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Review

Patient empowerment and hand hygiene, 1997–2012

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SUMMARY

Background: Multi-modal hand hygiene programmes that include patient empowerment are promoted as a necessary component of hand hygiene compliance. However, the question still remains, do we have enough information to determine if, and under what conditions, patients will be able to play an immediate role in healthcare workers' hand hygiene behaviour?

Aim: To review the current literature on patient willingness to be empowered, barriers to empowerment, and hand hygiene programmes that include patient empowerment and hand hygiene improvement.

Methods: A Medline (Ovid) search of all English-language papers for 1997–2007 and 2008–2012 was conducted using the following keywords alone and in various combinations: 'patient participation', 'involvement', 'empowerment', 'education', 'decision-making', 'professional–patient relations', 'behavioural change', 'culture of safety', 'social marketing', 'consumer awareness', 'leadership', 'institutional climate', 'hand hygiene' and 'patient reminders'. The 1997–2007 review was conducted as part of the World Health Organization's Guidelines on Hand Hygiene in Health Care, and updated with the 2008–2012 review.

Findings: Several studies show that, in principle, patients are willing to be empowered. However, there is variation in the actual number of patients that practice empowerment for hand hygiene, ranging from 5% to 80%. The actual performance of patient empowerment can be increased when a patient is given explicit permission by a healthcare worker.

Conclusion: There is ongoing support from patients that they are willing to be empowered. There is a need to develop programmes that empower both healthcare workers and patients so that they become more comfortable in their roles.

Introduction

Healthcare-associated infections (HAIs) remain a major patient safety issue, but the compliance of healthcare workers (HCW) with best hand hygiene practices remains low despite years of education, teaching and research.[1] Many institutions have improved hand hygiene compliance over the past two decades, and more recently there have been successful initiatives as a result of the World Health Organization's (WHO) standardized methodology for multi-modal hand hygiene promotion.[1,2] This methodology is supported by the WHO Guidelines on Hand Hygiene in Health Care (WHO HH Guidelines). The strategy has five steps: (1) system change, including HCW access to alcohol-based hand rub at the point of care, and to soap, clean towels and a safe, continuous supply of water; (2) staff education and training; (3) monitoring and evaluation, including evaluation of HCW knowledge and providing hand hygiene compliance performance feedback; (4) reminders in the workplace; and (5) an institutional safety climate, with active and visible participation from HCWs, managers and, when feasible, patients. The successful findings from this

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strategy can be found in the WHO HH Guidelines.[1,3] The issue that now needs to be addressed is whether there is sufficient evidence to move patient participation from 'feasible' to 'necessary'.

In 2000, Pittet *et al.*[4] reported the first study associating institution-wide hand hygiene promotion and involvement of managers as well as HCWs with a reduction in HAI prevalence over several years. Meanwhile, McGuckin *et al.*[5] reported on the positive impact of the role of the patient in hand hygiene compliance programmes in the USA and the UK; an approach that many believed was not possible at that time.[6]

A decade later, the strategy of a multi-modal programme that includes patient empowerment has been promoted as a necessary component of hand hygiene programmes.[7,8] The US Centers for Disease Control and Prevention encourages patients to speak up through promotional videos giving them the skills and knowledge to be empowered.[9] Patients have been engaged as hand hygiene observers of their HCWs.[10] The WHO HH Guidelines include a step-by-step strategy for involving patients.[1] The question remains, does research support a necessary adoption of patient empowerment in these programmes? This review will attempt to answer this question by considering the evidence for various environmental and interpersonal conditions in which patients will be able to play an immediate role in the hand hygiene behaviour of HCWs. The review is summarized in the following subtopics: (1) the willingness of patients to be empowered; (2) the importance of HCW empowerment; (3) barriers to empowerment; (4) effective models for empowerment; (5) skills/strategies for implementing empowerment programmes; and (6) future direction.

Definition

The term 'empowerment' can have different meanings and interpretations. In health care, it refers to the process that allows an individual or a community to gain the knowledge, skills and attitudes needed to make choices and participate in their care.[11] The WHO HH Guidelines define empowerment as 'a process in which patients understand their opportunity to contribute, and are given the knowledge and skills by their healthcare provider and other educational sources to perform a task in an environment that recognizes community and cultural differences and encourages patient participation'.[1]

In some healthcare settings, other terms used include patient 'involvement', 'participation' and 'engagement'. However, the foundation of these alternative words is really empowerment. One cannot participate, be involved or be engaged without the components of empowerment: knowledge, skills and an accepting environment. The term one chooses to define this process will depend on what is appropriate for the specific culture of a region or community.[12] For the purpose of this review, the word 'empowerment' is used.

