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Discrepancy between self-reported and observed hand hygiene behaviour in health care professionals.

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Summary

Hand hygiene behaviour in 71 healthcare professionals was observed on hospital wards for a total of 132 hours and 1,284 hand hygiene opportunities. Questionnaires completed by the participants were used to compare actual behaviours with self-reports of behaviour, as well as intentions and attitudes towards hand hygiene. Observed practice showed very poor rates of adherence to guidelines and indicated that staff failed to take account of risk, even with patients colonised with MRSA. Observed practice was unrelated to carers' intentions and self-reports of behaviour. The results suggest that hand-hygiene interventions that target changes in attitudes, intentions or self-reported practice are likely to fail in terms of changing behaviour and consideration is given to how this could be remedied. (118 words)

Introduction

The U.K. Health Department guidelines state that hands should be washed "before and after contact with each patient" [1]. This study examines practitioners' adherence to this guideline, particularly taking note of practice when working with patients colonised with methicillin-resistant *Staphylococcus aureus* (MRSA) patients. It also examines whether observed hand hygiene behaviour on wards is consistent with health professionals' self-reports of their actions.

Research suggests that healthcare professionals clean their hands much less often than they say they do[2]. Understanding the link between self-reported and observed behaviours is of major importance in hand hygiene, but previous research has not concentrated on this. If there is no association, then interventions designed to improve intentions or self-reported

behaviours will not be effective in changing practice. One American study[3] reported a correlation of only 0.21 between self reports and actions, yet the study used a self-report averaging method likely to inflate correlations between self-report and observed practice, suggesting that the actual correlation may be even less than that reported.

This study examines the link between what carers say and what they do on two medical and two surgical wards linked by similar speciality and layout. In the setting for the study handwashing facilities are readily available and ergonomically sited. At each sink four different products are available: chlorhexidine gluconate, povidone iodine, liquid soap and alcohol gel. Alcohol gel is also present at every bedside.

Method

Observations were made on wards over a total period of 132 hours during which 1,284 opportunities for hand hygiene occurred. An opportunity for hand hygiene was defined as any occasion when a participant performed any activity which required hand hygiene, including contact with the patient, equipment, medication, food or prior to carers going on their break. Observations were made by two experienced observers: an infection control professional and a psychologist. Inter-rater reliability was established through both observers making the same observations for two days on four wards (kappa = 0.9, range 0.75-1.00). Seventy-one health care professionals (doctors, qualified nurses including 'permanent' agency/bank nurses, therapists and healthcare assistants) were observed. In order to minimise effects of observational error, 51 of the health care professionals (72%) were observed on at least four occasions. Sampling of care activities and participants was

opportunistic and included observations on the ward, at the bedside (behind curtains) and in sluice and treatment rooms. Observations ranged from the performance of simple, non-invasive procedures, e.g. taking and recording vital signs, to invasive procedures such as catheterization and a note was made of the type of hand hygiene product used. Both discrete care activities on individual patients and sequential activities with either one patient or several patients were observed. Patients' informed oral consent was obtained before observations were made.

Each health care professional completed a questionnaire, based on the Theory of Planned Behaviour (TPB) to explore hand hygiene practice[4]. This measured individuals' attitudes, subjective norms, perceived behavioural control, intention and self-report behaviour. The study received ethical approval from the University of Hertfordshire and the relevant NHS Trust. All participants gave written consent prior to participating.

Results

The percentage of opportunities when hands were washed both before *and* after contact with the patient, washing only before, or only after contact for different categories of risk are shown in Table I. Risk assessment[5] calculated cross-infection risk in terms of *degree* (low [e.g. touching the patient], medium [e.g. administration of medicine via percutaneous endogastomy tube], and high [e.g. examining a wound]), and *person* (risk to self, to index patient and to another patient). There were no differences between the medical and surgical wards (ANOVA, $F = 0.068$, $P = 0.801$).

(Table I about here)

The results confirmed relationships between the TPB variables in line with previous research[4]. Of importance here, the self-reported behaviour correlated highly with intention ($r = 0.64$, $p < 0.000$). If these results were considered in isolation, improving attitudes and intentions might be regarded as a useful way of changing hygiene practice. However, self-reported hand hygiene behaviour was not related to actual observations at all as shown in Table II, nor did any of the measures of observed adherence correlate with the intention ratings at all. The results for the subset of 51 were almost identical.

(Table II about here)

Observed practice was not rational. For example, hands were cleaned on only 14% of occasions before (when the aim is to prevent the index patient from developing an infection) but on 86% of occasions after wound care (when the aim is to prevent cross-infection to other patients). 'Contact with urine' results were further analysed – emptying a urine bottle or bedpan contains no risk for the index patient, whereas emptying a urine drainage bag presents risk to the index patient and risk of cross-infection to others. However, results for hand hygiene before were very similar (72% vs. 83%) suggesting staff do not discriminate and fail to assess risks.

The low rate of hand hygiene with MRSA patients/equipment is of concern – although 78% did wash hands after contact (slightly more than the average overall of 61%), only 16% washed their hands both before and after contact (average overall = 12%).

The appropriateness of choice of hand hygiene product in relation to care activity was also analysed. Chlorhexidine gluconate was the most frequently used product both before and after contact, even for low risk activities such as taking observations. After contact with

urine, chlorhexidine gluconate was used on 79% of occasions when liquid soap would have been sufficient. Similarly, of the 24 participants who were observed emptying a urine bottle or bedpan, 5 did not wash their hands afterwards, one person used alcohol gel which would have been inactivated by organic matter, one person correctly used liquid soap and water and the remaining two thirds (16/24) used an antiseptic unnecessarily.

