Major article

Using psychological theory to understand the challenges facing staff delivering a ward-led intervention to increase hand hygiene behavior: A qualitative study

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Background: The Feedback Intervention Trial was a national trial of an intervention to increase hand hygiene behavior in English and Welsh hospitals. It significantly improved behavior, the effect increasing with fidelity to intervention, but the intervention proved more difficult to implement than anticipated. This study aimed to identify the barriers to and facilitators of implementation as experienced by those who delivered the intervention.

Methods: Semistructured interviews were conducted with 17 intervention ward coordinators implementing the intervention. Interview questions were based on the Theoretical Domains Framework. Text relating to each domain was scored according to whether it indicated low or high likelihood of implementation, and thematic analysis conducted.

Results: The lowest scoring domains were "environmental context and resources," "beliefs about capabilities," "social influences," and "emotion." Lack of time and understaffing, perceived negativity from other staff members, and stress were identified as challenges to implementation. The highest scoring domains were "behavioral regulation," "motivation," "skills," "knowledge," and "professional role." Ward coordinators reported that they had the skills, understanding, and motivation to implement the intervention and spoke of consistency of tasks with existing roles.

Conclusion: Implementation might be improved by giving designated time for intervention tasks and ensuring that the ward coordinator role is allocated to staff for whom tasks are commensurate with existing professional roles.

Reduction in health care-associated infections remains a high priority across the world.[1] Achieving this through sustained improvements in hand hygiene formed the basis of the first Global Patient Safety Challenge.[2] Compliance with good hand hygiene behaviors (HHBs) in health professionals nonetheless remains poor, with levels of 25% to 40% being common.[3] Achieving and sustaining change is difficult as systematic reviews of interventions to increase HHB have shown.[4]

In a recent stepped wedge cluster randomized controlled trial over 3 years (the Feedback Intervention Trial [FIT]), we used 2 psychological theories—Control Theory[5] and Goal-setting Theory[6]—to design a feedback intervention to improve HHBs in 16 intensive therapy units (ITU) and 44 acute care of the elderly patients wards (ACE) across 16 National Health Service trusts in England and Wales.[7] The intervention was delivered by a member of staff (the ward coordinator) and consisted of a monthly recurring cycle of weekly 20-minute observations of individual staff member and overall ward HHB observations, verbally delivered feedback, and personalized goal setting and action planning. Intention to treat, per protocol, and fidelity to intervention analyses showed

that the intervention produced moderate but significant sustained improvements in hand hygiene compliance. Although all wards were randomized to receive the intervention, only two thirds of the ITUs (11/16) and half of the ACE wards (22/44) actually went on to implement the intervention, and, even within these wards, implementation was often delayed and fidelity to the intervention varied. A greater understanding of the experiences of those who delivered the intervention is needed because this may provide insight into problems of implementation and how these might be remedied.

Implementation of interventions to change health care workers' behavior is challenging[8] and may be influenced by contextual factors (eg, time, workload, and staffing),[9] attributes of the intervention (eg, clarity of instructions for delivery),[10] and psychological factors (eg, motivation, memory, and attention).[11] Theories of behavior change describe the processes by which behavior occurs and offer insight into how best to change it. The Theoretical Domains Framework (TDF), based on theories of behavior change, has recently been validated as an integrative framework to help understand the process of implementation[12,13] and has been used to investigate a wide variety of problems implementing clinical guidelines.[14]

Although the FIT trial showed that the intervention resulted in moderate significant and sustained increases in hand hygiene compliance, we concluded that further studies were required, including an analysis of implementation difficulties, before the FIT intervention could be recommended for routine clinical use. In this study, we used the TDF to understand challenges to implementation of FIT as experienced by those who delivered the intervention.

METHODS

Design

Semistructured interviews were conducted during a stepped wedge cluster randomized controlled trial between October 1, 2006, and September 30, 2009.