Method

This review follows two separate but related works: the WHO HH Guidelines and a companion review, 'Patient Empowerment and Multimodal Hand Hygiene Promotion: a Win—Win Strategy'.[8] Both works review and evaluate research from 1997 to 2008 that applies patient empowerment to hand hygiene.[1]

For the update, a similar methodology was used to that of the 1997—2007 review, and a Medline (Ovid) search of all English-language papers published from 2008 to 2012 was conducted. The following keywords were used alone and in various combinations: 'patient participation', 'involvement', 'empowerment', 'education', 'decision-making', 'professional—patient relations', 'behavioural change', 'culture of safety', 'social marketing', ' consumer awareness', 'leadership', 'institutional climate', 'hand hygiene' and 'patient reminders'. Thirty-three publications were retrieved and reviewed, yielding 22 full papers on patient empowerment and hand hygiene.

Results and discussion

The results can be categorized into two groups: (1) the willingness of patients to be empowered, and (2) barriers to empowerment; and presented in two timeframes corresponding to the two review periods. These results are followed with a summary of programmes on patient empowerment and improvement of hand hygiene compliance.

Willingness to be empowered

1997—2007

A patient's willingness to be empowered has been influenced significantly by the revolutionary USA Institute of Medicine reports on health quality and safety.[13,14] Of particular interest is their novel focus on increasing public awareness of medical errors and national efforts to actively engage patients in their own care. The extent to which patients wish to be empowered was debated as early as 1989. One of the first studies looking at the willingness of patients to be empowered was published by Miller and Farr.[15] They assessed patient knowledge of HAIs in the USA by asking if they were satisfied with the information they received about HAIs, and if they were willing to pay for increased investment in infection control programmes within their hospital. Seventy percent of patients were concerned about the risk of HAIs, 69% reported that the risk was never explained, and 57% stated that they would be willing to pay for improved infection control programmes and information on HAIs.

Nearly 20 years later, the National Patient Safety Agency for England and Wales assessed patient views on involvement as part of their 'cleanyourhands' campaign, and reported that 71% of respondents wanted to be involved in improving hand hygiene practices.[16] Similar results were reported by an acute care trust,[17] where 79% of patients thought that they should be involved in hand hygiene improvement.

In studies conducted in the USA and the UK, McGuckin *et al.*[6,18] reported on patient willingness to be empowered and involved in hand hygiene by asking their HCWs to clean their hands. An important part of their research design was giving patients knowledge and explicit permission. They reported that although 80—90% of patients agreed to ask their HCWs in principle, the percentage of those who actually asked their HCWs was slightly lower at 60—70%. A survey of consumers on their attitudes about hand hygiene found that four out of five consumers said that they would ask their HCWs, 'Did you wash/sanitize your hands?' if their HCWs educated them on the importance of hand hygiene and gave them permission to ask.[19] In a telephone survey of US patients from 11 hospitals, only 45%

said that they would be comfortable asking their HCWs about hand washing, and at follow-up interview, only 5% said that they had actually asked. No formal patient error prevention educational programmes or information were given to the patients about their role before the survey.[20] Another survey of 80 patients in a surgical department in the UK reported that the population given specific instruction by their doctor to ask about hand hygiene were significantly more willing to do so.[21]

In 2007, WHO conducted a two-part survey on patient empowerment to gain further knowledge and to incorporate geographically and culturally diverse perspectives related to empowerment into the final version of the WHO HH Guidelines.[1] One of the key findings was that active encouragement of a patient by a HCW to remind them about hand hygiene had a significant impact on the willingness of the patient to be empowered. It can be concluded from the data presented that patients have always been willing to be empowered.

In 1999, McGuckin *et al*.[5] demonstrated success in their first study using a programme called 'Partners in Your Care', a hand hygiene and patient empowerment programme that included knowledge, visual reminders and explicit directions for patients to ask their HCWs to wash/sanitize, and measurement of hand hygiene compliance. Several studies of similar programmes followed, but often lacked the simple component of explicit permission. They also used self-reporting as a measurement, and as a result, believed that patients were not willing to be empowered.

Table I lists studies from 1997 to 2012 conducted in various regions or countries, showing that there has been a steady increase in the number of countries looking at the willingness of patients to be empowered and the importance of HCWs giving explicit permission.

Following publication of the WHO HH Guidelines,[1] the research from 2008 to 2012 saw advances in how to empower patients and recognize when they are not engaged, as well as an emerging focus on the roles and attitudes of HCWs towards empowerment.

