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Patients' capability, opportunity, motivation, and perception of inpatient hand hygiene

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Abstract

Background: Studies that examine the perceptions and behaviors of patients regarding patient hand hygiene rarely examine the viewpoint of patients about their hand hygiene behavior relative to current resources provided in the hospital.

Methods: Voluntary interviews that employed a 16-item survey tool were used among patients (N = 107) in outpatient clinics at post-admission visits. The survey was created using the Behavior Change Wheel, Capability, Opportunity, Motivation Behavior model. Patients were asked whether they brought hand sanitizer to the hospital, used hospital resources to clean their hands, and their perspective on patient hand hygiene importance compared with hospital staff, as well as their satisfaction or lack of satisfaction with hand hygiene independence.

Results: Most of the participants (65, 60.7%) reported that prior to being admitted to the hospital, they were able to maintain cleaning their hands with little or no difficulty. During their admission, only 21 (19.6%) of the participants reported needing little or no assistance. More than one-half of the participants, 34 (31.8%) and 23 (21.5%), respectively, reported, mostly or completely agreeing that the hand hygiene of the health care staff was more important than their own. Close to one-half of the participants (50, 46.7%) reported not being satisfied at all with their ability to maintain their hand hygiene in the hospital, whereas only 10 (9.3%) were very satisfied with their ability to maintain hand hygiene.

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Conclusions: Findings from this study will enhance our understanding of how to incorporate inpatient hand hygiene into existing infection control programs in inpatient settings.

Keywords

Patient hand; Inpatient hygiene; Patient behavior; Patient practice; Patient perceptions; Patient capability

The hands of patients in hospitals and in long-term care facilities are often contaminated with health care–associated pathogens.^{1,2} Health care staff and patients acknowledge the importance of patient hand hygiene,³ but observational studies suggest that patients perform hand hygiene more than 40% of the time when it is indicated.^{1,4–6} In surveys, patients often attribute their poor hand hygiene practices primarily to staff being too busy to provide assistance and lack of access to hand hygiene products.^{7–10} Patient hand hygiene will improve if it is facilitated by health care staff who provide patients with education and products;⁵ however, this requires much effort and, therefore, it is difficult to maintain.^{1,4,7,10} A recent study has shown that patient hand hygiene at home predicts their hand hygiene practices in the hospital.¹¹ Therefore, patients who infrequently practice hand cleaning at home may require education on the importance of hand hygiene in hospitals, whereas those who regularly perform hand hygiene at home may benefit more from efforts to make hand hygiene products readily available.

To develop new approaches to improve patient hand hygiene, it is important to understand the perceptions of the patient's experiences related to hand hygiene in inpatient settings. Data about patient hand hygiene are retrieved from inpatients via hand cultures,¹² surveys,¹³ observations,⁴ real-time ultrasound tracking,⁶ and self-report³ about hand hygiene practices. During inpatient stays, many patients may be overwhelmed with their medical condition and care, or are simply too ill to provide responses to surveys. Thus, we surveyed patients with recent hospital stays during outpatient clinic visits to obtain information on their perceptions of barriers to and facilitators of patient hand hygiene, and their satisfaction or lack of satisfaction with their ability to maintain hand hygiene practice during their recent past hospitalization.

METHODS

Setting

Between January 2018 and April 2018, we administered a questionnaire to a cross-section of patients during a post-hospital clinic visit at the Louis Stokes Cleveland Veterans Affairs Medical Center (Cleveland VA Medical Center). Patients at the time of their admission to an inpatient medical-surgical unit (210 beds) at the Cleveland VA Medical Center are provided with a hygiene kit that contains a 4-ounce bottle of hand sanitizer for their use. Health care staff are encouraged to remind patients that they have hand sanitizer in their admission kits. All patient rooms and bathrooms on the unit contain a sink, and hand sanitizer dispensers are located on the walls outside and inside of patient rooms. Patients receive a small, prepackaged lemon-scented towelette with every meal. There are signs outside of each room that remind health care staff, visitors, and patients to please clean their hands. Health care

staff are asked to complete a documentation note under activities of daily living that addresses hand hygiene education. The study protocol received ethical approval, and verbal consent was obtained from each participant.