Setting and participants

We invited ward coordinators in all 33 implementing wards across 16 NHS hospitals in England and Wales for interview. Participants were contacted by telephone, provided with verbal information regarding the study, and invited to take part. Seventeen agreed: 10 from ACE wards and 7 from ITU across 11 hospitals. All participants were female and were either infection control link nurses (n = 15) or junior ward sisters (n = 2).

TDF interview questions

The pressure of time on ward coordinators meant that the study interviews had to be of short duration. Although all 12 TDF domains were relevant, consensus was reached among the study team that 3 were less so: "memory, attention, and decision processes"; "beliefs about consequences"; and "nature of the behavior." It was decided to develop the interview guide based on the remaining 9 domains. The study team agreed that it was likely that issues regarding the excluded domains would be captured through participants' responses to the other domains. For example, problems of memory might be reported through examining environmental context and resources, eg, forgetfulness as a result of overwork. An interview guide was designed based on the 9 remaining TDF domains (available from the authors): "knowledge," "skills," "social/

professional role," "beliefs about capabilities," "motivation and goals," "environmental context/resources," "social influences," "emotion," and "behavioral regulation." Questions were designed to explore the relevance of the 9 domains for implementation of the FIT intervention. Interview questions were designed by J.M. and S.M. and were based on exemplar questions for use with the TDF.[12] Interview questions were piloted with a ward coordinator at one of the trial's pilot sites to assess comprehensibility, practicability, and acceptability.

Procedure

Ethical approval was received from the multicenter Research Ethics Committee (Scotland B) (05/MRE10/2). Interviews were face-to-face or by telephone depending on location, lasted between 15 and 30 minutes, and were audio recorded and transcribed.

Analysis

Transcripts were content analyzed using an established method for analyzing data gathered using the TDF.[15] The total text related to each domain was allocated a score of 1, .5, or 0 depending on whether there was good, partial, or no evidence that it indicated likelihood of successful implementation. For example, if the rater judged the text related to environmental resources as evidence that the participant had the necessary resources to implement the intervention, they assigned a score of 1 for that domain. An implementation score was then calculated for each domain across wards by adding scores for that domain across participants. The highest possible score for each domain was 17, ie, the number of participants. Low scoring domains indicated low likelihood of successful implementation in relation to those domains, whereas high scoring indicated greater likelihood. Two researchers discussed and agreed upon definitions of domains to ensure consistency throughout the coding process. Reliability was assessed by inter-rater agreement (percentage agreement and κ), based on the independent scoring of 60 transcript excerpts. Inter-rater agreement, based on independent scoring of 60 transcript excerpts was 87% (52/60 domain-linked text excerpts); κ = .80. Disagreements were easily resolved by discussion between raters.

Thematic analysis was used to examine transcript excerpts for each domain.[16] This approach was used to identify themes within each domain. A third researcher reviewed the data, and consensus was reached about its interpretation.

RESULTS

Table 1 presents implementation scores, themes, and illustrative excerpts for each theoretical domain. The lower scoring domains and those indicating low likelihood of successful implementation of FIT were "environmental context and resources" (3.5), "beliefs about capabilities" (7.5), "social influences" (8), and "emotion" (8.5). The lowest scoring domain was "environmental resources." Two specific challenges to implementation were identified: "lack of time" and "understaffing." Ward coordinators described difficulties finding time to implement FIT within the context of existing routines and increased clinical workload because of staffing issues. In these instances, implementing FIT became a low priority. Ward coordinators stated that, whereas they felt equipped to deliver the intervention, they had concerns about their capabilities to do so within the context of available time and staffing. Perceived negativity from other members of staff as a consequence of assuming the role of ward

