

# Hand hygiene practices amongst patients

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## Abstract

Hand hygiene is seen as one of the principal means of preventing hospital acquired infections for both staff and patients. While there are many guidelines for hand hygiene practices for health professionals, there is a scarcity of research studies about the attitudes and hand hygiene practices among patients. The aim of this study is to explore nurses' and patients' attitudes and behaviours towards patient hand hygiene at a tertiary teaching hospital in Western Sydney. This descriptive study used patient observations of hand hygiene practices using a validated observation tool, face-to-face interviews with patients, and a survey of nurses. Interviews and surveys were textually and quantitatively analysed. A total of 105 patient observations, 50 patient interviews and 51 nurse surveys were collected. The majority of patients and nurses reported hand hygiene as an important aspect of everyday life in preventing infection in the hospital setting. However, this contrasts with the poor patient hand hygiene compliance identified using the patient observation tool. Patient interviews found that more encouragement and education by staff, increased signage and easily accessible facilities will increase hand hygiene practices. This study highlights the importance of patient input in understanding the entirety of hand hygiene practice from both the nurses and patients point of view. Further training of nursing staff in promoting a hand hygiene friendly environment will have a powerful influence among patients and in delivering patient centred care.

**Keywords:** hand hygiene, patients, attitude, behaviour, nursing staff, teaching hospitals, surveys and questionnaires, observation, cross infection

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## Introduction

Hand hygiene remains one of the most important strategies in preventing infections in healthcare settings and preventing healthcare associated infections that affect hundreds of millions of individuals worldwide each year leading to significant illnesses, disabilities, prolonged hospital stay and added financial burden to patients, families and the healthcare system.<sup>1,2</sup> In efforts to prevent such detrimental outcomes and improve patient safety within the healthcare setting, hand hygiene has become the primary area of focus in a wide range of initiatives such as the Centers for Disease Control and Prevention hand hygiene guidelines, and the World Health Organisation 5 Moments for Hand Hygiene.<sup>1,3</sup>

In Australia, a national approach to hand hygiene known as the National Hand Hygiene Initiative (NHHI) is implemented by Hand Hygiene Australia who have been appointed by The Australian Commission on Quality and Safety in Health Care to work with existing strategies and campaigns to maximise the initiatives success. Some strategies of the NHHI include the provision of resources for healthcare workers such as manuals, fact sheets, auditing tool and education to establish a standardised system of outcome of measures to evaluate the initiatives effectiveness.<sup>4</sup>

Despite the significant body of literature regarding hand hygiene practices and resources available for healthcare workers, the behaviours and attitudes of patients toward hand hygiene however has received limited attention.<sup>5,6</sup>

## Background

The hand hygiene of patients is of concern to healthcare workers in health settings as patient hands are a significant source of microbial contamination and lead to increased infection threats to hospital patients.<sup>2,7</sup> The need for patient hand hygiene practices has been cited in the literature as an important part of minimising transmission and rates of infections.<sup>1,6,8,9</sup>

In a study conducted by Larson *et al.*,<sup>10</sup> microbial flora on the hands of the general population differed from healthcare professionals with higher prevalence of colonised gram-negative bacteria and increased resistance to several antibiotics, particularly with

community isolates of *Pseudomonas aeruginosa*. As Landers *et al.*<sup>11</sup> highlighted, most infections within the healthcare setting occurs as a result of the patient's own bacteria and suggests that patients may be seen as unidentified reservoirs of pathogens.

In a literature review by Banfield and Kerr,<sup>8</sup> the authors discussed patient hand hygiene as a significant 'missing link' in prevention and transmission of healthcare associated infections. Their findings suggest that a number of factors contributing to patient hand hygiene compliance were influenced by knowledge, attitudes and accessibility of facilities. Similarly, Ward<sup>6</sup> highlighted the lack of knowledge and awareness amongst patients regarding their own contribution to hand hygiene practices in preventing infections with other factors including not routinely washing hands at home and inability to access or use facilities as a consequence of being immobile.

