Improving hand hygiene behaviour of nurses using action planning: a pilot study in the intensive care unit and surgical ward

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**Summary**

Compliance with hand hygiene guidelines by hospital physicians and nurses is universally low and there is a need to apply powerful intervention methods from social sciences in order to improve compliance. One method is the formation of implementation intentions (or action planning) in which concrete ‘if then’ plans are formulated to link an environmental cue with performance of an intended behavioural action. This pilot study explored the practicality and effects of action planning on the hand hygiene behaviour (HHB) of nurses in an ICU and surgical ward of a university teaching hospital. A pre–post test design was used, and 17 nurses were invited to participate. A trained researcher observed HHB of nurses before and three weeks after the intervention in which action plans were formulated. Frequencies were calculated and logistic regression analysis was performed to assess changes in HHB. Of the 17 participants, 10 (seven in surgical ward, three in ICU) had complete data and were included in the analyses. In total, 283 potential moments for hand hygiene were identified, 142 in the surgical ward and 141 in the ICU. HHB increased from 9.3% at baseline to 25.4% post intervention (odds ratio: 3.3; confidence interval: 1.7–6.5; \( P < 0.001 \)). Although this was a small scale study, the results show promise for the use of action planning to improve the HHB of nurses in the short term. Action planning has shown success in closing the intention–behaviour gap in other fields, and its use for improving HHB in healthcare should be further investigated.

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**Introduction**

Compliance with hand hygiene guidelines by hospital physicians and nurses is universally low, even though hand hygiene is considered the most important measure in the prevention of healthcare-associated infections.\(^1\)–\(^5\) Over the past decades various campaigns promoting hand hygiene among caregivers have been launched, but substantial and lasting effects on compliance rates have hardly been reported.\(^6\) To improve this situation, the need to apply research and intervention methods from the social sciences is increasingly recognised.\(^7\)–\(^9\) One of the reasons for low hand hygiene compliance is not that caregivers do not have the intention to perform hand hygiene, but that they often fail to act according to this intention. One type of intervention developed in social psychological research, specifically for addressing this discrepancy between intention and behaviour, is the application of action planning (or implementation intentions), often used in behaviours where there is little congruity between intended and performed behaviour.\(^10\) This applies to hand hygiene behaviour (HHB) since several studies have shown that most healthcare workers have positive intentions towards hand hygiene, even though their compliance in practice is usually low.\(^11,12\)

Implementation intentions are specific action plans, defining where and when to perform a particular behavioural action in order to achieve an intended goal.\(^13\) Action plans take the form of ‘if then’ plans (if situation X occurs, I will perform behaviour Z in order to achieve goal Y) and thus link situational cues (i.e. wound care) with a behavioural response (i.e. perform hand hygiene) that suits the desired outcome (prevent infection). These ‘if then’ plans assist in translating intentions into actions and have shown promising results in promoting health behaviours such as physical activity, dietary intake and participation in

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screening activities. Action planning can also be applied to other settings and behaviours; it can help healthcare workers to plan how and when they will perform hand hygiene in agreement with protocols, and how they could overcome barriers they might encounter in everyday practice. This could help to overcome the intention–behaviour gap, leading to proper hand hygiene in practice. It has, however, never been tested whether action plans could be effectively applied to stimulate HHB in a healthcare setting. This pilot study sought to explore the usability and indications for efficacy of using action plans among nurses in the ICU and surgical ward in order to improve HHB.

Methods

A before-and-after study was conducted from March to August 2008 in an intensive care unit (ICU) and a surgical ward of a university teaching hospital to explore the practicality of action planning among nurses as an intervention to improve hand hygiene compliance.

Participants, procedure and measurement

Study participants were recruited from nurses working on the days on which data collection was planned in each ward. A trained observer randomly selected nine nurses from the surgical ward and eight from the ICU for observation. The study was introduced as a general patient safety study and nurses were not aware that hand hygiene was the focus of study. All observations were collected between 08:00 and 11:00 and each nurse was observed for a period of 30 min. The HHB of the selected nurses was measured unobtrusively before and three weeks after the intervention, using a previously developed Personal Digital Assistant (PDA)-based observation tool. This tool, adapted from the Hand Hygiene Observation Instrument, scores HHB according to World Health Organization guidelines on healthcare indications for hand hygiene. See Figure 1 for a schematic overview of the study design.

One week after the first observations, each nurse who had been observed was invited to participate in an interview (the intervention) with one of the researchers who was not involved in any observational data collection (M.N.K.). All nurses who were interviewed were included in the second observation round, conducted at least three weeks after the intervention.

Intervention

The intervention consisted of a structured interview about the importance of hand hygiene, rated self-compliance, preferred method of hand hygiene and possible barriers encountered in daily practice, after which action plans (implementation intentions) for performing hand hygiene were made. Each interview lasted about 30 min. For the action planning component, participants were free to choose a specific healthcare situation, for example wound care, and were then encouraged to form action plans for this situation (see Box 1 for an example). Participants were first asked to make a step-by-step plan of how they usually work in the specific situation. They were then instructed to make a more specific plan defining when, where and how they would perform specific actions conducive to appropriate HH. In addition to action planning, they also had to anticipate and plan alternatives for moments when things are likely to go wrong (coping planning) (Box 1). However, no feedback was given as to the correctness and quality of the formulated action plans.