Sample

A convenience sample of participants was recruited at the Cleveland VA Medical Center. Inclusion criteria for participants included (1) that it be their first follow-up appointment after discharge from the acute care medical-surgical unit or surgical care unit at the Cleveland VA Medical Center, (2) they be English speaking, and (3) they be cognitively intact. Screening criteria included asking the potential study participants whether they knew the current date, time, and location. They were also asked if they were being seen by a doctor following a hospitalization within the past 30 days. Participants hospitalized more than once within 30 days were excluded from the study.

Participant characteristics

Participants were asked their age (years), sex (man, woman, or transgender), length of stay in the hospital (days), and their first and last initials only.

Survey tool

The 16-item survey tool was modified from a published survey (Sunkesula et al.) influenced and guided by the World Health Organization (WHO). The WHO's Multimodal Hand Hygiene Improvement Strategy¹⁴ key components, including a baseline assessment for system change and perceptions of hand hygiene for health care staff, were adapted and incorporated into the overall Behavior Change Wheel (BCW) framework, which incorporates the Capability, Opportunity, Motivation, and Behavior (COM-B) model.¹⁵ The BCW is an amalgamation of 19 behavior change frameworks that have been used among a wide range of disciplines and approaches. Michie et al proposed that systemically at the core of the BCW are the COM-B constructs (capability, opportunity, and motivation), which are components of an interacting system that influence each other, thus leading to sustainable behavior change¹⁵. Michie et al proposed that people must have the capability, opportunity, and motivation to be actionable in behavior change, and that understanding these components can be essential in developing sustainable interventions. Using the COM-B model, the 16-item questionnaire was created to explore the capabilities, opportunities, and motivation for patient hand hygiene. A content validity index for clarity and relevance for each item¹⁶ was established for each domain and was rated by 2 health care experts and 2 patients who could have been potential participants. The 2 health care experts have experience in infection prevention and research. Expert recommendations were incorporated, thus changing some wording of the items in the survey. The rating score for each item that received a 3 or 4 was individually calculated and divided by the number of experts. Items not 0.80 or greater were removed from the survey. The Cronbach alpha of the questionnaire is 0.848, therefore, signifying good reliability for this 16-item survey.

SURVEY MEASURES

Capability

The COM-B model “capabilities” consisted of 4 survey items. These included asking participants if their past or current work history requires hand hygiene as a part of regular duties (yes, no), their ability to maintain hand hygiene prior to their admission (unable to do, with much difficulty, with some difficulty, with little difficulty, without difficulty), and their ability to walk themselves to the sinks in their room and/or bathrooms to wash their hands (unable to do, with much assistance, with some assistance, with little assistance, without assistance). Last, participants were asked when they felt they needed their hands to be cleaned, how often they asked health care staff to assist them (never, almost never, sometimes, often, very often).

Opportunity

The COM-B model “opportunity domain” consisted of 5 survey items that captured information about hand hygiene products available and participant use. Participants were asked if during their hospital admission they used their personal (not hospital supplied) hand sanitizer (yes, no), if they used the hospital supplied hand sanitizer provided to them in their hygiene kit given to them during admission (yes, no, unable to do, wasn’t aware I had it in my kit), used the hand sanitizer dispensers on the walls inside and/or outside of their rooms (yes, no, unable to do), used the small towelettes on their meal trays (yes, no, unable to do), and whether they used the sinks inside of their rooms and/or bathrooms (yes, no, unable to do).

Motivation

The COM-B model “motivation” domain consisted of 5 survey items. Participants were asked about hand hygiene importance as a patient in the hospital (not important, a little important, somewhat important, important, very important) and if staff hand hygiene is more important than for patients (completely disagree, mostly disagree, neither agree nor disagree, mostly agree, completely agree). Participants were asked if they thought the wall dispensers were meant for health care staff only to clean their hands and not patients (completely disagree, mostly disagree, neither agree nor disagree, mostly agree, completely agree), whether the hands of patients plays an important role in preventing them from getting sicker (not important, a little important, somewhat important, important, and very important). Last, participants were asked how often they were reminded by health care staff to clean their hands (never, almost never, sometimes, often, and very often).

Behavior and satisfaction with maintaining hand hygiene

The COM-B model “behavior” domain was covered by 1 item, which asks the average daily frequency in which they performed hand hygiene as an inpatient in the hospital (0 times per day, 1–2 times per day, 3–5 times per day, more than 5 times per day). Participants were asked about their overall satisfaction with their ability to clean their hands in the hospital in comparison to how well they were able to maintain them at home (very unsatisfied, unsatisfied, neutral, satisfied, very satisfied).