Another study investigating hand hygiene motivation and practice within the home was conducted by Curtis *et al.*,<sup>12</sup> who reported changing nappies, using the toilet, preparing meals, feeding a baby, handling raw meat, smoking, gardening and domestic cleaning were considered important occasions to wash hands. While participants self-reported frequently washing hands for particular occasions, they were observed to have missed opportunities to perform hand hygiene. In a UK study by Burnett *et al.*,<sup>9</sup> out of the 75 patient hand hygiene opportunities identified, facilities were only offered on one occasion despite 100% (n=33) of nurses and 95% (n=22) of patients believing hand hygiene to be an important part of controlling and preventing infections. Burnett<sup>2</sup> conducted a study to explore more extensively the perceptions, attitudes and self-reported behaviours of clinical ward nurses to patient hand hygiene. She interviewed 443 nurses at varying levels of expertise in a large acute teaching hospital in the UK and found that the nurses perceived the importance of patient hand hygiene and its role in preventing infection but there was only a weak correlation in the self-reported behaviours of assisting patient hand hygiene.

In a study in the US, Ardizzone *et al.*,<sup>13</sup> conducted a pre and post-test research in three surgical wards where patients (n=72) and nurses (n=42) were interviewed to

examine knowledge and perceptions of patient hand hygiene, including observations to determine whether nurses offered assistance with hand hygiene. Both groups received an educational session and the results indicated nursing staff assisting patients increased from 17.3% (n=14) to 44.6% (n=37).

### **Aim**

This study was adapted from the Burnett<sup>2</sup> and Ardizzone *et al.*<sup>13</sup> study and is conducted to explore the attitudes and behaviours of patient hand hygiene and the perceived practice of nurses at various levels from a tertiary teaching hospital in Western Sydney.

### **Methods**

#### **Design**

An explorative descriptive study using patient observations and face-to-face patient interviews conducted across three wards: mixed aged care, neurosurgical and orthopaedics. Nurses from five wards - mixed aged care, neurosurgical and orthopaedics wards, ambulatory procedural care and a general surgical ward at a tertiary teaching hospital in Western Sydney, Australia - completed a survey. The wards were selected based on the expert opinion of the infection control officer and the research team.

#### **Sample**

Patients across the three wards were included in the study based on the following inclusion criteria: required assistance with transferring; patient had blurred vision; patient had glaucoma, cataracts or macular degeneration; incontinent of faeces or urine; needed assistance with mobility; needed assistance with feeding; needed assistance with hygiene and needed assistance with toileting.

### **Data collection**

#### **Observations**

A validated observation tool adapted by Burnett *et al.*,<sup>9</sup> initially developed by Bromley Hospitals NHS, was used to measure hand hygiene compliance. The observations of patients who met the inclusion criteria were conducted by two researchers between peak activity hours of clinical handover, meal times and visitations (07:30-11:30am and 3:30-5:30pm). The observation tool tallied hand hygiene opportunities and whether they were acted upon, missed or offered

by a nurse. The tool consisted of a checklist of eight items (Table I) where researchers marked for a hand hygiene opportunity and for an observation of hand hygiene taking place or not.

#### **Patient Interviews**

Patients who met the inclusion criteria were invited by the researchers to take part in a 5-10 minute semi-structured interview at their bedside. The patients were asked to describe their experiences and attitudes towards hand hygiene and provide recommendations on improving hand hygiene practice. Basic demographic data were also collected. Patients who agreed to participate were given an information sheet and required to sign a consent form detailing the purposes of the research project. The interview schedule consisted of seven closed-ended items and three open responses.

#### **Nurse survey**

A total of 210 hard copy surveys were handed out by five Nurse Unit Managers of hospital wards to the ward nurses to be completed. Nurses who wanted to participate were asked to complete the survey and this constituted voluntary implied consent. The survey consisted of a predominantly quantitative component of items which included demographics, followed by items that mirrored interview questions asked to the patients in this study.

#### **Data analysis**

Quantitative data from the patient interviews and nurse surveys were entered into the Statistical Package for the Social Sciences (SPSS Version 22.0) (IBM, Armonk, NY,) for data analysis. The patient interview and nurse survey data were entered into SPSS and descriptive statistics were calculated. Qualitative data from the patient and nurse surveys were read by two researchers of the research team to identify themes.<sup>14</sup>

Data from the patient observations were tallied as opportunities for hand hygiene and the observed hand hygiene actions which were recorded by researchers. From this the hand hygiene compliance score was calculated as a percentage (Burnett *et al.*<sup>9</sup>).