Table 1
Implementation scores, themes, and illustrative excerpts

Theoretical domain	IS*	Theme	Illustrative excerpt
Environmental context and resources	3.5	Difficulties finding time to implement FIT within the context of everyday clinical working routines. Impact of staffing levels on delivery, in that low levels of staffing meant increased clinical workload.	"I don't always get it [the intervention] done every week because *we don't have the time*" [. . .] "*It's not always easy depending on the staffing levels on the ward. Obviously, if you've got a lot off sick or on annual leave or whatever, the numbers are short, it's not always possible, so there are times when I don't fall behind, but find it difficult to do.*" Ward coordinator 16
Beliefs about capabilities	7.5	Concerns regarding capabilities to implement the intervention within the context of available time and staffing.	"The *difficulty is not actually doing the observation [part of the intervention], it's actually trying to go and write it down, having the time to go and set yourself aside to go and write it down, and then go and talk to somebody about it [ie, provide feedback]*" Ward coordinator 15
Social influences	8	Perceived negativity from other members of staff as a consequence of assuming the role of ward coordinator.	"I did find sometimes [as a consequence of delivering the intervention], *people in groups was like against me* [. . .] they *try to find another problem of me and go talk to the manager* regarding that, oh [name deleted] is doing that, [name deleted] . . . because I pick them up on their problem they're going to talk to the manager" Ward coordinator 8
Emotion	8.5	Contributes stress	"*I've felt stressed in terms of, I've got to get it done and, you know, the clock's ticking and I've got other things to do*" Ward coordinator 5
Behavioral regulation	12.5	Ability to prioritize, and organize goals	"*I've got to prioritise [in order to meet workload demands], and even though I'm very keen to, you know, carry out, you know, do these observations and everything [ie, the intervention], obviously some times other things take over.*" Ward coordinator 16
Motivation	13	Motivated to deliver the intervention	"*I'm really very passionate about this particular thing [the intervention] that we're doing, so I'm really striving to do it.*" Ward coordinator 14
Skills	13.5	Possess skills to implement the intervention but often hampered by contextual circumstances.	"*The actual carrying-out of it [. . .] I don't have a problem with the process [of delivering the intervention]. The problem I have is the opportunities as they arise, because when I'm out on the unit like I was today, I'm trying to observe a doctor who is fairly mobile, who moves from one end of the unit to the other, and as I'm trying to discreetly follow, people keep stopping me and asking me, can you check this? Can you [do] that?*" Ward coordinator 3
Knowledge	14	Good understanding of the intervention.	"*Well the first week [of the intervention] is staff within the unit and is just, there's three of us here and we just actually watch, unobtrusive to see whether staff are carrying the normal practices of washing their hands. The second week is any other medical staff [. . .] anybody that would come to the unit. The third week then is medical staff, in groups, and then the fourth week is we relay everything back [provide feedback] and see where we can improve things.*" Ward coordinator 1
Social or professional role and identity	15	Tasks conducted as ward coordinator are part of existing role.	"I don't mind [having the role of ward coordinator]. I see it, because I'm the infection control link nurse, so *I see it as part of that role* really, hand hygiene. So if I wasn't doing it through the FIT study, I would have to be doing it through what they used to do, the Lewisham handwashing tool. [. . .] *It's all part and parcel of my link nurse role anyway* [. . .] Yes, I do think it's appropriate because, as I say, we do have to monitor hand hygiene anyway." Ward coordinator 5

IS, implementation score.
NOTE. Particularly salient text is italicized.
*Implementation score: out of 17 (Low scoring indicates low likelihood of successful implementation in relation to those domains, whereas high scoring indicates greater likelihood.).

coordinator was described. This was often felt as a consequence of observing and providing feedback to colleagues. Ward coordinators reported that delivering the intervention contributed to feelings of stress, through adding an additional task on top of an existing workload. The higher scoring domains and those indicating greater likelihood of successful implementation of FIT were "behavioral regulation" (12.5), "motivation" (13), "skills" (13.5), "knowledge" (14), and "professional role" (15). Participants were motivated to deliver the intervention, reported that they had the skills to implement the intervention, understood the intervention, and perceived that tasks conducted as ward coordinator were part of existing professional roles.

DISCUSSION

The main findings of the study were that the domains most likely to explain poor implementation were "environmental context and resources," "beliefs about capabilities," "social influences," and "emotion". Thematic analysis identified specific barriers as lack of time and understaffing, perceived negativity from other members of staff as a result of performing ward coordinator duties, and stress as a result of delivering the intervention. Facilitators of implementation included having the skills, understanding, and motivation to implement the intervention and perceiving that tasks conducted as ward coordinator were part of their existing professional role.

