



## POSTER COMPETITIONS

# Effectiveness of Digital Handwashing Intervention as a Breakthrough to Control COVID-19 and Transmissible Disease Outbreaks: A Meta-Analysis of Clinical Trials

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## Introduction

The unprepared global health community is severely impacted by the COVID-19 pandemic, which increases the urgency of reducing disease transmission. Handwashing is a protective behavior, but its practice is insufficient with current methods. Digital intervention is potentially efficient in promoting better handwashing not only in COVID-19 but also in other diseases.

## Objective

This review is aimed to explore the effectiveness of digital handwashing interventions for transmissible diseases.

## Method

Following PRISMA, we searched PubMed, Scopus, MEDLINE, Cochrane, EBSCOHost, Scopus, and Google Scholar, for clinical trials assessing handwashing behavior change utilizing digital intervention from inception up to November 2021. Critical appraisal was performed using Cochrane Risk of Bias Tool 2.0 and converted to AHRQ standards. We utilized inverse variance, random effects model for quantitative synthesis.

## Results

Four studies were included in this study. A significant handwashing frequency pooled mean difference (MD) of 0.71 [95%CI: 0.41-1.01,  $P < 0.00001$ ] towards the intervention group was obtained from this meta-analysis. The subgroup analysis done reported the highest influence of digital intervention in the

frequency of handwashing before eating snacks (MD 1.04 [95%CI: 1.01-1.07]), after sneezing or coughing (MD 0.97 [95%CI: 0.85-1.08]), and after being close to ill person (MD 0.90 [95%CI: 0.97-0.93]). All of the results were found significant ( $P < 0.0001$ ) and homogenous ( $I^2 < 40\%$ ), except for handwashing after coming into the house subgroup. Another parameter, the theory of planned behavior (TPB), which may influence behavioral changes also gave a significant mean difference of 0.90 [95%CI: 0.54-1.27,  $P < 0.0001$ ]. In addition, notable MDs were obtained in attitude changes of participants (MD 2.01 [95%CI: 0.86-3.15,  $P = 0.0006$ ] and subjective norms (MD 0.57 [95%CI: 0.35-0.79,  $P < 0.00001$ ]) components.

### Conclusion

The digital intervention significantly improves handwashing in terms of both frequencies and planned behavior, which leads to better transmission control. We recommend the possible widespread application of this intervention in facing the current pandemic and future outbreaks.

### Keywords

*COVID-19, Control, Digital, Outbreaks, Handwashing*