#### **Ethical approval**

Prior to conducting patient observations and interviews,

**Table I. Patient Observation tool- Opportunities, observations and compliance**

Event	Opportunities	Observed Hand Hygiene Action	Compliance (%) (Observed hand hygiene / hand hygiene opportunities) x 100 = compliance
After using the toilet, commode or urinal	16	10	62.5
Prior to eating	18	5	27.8
After contact with own bodily fluids	5	1	20
After contact with visitors	25	3	12
After contact with nursing staff	21	2	9.5
After touching contaminated objects	22	1	4.5
Prior to contact with visitors	27	0	0
Prior to contact with nursing staff	33	0	0

Nurse Unit Managers of the wards were notified. Data obtained were non-identifiable and all attempts were made to keep anonymity of the patients. No voluntary informed consent was sought from the patients for hand hygiene observations as they were conducted in public clinical areas of the hospital wards and waiting rooms. Approval for the study was given by the Hospital's Human Research Ethics Committee.

## Results

### **Patient Observation Data**

Across three wards, a total of 105 opportunities were identified for hand hygiene events (Table I).

Out of the 16 opportunities identified by the researchers for patients to perform hand hygiene after using the toilet, commode or urinal, ten hand hygiene actions were observed. Eighteen opportunities were identified prior to eating resulted in only five hand hygiene action being performed whereas five opportunities for hand hygiene action following contact with own bodily fluids identified only one hand hygiene action being observed.

After contact with visitors the researchers identified 25 opportunities, resulting in only three observed hand hygiene action. After contact with nursing staff, 21 opportunities were identified and a total of one hand hygiene action was observed. After touching contaminated objects, a total of 22 opportunities were identified and only one hand hygiene action was observed.

Prior to contact with visitors and nursing staff, we identified 27 and 33 opportunities respectively, however, both events resulted in zero hand hygiene actions being observed.

### **Patient Interview Data**

A total of 50 patients gave consent to be interviewed. Gender distribution consists of 58% females (n=29) and 42% males (n=21). Fifty percent of the patients were over 60 years of age (Table II).

In the interview, 50% of patients answered yes when asked if they were offered a chance to wash or clean their hands in the morning. A total of 84% of patients

**Table II. Patient interview questions (n=50) and Nurse survey questions (n=52)**

Patient Interview Questions	Patient Responses	Nurse Survey Questions	Nurse Responses
1 Were you offered the chance to wash/clean your hands this morning?	Yes = 25 (50%) No = 25 (50%)	1 Did you offer facilities to your patients today to enable them to wash/clean their hands this morning?	Yes = 41 (82%) No = 9 (18%)
2 If yes, when was it offered?	Open response	2 If yes, when was it offered?	Open response
3 If yes, what was offered?	Open response	3 If yes, what was offered?	Open response
4 Are you encouraged to wash/clean your hands by staff at specific times i.e. after using the toilet, before meals or when they become dirty?	Always = 13 (26%) Often = 12 (24%) Sometimes = 7 (14%) Rarely = 4 (8%) Never = 14 (28%)	4 Patients are encouraged to carry out hand hygiene at specific times in this unit, such as after going to the toilet and before meals.	Always = 23 (45%) Often = 19 (37%) Sometimes = 9 (18%)
5 Are you happy with the facilities you are offered (if applicable)?	Yes = 42 (84%) No = 8 (16%)	5	
6 I think hand hygiene is an important aspect of everyday life.	Strongly agree = 43 (86%) Agree = 6 (12%) Unsure = 1 (2%)	6 I think hand hygiene is an important aspect of preventing infection in the hospital.	Strongly agree = 48 (92%) Agree = 4 (8%)
7 From my experience in hospital, I think staff feels their own hand hygiene is an important part of preventing infection in hospital.	Strongly agree = 31 (62%) Agree = 17 (34%) Disagree = 1 (2%) Strongly disagree = 1 (2%)	7 From my experience in hospital, I think staff feel their own hand hygiene is an important part of preventing infection in hospital.	Strongly agree = 38 (73%) Agree = 13 (25%) Disagree = 1 (2%)
8 From my experience in hospital, I think staff views patient hand hygiene as an important part of preventing infection in hospital.	Strongly agree = 22 (44%) Agree = 22 (44%) Disagree = 1 (2%) Strongly disagree = 1 (2%) Unsure = 4 (8%)	8 From my experience in hospital, I think staff feel patient hand hygiene is an important part of preventing infection in hospital.	Strongly agree = 26 (51%) Agree = 19 (37%) Disagree = 4 (8%) Strongly Disagree = 2 (4%)
9 If you are unable to get to the sink, which of the following would be preferable for cleaning their hands in hospital? (More than ONE response allowed)	Water and soap = 16 (31%) Hand wipes = 12 (23%) Hand sanitizer = 23 (44%) Other = 1 (2%)	9 If patients are unable to get to the sink, which of the following would be preferable for cleaning their hands in hospital?	Water and soap = 6 (14%) Hand wipes = 5 (12%) Hand sanitizer = 31 (72%) Other = 1 (2%)
10 In your opinion, what more could be done in order for patients to clean their hands in hospital?	Open response	10 In your opinion, what more could be done in order for patients to clean their hands in hospital?	Open response



