

Interventions to improve hand hygiene in community settings: A systematic review of theories, barriers and enablers, behavior change techniques, and hand hygiene station design features

Authors

Sridevi K. Prasad¹ 0000-0003-0457-9534

Jedidiah S. Snyder² 0000-0002-7688-4450

Erin LaFon²

Lilly A. O'Brien² 0009-0004-1987-3706

Hannah Rogers³ 0000-0002-9515-1439

Oliver Cumming^{4,5} 0000-0002-5074-8709

Joanna Esteves Mills⁵

Bruce Gordon⁵

Marlene Wolfe² 0000-0002-6476-0450

Matthew C. Freeman² 0000-0002-1517-2572

Bethany A. Caruso^{1*} 0000-0001-9738-9857

1 Hubert Department of Global Health, Rollins School of Public Health, Emory University, Atlanta, GA, USA; bcaruso@emory.edu (BAC); sridevi.prasad@emory.edu (SKP)

2 Gangarosa Department of Environmental Health, Rollins School of Public Health, Emory University, Atlanta, GA, USA; matthew.freeman@emory.edu (MCF); marlene.wolfe@emory.edu (MW) jedidiah.snyder@emory.edu (JSS); lilly.obrien@emory.edu (LAO); erin.lafon@emory.edu (EL)

3 Woodruff Health Sciences Center Library, Emory University, Atlanta, GA, USA; hannah.rogers@emory.edu (HR)

4 Department of Disease Control, London School of Hygiene and Tropical Medicine, London, UK; oliver.cumming@lshtm.ac.uk (OC)

5 Water, Sanitation, Hygiene and Health Unit, World Health Organization, Geneva, Switzerland; estevesj@who.int (JEM); gordonb@who.int (BG)

*Corresponding author: Bethany A. Caruso bcaruso@emory.edu

Emory University, Rollins School of Public Health, 1518 Clifton Rd, Atlanta, GA 30322

Supplementary Table 15: Variations in frequency and intensity of hand hygiene interventions

Study ID Country, Setting	Outcome of interest	Standard intervention	Intervention adaptation	Effectiveness*
Dreibelbis 2016 Bangladesh; Schools	Observed handwashing after toileting events	Handwashing station built first before hygiene education provision	Sequencing - Hygiene education provided at same time as handwashing station provision	Adaptation performed the same
Amon-Tanoh 2021 Côte d'Ivoire; Households	Observed handwashing with soap after toilet use	Handwashing station only	Intensity - Handwashing station combined with hygiene promotion activities (videos, Glo Germ demonstrations, posters)	Adaptation performed better
Biran 2020 Nigeria; Households	Observed handwashing with soap at key events (before eating or serving a meal, after defecation or latrine- use and after cleaning a child's bottom post- defecation)	Standard community-led total sanitation (CLTS)	Intensity – CLTS+, including additional discussions, skits, films, pledges, stickers, and report cards	Adaptation performed better
Freeman 2020 Kenya; Households	Households with a functional handwashing station	Standard program (THRIVE II) Training	Intensity - THRIVE II Training plus household visits from social workers and community health volunteers	Adaptation performed better
Nuhu 2019 Bangladesh; Households	Compliance with handwashing steps	Simple handwashing instructions	Intensity - Complex handwashing instructions	Adaptation performed the same
Sangalang 2021 Philippines; Schools	Handwashing practice score	WASH policy workshop for teachers and two health education sessions for students	Intensity - Medium-intensity (three 1-hr sessions) and high- intensity education sessions (four 1-hr sessions)	Adaptation performed worse

Notes: Grey highlights are adaptations that performed better; *Effectiveness is determined if authors reported that the intervention was effective at improving hand hygiene outcomes