Data collection and analysis

Responses were collected from participants by way of a structured interview. Data was collected in the same order the questions were asked in the survey. Descriptive statistics and univariate analysis were used to summarize the data. A P value of $< .05$ was considered statistically significant. Data analyses were performed using SPSS software version 23 (IBM Corporation, Armonk, NY).

RESULTS

Demographics

During outpatient clinics, 126 patients were approached and 19 were excluded owing to having more than 1 admission within 30 days, leaving a total of 107 participants eligible to complete the survey. Most of the 107 participants were men 103 (96.3%). The average age was approximately 63.5 years ($SD = 14.69$), and the length of stay ranged from 2–13 days, with an average of 6.69 days ($SD = 3.12$).

Capability

Of more than one-half of the participants, 60 (56.1%) reported a previous work history that required them to clean their hands, whereas 47 (43.9%) did not. Most of the participants reported that prior to being admitted to the hospital, they were able to maintain clean hands with no difficulty or little difficulty, 26 (24.3%) and 39 (36.4%), respectively. In contrast, during hospitalization, more than one-half of the participants (56, 52.3%) reported needing much assistance when walking to the sink in the room or to their bathroom when they were admitted (Table 1). Close to one-third of the participants (34, 32%) never asked a health care staff member to assist them with cleaning their hands during their hospital stay.

Opportunity

Most of the participants (83, 77.6%) reported that they did not use their personal (not hospital provided) hand cleaning product during their stay in the hospital (Table 1). When participants were asked about the use of the hospital-supplied hand sanitizer provided to them in their admission kit, 50 (46.7%) reported not using the hand sanitizer and 24 (22.4%) did not know hand sanitizer was provided in their kits. Almost one-half of the participants (49, 45.8%) reported not using the hand sanitizer product located on the walls inside or outside of the room, and 41 (38.3%) reported that they were unable to use the hand sanitizer product on the walls inside or outside of the room (Table 1). Despite hand towelettes being placed on the food trays of patients during meal times, 49 (45.8%) of the participants report not using them, 43 (40.2%) reported they did use them, and 15 (14%) reported they were unable to open the hand towelette package.

Motivation

Approximately 32% ($n = 34$) reported that cleaning their hands as a patient during their last hospital stay as important and 27.1% ($n = 29$) as very important (Table 1). Surprisingly, more than one-half of the participants mostly agreed or completely agreed that health care staff hand hygiene is more important than patient hand hygiene, 34 (31.8%) and 23 (21.5%),

respectively. When participants were asked whether they thought the hand sanitizer dispensers on the wall and in the room were meant for health care workers and not for them, 22 (20.6%) responded that they completely agreed, and 33 (30.8%) mostly agreed (Table 1). When participants were asked if cleaning their hands played an important role in preventing them from getting sicker, approximately 26% (n = 28) report that their hand hygiene did not make a difference. Only 1 (0.9%) participant report being reminded very often to clean hands by health care staff. Table 1 shows that nearly 30% (n = 32) of patients report almost never being reminded to clean their hands.

Behavior and satisfaction with maintaining hand hygiene

Of the 107 participants who were asked about the average frequency per day of their hand hygiene, 32 (29.9%) reported not cleaning their hands at all and 38 (35.5%) report 1–2 times per day as their average for cleaning their hands. Nearly half of the participants (50; 46.7%) report being very unsatisfied with their ability to maintain their hand hygiene compared with how they did when they were at home, whereas only 16 (15%) were very satisfied with their ability to maintain clean hands.