The strength of this study is that it uses a validated integrative framework, based on theories of behavior change, the TDF, to help understand the process of implementation. This study is the first to the authors' knowledge to investigate theoretical explanations for implementation of a hand hygiene intervention within the context of a randomized controlled trial. The study has 3 main limitations. First, the pressure of time on staff meant that the study interviews had to be brief. In many cases, this precluded the possibility of examining specific components of intervention implementation in depth. The FIT intervention had multiple components: observation, delivery of feedback, personalized goal setting, and action planning. However, the question "Would it be easy for you to deliver the intervention?" was used without follow-up questions such as "Would it be easy for you to establish a ward meeting in which to deliver feedback on observed group compliance with hand hygiene?" Additionally, the original TDF consists of 12 domains. The need for brevity resulted in the removal of 3 of the domains considered less relevant to implementation of the intervention: "memory, attention, and decision processes"; "beliefs about consequences"; and "nature of the behavior." It may be that research resourced at a level that would allow full, intensive, and longer participant observation and interviews spread over time would provide additional or different data. Second, the TDF method itself depends on self-report. Observation would provide an additional source of data to complement this approach. Third, findings from the study may have been strengthened by interviewing additional ward coordinators, on wards where the intervention was being led by more than 1 person.

Thematic analysis revealed 2 environmental context and resource constraints as potential challenges to implementation: lack of time and understaffing. This is consistent with previous research examining the difficulties of implementing behavioral interventions in health care contexts.[9] Although delivery time was estimated at 20 minutes per week, our findings suggest that even this can pose difficulties for a busy health care setting. This raises the question as to whether, given the importance of hand hygiene for patient safety, there should be ring-fenced time for the intervention as an institutional priority.

Ward coordinators reported a perceived negativity directed at them from other members of staff in relation to the duties allocated to them. This may be understood in terms of Self-Categorization Theory,[17] which would predict negative consequences for those assuming unusual roles within a social group such as offering peer-to-peer or peer-to-senior feedback. This would not be the norm for a group of staff working on a ward together. Social identity theory[18] also suggests that behaviors incompatible with group memberships are unlikely to be performed. One solution to this may be to arrange for feedback to be given by someone in authority within the ward, who already has an existing role in feedback or appraisal, such as the ward manager or lead nurse.

Ward coordinators reported stress as a result of delivering the intervention either because of time and staffing constraints. These findings emphasize the importance of considering whether implementing interventions to improve health professional behaviors may create problems for those delivering them, thus undermining implementation. Consideration should be given in future trials to monitoring implementation and collecting data to describe, explain, and ultimately address problems of implementation such as this.

Knowledge and skills were the domains with highest scores, suggesting that these may have facilitated implementation of the FIT intervention. This may reflect the training ward coordinators received.[7] Additionally, ward coordinators stated that they were generally able to prioritize goals in relation to the FIT intervention and their workload demands. This did not always work in favor of the intervention, with more "important" goals related to ward duties assigned from ward managers or other members of staff often taking priority, especially when time or staffing were short.

CONCLUSION

In conclusion, this study has demonstrated how the TDF can be used to understand challenges to implementation experienced by those delivering a hand hygiene intervention designed using behavioral theory. The FIT intervention is the only hand hygiene intervention shown to be effective in acute hospitals in a large-scale, randomized, controlled trial. Its effectiveness is related to its implementation.[7] The findings of this study suggest that implementation, and therefore the effectiveness of the intervention, may be increased if hospitals, as part of their clinical governance and patient safety frameworks, gave ring-fenced time to staff for whom tasks are commensurate with existing professional roles. Although this remains to be proven by a further study, hospitals keen to improve their hand hygiene compliance by supplementing their current audit and appraisal systems with the FIT intervention should consider the findings of this study to maximize its implementation and effect.

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