Data analysis

Hand hygiene compliance rates (frequencies) were calculated. One-way analysis of variance and logistic regression analysis was performed using SPSS 17, to test differences in HHB between baseline and follow-up.

Results

During the intervention period, interviews in which action plans were formed were held with seven nurses from the surgical ward, and six from the ICU (Figure 1). In total, seven nurses were lost to follow-up due to holidays, pregnancy leave and lengthy absence.

Box 1.

Formulating action plans (implementation intentions):
1. Choose a specific situation (i.e. wound care) and describe how you go about this task.
2. During this task:
   (a) When will you perform hand hygiene?
      Before you touch the patient, after removing dirty bandages and after you have cleared everything up.
   (b) Where will you do this?
      In the patient room.
   (c) How will you do it?
      I always use alcohol-based hand rub, I don't like to wash my hands with soap and water.
   (d) Who will be involved?
      Me.

Formulated action plan:
- I will pay extra attention to making sure that I have everything I need before I put on my gloves, so that I don't have to leave the patient after I have already touched the wound.
due to illness. It was possible to observe 10 participants post intervention: seven from the surgical ward and three from the ICU.

**Action planning**

The topics chosen during the action planning interviews were wound care (eight nurses), after glove removal (one nurse) and after leaving the patient’s room (one nurse).

**Observations**

Only the pre- and post-intervention data collected from nurses who participated in the intervention were included in the analysis (N = 10). During the study we collected 142 observations for potential hand hygiene opportunities in the surgical ward, and 141 in the ICU. Hand hygiene compliance rates increased from 9.3% at baseline to 25.4% post intervention (P < 0.001). Hand hygiene compliance in the surgical ward improved from 7.8% to 33.8% (P = 0.001), and in the ICU from 10.7% to 15.8% (P < 0.05) (Table I). Logistic regression analysis showed that nurses were 3.3 times more likely to perform hand hygiene [odds ratio (OR): 3.3; confidence interval (CI): 1.7–6.5] after the intervention. There were no significant effects for unit type on compliance (OR: 0.48; CI: 0.8–3.1).

**Discussion**

The results of this pilot study indicate that interviews including action planning could be useful in improving the HHB of individual nurses. The nurses were able to plan how they would fit proper hand hygiene into their routine, and post-intervention results indicate some success in implementing these plans. This is promising, because although most healthcare workers have positive intentions to comply with hand hygiene guidelines, in practice they often fail to do so.1

One of the limitations of our study was the small number of participants and short time span between intervention and follow-up (three weeks). Furthermore, baseline compliance in participating wards was extremely low, and it is not inconceivable that any kind of attention to hand hygiene could have yielded an effect, although other studies have shown similarly low levels of compliance.17–19 Our study was conducted in one university hospital, limiting generalisation of our results. Further research in different hospital types, more participants and a longer follow-up period are needed to justify large scale application of the intervention. Finally, action plans were formulated within a broader interview setting with other topics, and so effects may be due to the combined intervention and not to action planning only. Research is needed where action plans are formulated without other topics to exclude possible confounding. The simple pre–post test design does not allow us to ascribe the effects of the intervention with great certainty.

This study showed that it is feasible to use action planning as a change strategy, and that this approach may be effective. However, the application of action planning using the individual interview method is difficult in healthcare settings due to shifts. Individual face-to-face interviews are time-consuming and expensive as well as difficult to plan. Alternative applications of action plans through group sessions or web-based programmes should therefore be further investigated, as should their use with physicians, as it is still unclear how effective action planning might be with them.

Action planning can potentially help bridge the intention–behaviour gap, leading to improved compliance in practice. Furthermore, formulation of action plans helps to identify possible barriers and how one might deal with them.14 This process, also referred to as coping planning, may be particularly important for planning behaviour in difficult situations. Studies have shown that healthcare workers often have positive intentions to comply with hand hygiene guidelines, although this may not translate into actual compliance. Action planning may therefore be an essential addition to existing tools for compliance improvement. It must be noted, however, that action planning is only likely to work when people have positive intentions, indicating that it may have to be combined with other motivational interventions.10,15

In our study we saw a shift in compliance from 10% to 25%, but this is still far too low. Although action planning is likely to improve compliance with hand hygiene protocols, it is unlikely to have sufficient effect as a single intervention; multiple component interventions addressing individual, social, environmental and planning variables are needed to substantially improve hand hygiene. Studies have shown that attention should be paid to changes in the social and physical environment, training and education.1,16,20 Action planning can be a useful and unique component in this package, since it specifically aims to overcome the intention–behaviour gap and to lead to greater hand hygiene compliance in practice.

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**Conflict of interest statement**

None declared.

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