were happy with the facilities offered for hand hygiene. When patients were asked if they were encouraged to wash or clean their hands by staff at specific times such as after using the toilet, before meals or when dirty, 26% answered always, 24% answered often and 14% answered sometimes and remaining 36% of patients answered rarely or never.

In the interview, a majority of the patients (86%) viewed hand hygiene as an important aspect of everyday life and an important part of preventing infection in hospital (96%). From the patients' experience in hospital, they were asked if they felt that the staff viewed their own hand hygiene as an important part of preventing infection in hospital and 96% agreed or strongly agreed. When asked if they also thought the staff viewed patient hand hygiene also as an important way of preventing infection in hospital, 88% agreed or strongly agreed. Patients were also asked if they were unable to get to the sink what they preferred for cleaning their hands in hospital and 32% reported water and soap, 23% preferred hand wipes and 44% preferred hand sanitizer.

Questions 2 and 10 were open-ended (Table II). Question 2 followed on from question 1, if patients answered yes to being offered a chance to wash hands. The most common responses to when it was offered were "morning" (n=8), "after using toilet" (n=4) and "in shower" (n=4). The most common responses to what was offered were "water and soap" (n=8), "shower" (n=4) and "sanitizer" (n=6).

Question 10 asked what more could be done in order for patients to clean their hands in hospital and most common responses were "more visible signs" (n=9), "more awareness and encouragement" (n=6) and "education" (n=2).

### **Nurse Survey Data**

A total of 52 nurses completed the surveys. The majority of the nurses were females (84%, n=43) and aged under 50 years (80%, n=42).

In the nurse surveys, 82% of nurses answered yes when asked if they offered a chance to wash or clean patients' hands in the morning and other 18% answered not offering facilities to patients.

When nurses were asked if they encouraged patients to carry out hand hygiene at specific times in their ward, such as after using the toilet, before meals or when dirty, 45% answered always, 37% answered often and 18% answered sometimes.

The majority of nurses responded positively to the question on whether some of their patients required assistance with appropriate personal hand hygiene.

All of the nurses viewed hand hygiene as an important aspect of everyday life and viewed hand hygiene as an important part of preventing infection in hospital.

They were asked if they felt, from their own experience in hospital, if the staff viewed their own hand hygiene as an important part of preventing infection in hospital. Nearly all (n=51, 98%) agreed with the statement. Nurses were asked if they also thought the staff viewed patient hand hygiene as important to preventing infection in hospital, the majority agreed (88%) while six nurses (10%) disagreed. When the nurses were asked if patients were unable to get to the sink, which of the following would be preferable for cleaning their hands in hospital, the nurses stated hand sanitizer as the most used out of the hand hygiene facilities (72%), followed by water and soap (14%) and hand wipes (12%).

### **Discussion**

The findings from this study extend the work reported by Ardizzone *et al.*<sup>13</sup> and Burnett *et al.*<sup>9</sup> in that patients and nurses understand the importance of hand hygiene practices for the prevention and spread of hospital associated infections. However, similar to the studies by Kundrapu *et al.*,<sup>15</sup> Burnett *et al.*,<sup>9</sup> and by Pittet *et al.*<sup>16</sup> there is incongruence between the patient opportunities available for hand hygiene and the frequency with which nurses offer assistance to patients to perform the task.

The patient observational work by Pittet *et al.*<sup>16</sup> and Burnett *et al.*<sup>9</sup> on patient hand hygiene practices was conducted with a smaller sample size and number of wards. The findings from this study is similar to these previous studies and that of Ardizzone's *et al.*<sup>13</sup> study, even though their study was conducted predominantly in surgical wards while this study was conducted primarily in medical wards.