DISCUSSION

Hand hygiene is a societal norm at home at meal times, during bathroom use, and occurs in public settings such as grocery stores before or after handling meat and produce. Depending on the line of work, employees, who can become health care patients, work in various occupations that may require them to abide by hand hygiene standards and guidelines. Children, who are also seen as patients in health care settings, have scheduling that requires them to clean their hands in childcare and school settings.^{17–19} Despite health care settings being one of the most likely places to acquire or transmit pathogens, patients are not included in routine hand hygiene practice. To date, contextual guidelines, standards, and implementation strategies of hand hygiene practice primarily focus on health care staff, and consequentially, hand hygiene is not a deliberate practice for patients. Hand hygiene helps to keep everyone safe from pathogen transmission; therefore, our underlying assumption is that because good hand hygiene universally decreases the spread of infections, no hands should be ignored. Unfortunately, the practice of inpatient hand hygiene in hospitals and other health care settings is an underused preventative strategy against pathogen transmission. More studies and interventions are needed to understand and apply barriers and facilitators for patient hand hygiene, as this research plays an important role in preventing the spread of infection from patient to health care worker, and from patient to patient. Despite recognition that patient hand hygiene practice is important, it is a deficient practice in many health care settings.^{7,20,21} Decreased rates of hand hygiene practice by patients are attributed to barriers such as patients' age, level of care, ambulatory status, and or cognition, all of which may potentially inhibit the ability of the to access hand hygiene products.^{1,22,23} Further, the findings of this study and past studies^{7,8,20} suggest that most patients believe their personal hand hygiene is important, but that capability and feasibility are barriers. For example, one study shows that despite patients being provided with education and hand hygiene resources, self-initiated patient hand hygiene rates were still less than 40%.⁵ Capability is the ability to do something. The assumption has been made that patients can practice hand hygiene in

health care settings. However, because of the resources available for health care staff use, studies show that, although guidelines govern health care staff use of common products such as wall hand sanitizer dispensers, it may have inhibited the comfort levels of patients with independent use of these products. Despite multiple hand hygiene resources, such as wall dispensers, sinks, towelettes, and individual hand sanitizer, for patients, barriers, facilitators, and knowledge for patient use of these resources deserves further exploration. For example, patient-centered education around infection prevention is needed so that patients do not believe that hand hygiene resources around the hospital are only meant for health care staff. Implications from this study will promote direct exploration of determinants that influence the ability of patients to manage their hand hygiene, therefore, making it easier to identify appropriate interventions for hospitalized patients.

Patient hand hygiene is an emerging area of science. Our future studies will seek to understand dissemination and implementation strategies for the promotion, adoption, and integration of patient hand hygiene into a cadre of existing infection control programs. To our knowledge, this is the first study that explores patient perspectives using the COM-B model, in which patients are allowed to reflect on their own personal care experiences post-discharge as it relates to their personal infection prevention efforts. Future studies can use this model as a pre-implementation strategy for sustainable interventions.

Our study has some limitations, including the patients' self-report of their hand hygiene practice. Inpatient participants surveyed post-discharge may not have accurately recalled their hand hygiene practices; however, similar limitations were found regarding patients in inpatient settings faced with health conditions, medications, and circumstances that might have altered their self-reporting. In this study, the products asked about in the survey were selected based on the study sites offerings and peer-reviewed literature. The survey used in this study may not cover the full spectrum of hand hygiene product options available to patients for use. Our findings may not be generalizable to other institutions also because they do not address hospital policies outside of the study site that may promote or inhibit patient use of certain products. Furthermore, our cross-sectional survey was done at a single site via convenience sampling of adult patients, most of whom were men. Last, although patients reported no use of some of the products, physical, mental, religious, and personal values that may influence preferences were not explored. Future studies should include hand cultures, observational practice, and/or measurement of product use to augment patient reports of their hand hygiene practice. Future work in this area will also determine whether the findings in this sample are similar findings among other institutions.

CONCLUSIONS

This study demonstrates that clean hands are important to patients and that despite the ability of the to manage their hand hygiene, with little or no assistance prior to their admission, less than one-half were able to maintain the same level of independence for cleaning their hands while in the hospital, despite the provision of multiple resources. This study also shows that some patients believe health care staff hand hygiene is more important than their own and that although some of the hand hygiene resources of the hospital are visibly accessible to health care staff and patients, patients perceive these resources to be

solely intended for health care staff, not patients. To date, there is limited research in the area of inpatient hand hygiene. Therefore, considering the importance of patient engagement in infection prevention, future research, for both cross-sectional and longitudinal studies, is needed to examine patient hand hygiene as a preventative strategy and on its influence for the prevention of health care—associated infections.

