies plus additional strategies may slightly improve hand hygiene compliance (low certainty of evidence).	**Medium quality (6/11)**

	with soap and water or using alcohol-based hand rub (ABHR), or both.	• Performance feedback may improve hand hygiene compliance (low certainty of evidence) and probably slightly reduces infection and colonisation rates (moderate certainty of evidence).	
JBI Evidence Summary (Marin, T,2020)	Hand Hygiene Compliance: Interventions in Healthcare Settings. The Joanna Briggs Institute EBP, Database, 2020	Strategies which can improve compliance to hand hygiene are: • Introduction of, and accessibility to, alcohol-based hand rub • Education & psychological theory; • quality improvement strategies • Interventions used to improve compliance o to hand hygiene should be multi-faceted.	**JBI Evidence Summary**
Systematic Review (health care settings)	The review summarises how effective are different approaches to promote hand washing and sanitation behaviour change; and what factors influence the implementation of these approaches?	• Community-based approaches to promote hand washing and sanitation efforts seem to work better than social marketing, messaging and interventions based on psychosocial theory. Programs combining hygiene and sanitation measures appear to have a larger impact than either one alone.	**High quality** (9/11)

Note: *AMSTAR rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality and has three levels (high quality = 8 to 11; medium quality = 4 to 7; and low quality = 0 to 3).*

Annex 1: Guidelines (22)

S.no	Guideline type	Description on Hand hygiene
1	WHO Guideline, A Guide to the implementation of the WHO multimodal hand hygiene improvement strategy,2009 (for patient safety)	• **Hand hygiene at recommended moments** exactly where care delivery takes place. This requires hand hygiene products; alcohol-based hand rub, if available should be accessible and as close as possible, with in arm rich, where patient care or treatment were taking place. • Availability of alcohol-Based hand rubs at the point of care is usually achieved through staff-carried hand rubs (pocket bottles, wall-mounted dispensers, containers affixed to the patient's bed or bedside table or to dressing or medicine trolleys that are taken in to the point of care.
2	CDC- Guidance for Healthcare Providers about Hand Hygiene and COVID-19. Hand Hygiene Recommendations	• Practicing hand hygiene, which includes the use of alcohol-based hand rub (ABHR) or hand washing, is a simple yet effective way to prevent the spread of pathogens and infections in healthcare settings. • CDC recommends using ABHR with greater than 60% ethanol or 70% isopropanol in healthcare settings. • Hands should be washed with soap and water for at least 20 seconds when visibly soiled, before eating, and after using the restroom. • Healthcare organizations that encounter severe shortages of ABHR (and have exhausted supply chain access to efficacious products) may consider local production of formulations
3	JBI Evidence Summary (Porritt, K... Evidence Summary. Hand Hygiene: Indications and General Principles in Primary,2015)	• **Clinical practice guidelines recommend five key moments for hand hygiene** that should be performed to prevent the transfer of microorganisms: 1) before direct contact with a patient, including aseptic procedures; 2) after direct contact with a patient; 3) immediately after exposure to body fluids or excretions; 4) after touching a patient's surroundings; and 5) immediately after glove removal
4	Who interim recommendation on obligatory hand-hygiene against transmission of covid-19	• Although awareness of the importance of hand hygiene in preventing infection with the COVID-19 virus is high, access to hand hygiene facilities that include alcohol-based hand rubs as well as soap and water is often suboptimal in the community and in health care facility settings, especially in low-and middle-income countries • When hand hygiene is provided free of charge and is made obligatory by public health authorities, acceptability and adherence to hand hygiene best practices are improved, including in public health emergencies of international concern. • Hand hygiene is the most effective single measure to reduce the spread of infections through multimodal strategies, including access to the appropriate supplies.

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22. Annex1:List of Guidelines on hand hygiene

This rapid review was prepared by

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Conflicts of interest

No conflicting of interest.

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