Burnett<sup>2</sup> in her study reported that hand hygiene behaviours of patients rely heavily on the encouragement and support of healthcare workers. This ultimately determines the frequency of opportunities available and that adequate engagement occurs for hand hygiene. This was evident in the findings of our study as some patients outlined in their interviews that they preferred nurses to encourage and remind them of hand hygiene alongside increasing education and increasing hand hygiene signage.

Some forms of physical contact, including shaking hands or touching objects in a patient's room, is a common and inevitable social interaction between patients and nursing staff. Some forms of contact, unless visibly gritty or soiled, may not inherently warrant the patient to clean their hands even though the risk of cross-contamination remains high.<sup>6</sup> It is in this uncertainty and differences in hand hygiene practice and perceptions that preventable infections can be modified.

A recent systematic review conducted by Srigley *et al.*<sup>17</sup> reported successful hand hygiene interventions in patients and health care workers. Their findings emphasise a lack of rigor in the study design of the 10 studies that were included in their review. Of these, four studies reported hand hygiene compliance among patients. Similar to the review findings, our study found that accessible hand sanitizers are a preferable means to clean hands, since they are more convenient and effective especially for those patients that are less mobile or bed ridden. Our study found this preference over the conventional water and soap for the nursing staff.

A recommendation by Srigley *et al.*,<sup>17</sup> based on most of the patient interventions studies included in their review (n=7), was that ongoing education and training about the importance and compliance to hand hygiene practices and recognising the five moments for both patients and the nursing staff is necessary for creating lasting change that will curb the increase in hospital related infections.

### Limitations

This study was conducted primarily by two of the three researchers (authors). Attempts were made to increase

the interrater-reliability of the study with ongoing discussion between the researchers prior to and after the interviews and observations. However, because the study design for observations was developed to capture peak activity between patients and nursing staff, it is understood by the researchers that the dynamic ward environment may have biased the opportunities and the observed hand hygiene events.

Hand hygiene audits occurred a few months prior to this study and during observations there was a prominent Hawthorne effect that was noticeable from the nursing staff in the wards, which was not the aim of the study but an issue that was recognised by the researchers because nurses were seen to constantly wash their hands in front of the researchers. Another issue that was found was that self-reporting may lead to an overestimation of real behaviour, which has been reported in Srigley *et al.*<sup>17</sup>

There were difficulties in the recruitment of nurses to complete surveys as is the common issue among researchers conducting research with nurses.<sup>18</sup> Given the small sample size, a follow up attempt was not fruitful so the researchers decided to distribute the surveys through the wards Nurse Unit Managers and getting the Nurse Unit Managers to request their nursing staff to complete the surveys.

### Conclusion

In conclusion, hand hygiene among patients is a key issue within a healthcare setting. This study emphasises that there is a persisting different attitudinal perception among patients and nursing staff. Based on the findings of Srigley *et al.*'s systematic review,<sup>17</sup> there is a need for study designs that are more rigorous. This study, while only a descriptive study, builds on this body of work as there is a scarcity of literature on hand hygiene studies with patients at the core. It is continually reported in a number of studies that patient hand hygiene is the 'missing link' in improving compliance and minimising the rates of hospital related infections. Further research in this area regarding nurse and patient education and training needs to be done with more patient cohorts in a wider healthcare setting.

That hand hygiene prevents transmission of infections within a healthcare setting is a widely known

concept, that requires further increased compliance and understanding within patient cohorts. Nurses encouraging and prompting patient hand hygiene, alongside their own, may lead to overall reduced rates and transmissions of infections. This should be accompanied by increased hand hygiene education directed towards patients. Increasing visual signs and easily accessible hand hygiene facilities may also initiate better compliance and empower patients to actively participate in delivery of their own health care. Patients could be the missing link in the prevention and transmission of infections within the healthcare system.

Our study indicated that both patient and nurses consider hand hygiene as important despite an incongruence existing between offering of hand hygiene to patients and the opportunity to exercise it. Hand sanitizer and water and soap were preferred choices of nurses and patients in performing hand hygiene. From observations, there was poorer compliance to hand hygiene than was suggested in the nurse surveys, and mismatch between patients and nurses regarding when hand hygiene should be offered and when it is done.

What we were able to uncover as a result was the lack of attention and focus placed on patient hand hygiene, a better understanding as to why healthcare associated infections remain a key issue in almost every healthcare facility, and that patients may be that crucial 'missing link' in minimising rates of infections.

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