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Review

Applying psychological frameworks of behaviour change to improve healthcare worker hand hygiene: a systematic review

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SUMMARY

Background: Despite the importance of hand hygiene in preventing transmission of healthcare-associated infections, compliance rates are suboptimal. Hand hygiene is a complex behaviour and psychological frameworks are promising tools to influence healthcare worker (HCW) behaviour.

Aim: (i) To review the effectiveness of interventions based on psychological theories of behaviour change to improve HCW hand hygiene compliance; (ii) to determine which frameworks have been used to predict HCW hand hygiene compliance.

Methods: Multiple databases and reference lists of included studies were searched for studies that applied psychological theories to improve and/or predict HCW hand hygiene. All steps in selection, data extraction, and quality assessment were performed independently by two reviewers.

Findings: The search yielded 918 citations; seven met eligibility criteria. Four studies evaluated hand hygiene interventions based on psychological frameworks. Interventions were informed by goal setting, control theory, operant learning, positive reinforcement, change theory, the theory of planned behaviour, and the transtheoretical model. Three predictive studies employed the theory of planned behaviour, the transtheoretical model, and the theoretical domains framework. Interventions to improve hand hygiene adherence demonstrated efficacy but studies were at moderate to high risk of bias. For many studies, it was unclear how theories of behaviour change were used to inform the interventions. Predictive studies had mixed results.

Conclusion: Behaviour change theory is a promising tool for improving hand hygiene; however, these theories have not been extensively examined. Our review reveals a significant gap in the literature and indicates possible avenues for novel research.

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Introduction

Healthcare worker (HCW) hand hygiene compliance rates are known to be suboptimal, despite pressure from regulatory bodies worldwide to improve compliance and abundant evidence that hand hygiene prevents healthcare-associated infections (HCAIs).[1,2] Improvement strategies to date have largely focused on a multimodal approach, typically including provision of soap and water and/or alcohol-based hand rub (ABHR) at point of care, training and education, reminders, administrative support, and measurement of compliance rates.[2] However, achieving significant and sustained improvement has been challenging.[3]

Hand hygiene is increasingly recognized as a complex behaviour with numerous motivators and barriers.[2] Researchers have begun to focus on applying behavioural psychology to bring about improvement. Psychological frameworks have been shown to be effective tools in guiding behaviour change in a variety of settings, including HCW behaviour.[4]

The primary objective of this systematic review was to determine the effectiveness of interventions based on psychological frameworks to improve HCW hand hygiene compliance. The secondary objective was to determine which psychological frameworks/theories have been used to predict HCW hand hygiene compliance, including facilitating factors and barriers, as these may be used to design interventions in the future.

Methods

Search strategy

We searched MEDLINE, EMBASE, CINAHL, PsycINFO, The Joanna Briggs Institute, SocINDEX, and Cochrane Database of Systematic Reviews (CENTRAL) from database inception until June 5th, 2014. We also searched reference lists of included studies and relevant review articles for additional eligible studies. The search strategy was developed by a team of experienced librarians (Appendix A).

Eligibility criteria

Randomized controlled trials (RCTs), non-RCTs, time series, controlled before–after studies, and quasi-experimental studies (including uncontrolled before–after) were considered for inclusion if they applied a psychological theory to improve and/or predict HCW hand hygiene. Based on the guidance of the Medical Research Council that complex interventions involving behaviour should be grounded in theory, studies that did not explicitly name a psychological framework were excluded.[5] The study population had to consist of any HCW group (e.g. physicians, nurses, allied health practitioners, technicians) and could be conducted in any healthcare setting, including acute care and long-term care. Studies had to include hand hygiene compliance as an outcome but were excluded if self-reported hand hygiene compliance was the only outcome.

Only published, peer-reviewed studies were included; studies published solely in abstract form were excluded. Studies were excluded if they were not published in English or if they did not supply primary data.

Data extraction and quality assessment

The eligibility criteria were pilot-tested on a selection of studies and then all retrieved titles and abstracts were independently assessed by two reviewers (D.Y., D.P.H.). If the inclusion/exclusion criteria could not be adequately assessed, the full article was obtained and reviewed. Disagreements were resolved by a third reviewer (J.A.S.) when the primary reviewers could not reach consensus.

After piloting a data extraction form, two reviewers (D.Y., D.P.H.) independently assessed each included article and extracted information including study methodology, setting, interventions, and outcomes. Disagreements were resolved by a third reviewer (J.A.S.).

The risk of bias of each included study was assessed independently by two investigators (D.P.H., J.A.S.) using an internally developed resource, the Public Health Ontario MetaQAT tool, to guide the critical appraisal process.

Data synthesis

Summary tables of included studies were developed. Narrative synthesis was conducted based on the Economic and Social Research Council guidance report.[6] We also evaluated study quality in relation to the demonstrated efficacy of each psychological framework for each of the primary outcomes.

Results

The literature search yielded 918 citations, of which seven studies met eligibility criteria (Figure 1). Four studies addressed our primary objective by evaluating interventions based on psychological frameworks, and three predictive studies of hand hygiene behaviour met our secondary objective (Table I). It was not possible to perform meta-analysis due to heterogeneity in study design, intervention, and outcomes.

Studies of hand hygiene interventions based on psychological frameworks

Fuller *et al.* performed a three-year stepped wedge cluster RCT involving 60 wards [44 acute care units for the elderly (ACEs) and 16 intensive therapy units (ITUs)] across 16 hospitals in England and Wales that were already implementing the national multimodal hand hygiene programme.[7] Following a baseline period, hospitals were randomized into the intervention every two months. The first component of the intervention was based on goal-setting and control theories. In goal-setting theory, specific and challenging goals, in combination with clear feedback, are used to increase the frequency of a desired behaviour.[8] Control theory focuses on the role of feedback in reducing discrepancy between ideal and performed behaviours.[9] HCWs were encouraged to set goals and action plans to perform hand hygiene, and feedback was provided on their compliance. The second phase of the intervention was informed by operant learning theory, which emphasizes the importance of reinforcing desired behaviours.[10] HCWs were provided positive reinforcement in the form of praise or rewards for following recommended hand hygiene practices. The primary, secondary, and tertiary outcome measures were directly observed hand hygiene compliance, ABHR and soap

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