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Table 1

	Yes	No	
Does or did any of your jobs require you to clean your hands as a part of your daily responsibilities? n (%)	60 (56.1%)	47 (43.9%)	
Prior to my hospital stay, I was able to maintain my hand hygiene, n (%)	5 (4.7%)	12 (11.2%)	25 (23.4%)
	Unable to Do	With Much Assistance	With Some Assistance
During my hospital stay, I was able to walk myself to the sink in my room and or bathroom. n (%)	16 (15%)	56 (52.3%)	14 (13.1%)
	Never	Almost Never	Sometimes
During my hospital stay, when I felt my hands needed to be clean I asked the healthcare staff to assist me. n (%)	34 (31.8%)	22 (20.6%)	21 (19.6%)
			Often
			Very Often
			7 (6.5%)
			Without Assistance
			15 (14%)
			26 (24.3%)
			Without Assistance
			39 (36.4%)
			With Little Difficulty
			23 (21.5%)
			34 (32%)
			Important
			Very Important
			29 (27.1%)
			Mostly Agree
			23 (21.5%)
			34 (31.8%)
			Mostly Agree
			22 (20.6%)
			33 (30.8%)
			Mostly Agree
			22 (20.6%)
			30 (28%)
			Very Often
			1 (0.9%)
			26 (24.3%)
			Often
			30 (28%)
			Sometimes
			28 (26.2%)
			Does Not Make A Difference
			Mostly Important
			19 (17.8%)
			Mostly Disagree
			26 (24.3%)
			Neither Agree Nor Disagree
			20 (18.1%)
			Somewhat Important
			34 (32%)
			Important
			Very Important
			29 (27.1%)
			Mostly Agree
			23 (21.5%)
			34 (31.8%)
			Mostly Agree
			22 (20.6%)
			33 (30.8%)
			Mostly Agree
			22 (20.6%)
			30 (28%)
			Very Often
			1 (0.9%)
			26 (24.3%)
			Often
			30 (28%)
			Sometimes
			28 (26.2%)
			Does Not Make A Difference
			Mostly Important
			19 (17.8%)
			Mostly Disagree
			26 (24.3%)
			Neither Agree Nor Disagree
			20 (18.1%)
			Somewhat Important
			34 (32%)
			Important
			Very Important
			29 (27.1%)
			Mostly Agree
			23 (21.5%)
			34 (31.8%)
			Mostly Agree
			22 (20.6%)
			33 (30.8%)
			Mostly Agree
			22 (20.6%)
			30 (28%)
			Very Often
			1 (0.9%)
			26 (24.3%)
			Often
			30 (28%)
			Sometimes
			28 (26.2%)
			Does Not Make A Difference
			Mostly Important
			19 (17.8%)
			Mostly Disagree
			26 (24.3%)
			Neither Agree Nor Disagree
			20 (18.1%)
			Somewhat Important
			34 (32%)
			Important
			Very Important
			29 (27.1%)
			Mostly Agree
			23 (21.5%)
			34 (31.8%)
			Mostly Agree
			22 (20.6%)
			33 (30.8%)
			Mostly Agree
			22 (20.6%)
			30 (28%)
			Very Often
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			Often
			30 (28%)
			Sometimes
			28 (26.2%)
			Does Not Make A Difference
			Mostly Important
			19 (17.8%)
			Mostly Disagree
			26 (24.3%)
			Neither Agree Nor Disagree
			20 (18.1%)
			Somewhat Important
			34 (32%)
			Important
			Very Important
			29 (27.1%)
			Mostly Agree
			23 (21.5%)
			34 (31.8%)
			Mostly Agree
			22 (20.6%)
			33

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During my hospital stay, I used the hand sanitizer provided to me in my hospital stays kit to clean my hands. n (%)	14 (13.1%)	50 (46.7%)	19 (17.8%)	24 (22.4%)
	Yes	No	Unable to Do	
During my hospital stay, I used the hand sanitizer dispensers on the wall in the hallway or in my room to clean my hands. n (%)	17 (15.9%)	49 (45.8%)	41 (38.3%)	
	Yes	No	Unable to Do	
During my hospital stay, I used the sinks in either my room or bathroom to clean my hands. n (%)	32 (29.9%)	55 (51.4%)	20 (18.7%)	
	Yes	No	Unable to	
During my hospital stay, I used the small lemon towelette placed on my food trays to clean my hands. n (%)	43 (40.2%)	49 (45.8%)	15 (4%)	

Overall, how satisfied were you with your ability to clean your hands in the hospital in comparison to how well you were able to maintain them at home? n (%)				
Satisfaction	Very Unsatisfied	Unsatisfied	Neutral	Very Satisfied
	50 (46.7%)	21 (19.6%)	10 (19.3%)	10 (9.3%)
On average, how many times per day did you clean your hands while you were in the hospital? n (%)				
	0 times per day	1–2 times per day	3–5 times per day	> 5 times per day
Behavior	32 (29.9%)	38 (35.5%)	23 (21.5%)	14 (13.1%)