Discussion

Healthcare professionals' hand hygiene was poor despite knowing they were being observed. The practices observed suggest that carers think it more important to prevent cross-infection from one patient to another rather than *preventing* infection of the initial patient. This may arise from an emphasis on *control* rather than *prevention*. However, it is clear that hand hygiene was often not performed even when the care activity posed a high risk of cross-infection both to other patients and self. With the additional risks posed by caring for MRSA patients it was both surprising and a matter for concern that full compliance with hand hygiene regulations was still not found when health professionals were observed performing care activities on these patients.

In addition to the poor hand hygiene observed, another cause for concern is that actual practice was not predicted by self-report measures of practice. If people believe their hand hygiene is much better than it is, they are likely to be oblivious to current campaigns to increase hand hygiene behaviour by changing their attitudes. This raises two points. Firstly, self-reports of hand hygiene practices should be viewed with extreme caution as they are unlikely to reflect practice. A possible explanation for this mismatch may be related to the

circumstances at the time of completing the questionnaire and of being observed. For example, when completing the questionnaire care staff were often off duty or on a work break, i.e. they were relaxed and could deliberate on their responses. In contrast, when they were being observed they were often busy and working on "automatic pilot". The second, and perhaps more important, point is that the only way to assess whether habits have changed is through observation. Thus, the outcome of any training that takes place and measures that are implemented should be assessed by observation, not by self-report.

With regard to the appropriate choice of hand hygiene product in relation to the care activity, it was clear that there was some confusion amongst the health care professionals and that their choices were not based on informed decision making. This may be symptomatic of a general lack of understanding of the hand hygiene procedures, or it may reflect the need for a quick automatic response in a busy ward. Clear, uncomplicated, notices indicating the appropriate type of hand hygiene product by activity may be a way of improving choices.

In view of the findings in this study, changing habits to good practice should be seen as a priority and attention must be given to establishing the most effective way of doing this. Practical training is clearly required in order to change habits and institute attitude changes which are reflected in good hand hygiene practice. At the same time, consideration could also be given to improving health carers' own assessment of risk. For example, we have developed a Dynamic Assessment Strategy for Hand Hygiene (DASHH) which offers one way of changing poor practice. It does this by teaching carers to consider hand hygiene before and after care as separate activities requiring separate risk assessments. Thus, *before* patient contact the carer determines the type of hand hygiene required in relation to the risk to

the patient, the susceptibility of the site to infection and the nature of the activity. *After* patient contact, the carer determines the hand hygiene procedure in relation to the risk to self, risk to other patients and the extent and type of contamination resulting from the activity. Such a strategy provides health care professionals with a simple mental map to make the quick informed decisions that are required when busy on a ward.

Clearly any training, whether using DASHH or an alternative, requires evaluation of its effectiveness. Whatever method or means of improving hand hygiene are used, this study demonstrates that observational assessment should form part of the programme to ensure that there is a beneficial outcome and that good practice is becoming a habit. (1733 words)

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Author contributions:

The authors are most grateful to the participants in this study.

All authors have assisted in the production of the paper. In addition,

Elizabeth A. Jenner is the principal instigator and researcher and one of the infection control experts who made the observations.

Professor Ben (C) Fletcher is the corresponding author and principal supervisor of the research programme.

Philip Watson helped with the administration of the questionnaires and the collection of the observational data.

Dr. Fiona Jones helped to guide the study in all aspects.

Dr. Linda Miller assisted particularly in the design of the observation schedule and also guided the study generally.

Dr. Geoffrey M. Scott helped in study design and facilitated access to the participants and patients.

Conflicts of interest: NIL

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Table I: Percentage of occasions when hand hygiene (HH) behaviour was observed in relation to a range of nursing procedures and risks

	Opportunities N = 642	HH Before AND After	HH Before, but NOT After	HH After, but NOT Before	HH Neither Before NOR After
ALL CONTACT	**642**	**12**	**20**	**61**	**7**
Contact with urine	30	20	7	63	10
Contact with faeces	8	0	0	75	25
Contact with blood	8	25	0	62	13
Taking observations/touching patient	131	14	8	50	28
Handling/moving/examining patient	136	11	4	58	27
Feeding patient/serving food	61	11	18	33	38
Administration of medication by:					
Mouth	53	4	8	25	64
Naso-gastric tube	9	0	0	67	33
Percuataneous- endo- gastrostomy tube	4	0	25	25	50
Nebuliser	1	0	0	100	0
Intravenous injection	17	24	12	35	29
Tracheal suction	13	23	0	69	8
Bladder catheterisation	2	0	50	50	0
Wound management	7	14	0	72	14
Handling/cleaning equipment	90	10	5	53	32
Contact with MRSA patient/equipment	50	16	6	62	16
Taking a meal break	22	4	27	14	55
Risk of infection to patient:					
Low	502	12	18	-	-
Medium	96	8	27	-	-
High	47	19	26	-	-
Risk of infection to another patient:					
Low	412	10	-	56	-
Medium	138	13	-	65	-
High	94	16	-	83	-
Risk of infection to self:					
Low	541	11	-	60	-
Medium	87	14	-	66	-
High	16	13	-	81	-

Table II. Pearson's product-moment correlation co-efficients between self-report hand washing behaviour (1-7 scale) and observed hand washing (mean % of occasions)

	Self-Report Behaviour (n = 71)
Observed adherence: those who washed their hands BEFORE the care activity	-.040, *P* = .742
Observed adherence: those who washed their hands AFTER the care activity	.047, *P* = .698
Observed adherence: those who washed their hands both BEFORE AND AFTER the care activity	.028, *P* = .814