2008–2012

In 2010, Longtin *et al*. published a comprehensive summary on patient participation as it applies to the efficacy of patient participation in decision-making and self-treatment of chronic illness. The authors suggested that patient participation could be useful to improve quality of care and prevent medical errors. They identified two important components that need to be in place in order to succeed with patient participation: 'buy-in' by the HCW of the value of participation, and consideration of the sociodemographic profile of the community. They stated, 'When both health care worker and patient support are secured, positive feedback will emerge from the patients and contribute to the safety of health care'.[22]

At a Veterans Affairs hospital in the USA, Lent *et al*. instituted the 'Partners in Your Care' programme[6] using a printed script that encouraged patients to 'ask' their HCWs to wash/

Table I

Patient willingness to be empowered, to ask about hand hygiene, and whether they were given permission by their healthcare workers to ask if they have performed hand hygiene. Updated from WHO Guidelines on Hand Hygiene in Health Care (p. 256)

Study origin	Patient believes he/she should be involved	Patient would ask about hand hygiene	Healthcare worker gave permission to patient
England and Wales NPSA (2004)[a]	71%	26%	-
Ontario (Canada)[b]	32%	42%	-
USA consumer survey[c]	-	-	80%
USA web survey[d]	-	60%	-
World Health Organization survey[e]	-	52%	86%
UK[f]	79%	-	-
USA[g]	91%	45%	-
UK[h]	-	-	Significant increase
Switzerland[i]	-	33%	81%
Australia[j]	90%	40%	-

[a] *Patient empowerment*. London: National Patient Safety Agency; 2008. Available at: http://www.npsa.nhs.uk/cleanyourhands/in-hospitals/pep/ (last accessed 1 December 2008).

[b] Zorzi R. *Evaluation of a pilot test of the provincial hand hygiene improvement program for hospitals – final report*. Toronto: Cathexis Consulting Inc.; 2007.

[c] McGuckin M, Waterman R, Shubin A. Consumer attitudes about health care-acquired infections and hand hygiene. *Am J Med Qual* 2006;**21**:342–346.

[d] Aleccia J. *The dirty truth about docs who don't wash: patients shouldn't be shy about asking providers to hit the sink, experts say*. Seattle: MSNBC; 2008. Available at: http://www.msnbc.msn.com/id/22827499 (last accessed 26 November 2008).

[e] World Health Organization. *WHO guidelines on hand hygiene in health care*. Geneva: World Health Organization; 2009.

[f] Duncanson V, Pearson LS. A study of the factors affecting the likelihood of patients participating in a campaign to improve staff hand hygiene. *Br J Infect Control* 2005;**6**:26–30.

[g] Waterman AD, Gallagher T, Garbutt J, Waterman BM, Fraser V, Burroughs TE. Hospitalized patients' attitudes about and participation in error prevention. *J Gen Int Med* 2006;**21**:367–379.

[h] Davis RE, Koutantji M, Vincent CA. How willing are patients to question healthcare staff on issues related to the quality and safety of their healthcare? An exploratory study. *Qual Saf Health Care* 2008;**17**:90–96.

[i] Longtin Y, Sax H, Allegranzi B, Hugonnet S, Pittet D. Patients' beliefs and perceptions of their participation to increase staff compliance with hand hygiene. *Infect Control Hosp Epidemiol* 2009;**30**:830–839.

[j] Reid N, Moghaddas J, Loftus M, *et al*. Can we expect patients to question health care workers' hand hygiene compliance? *Infect Control Hosp Epidemiol* 2012;**33**:531–532.

sanitize their hands or, in a separate group, 'thank' their HCWs for washing/sanitizing their hands. They only gave visual reminders to patients who said they were too shy to speak up. The authors used self-reporting by the patients as a way to measure success, and reported 3% compliance for patients who asked their HCWs and 45% compliance for patients who thanked their HCWs.[23] Longtin *et al.* surveyed 194 patients from an institution in which there was a multi-modal programme that did not include a patient empowerment component. They reported that an explicit invitation from a HCW to ask about hand hygiene doubled the patient's intention to ask a nurse (from 34% to 83% of respondents) and a physician (from 30% to 78%).[24]

In a pilot study, Reid *et al.* gave patients a brochure about hand hygiene (empowerment step of providing knowledge) and the importance of asking their HCWs. Although over 90% of patients believed it was important and said that they would ask, only approximately 40% reported that they had actually asked at follow-up interview.[25] Ottum *et al.* gave patients an interviewer-administered questionnaire on their awareness of HAIs as well as on hand hygiene. Of the 200 patients surveyed, 99.5% believed that HCWs were supposed to wash their hands before and after caring for patients, and 90.5% believed that HCWs should be reminded to wash their hands if they forget.[26] Only 64% and 54% indicated that they would feel comfortable asking nurses or physicians to wash their hands, respectively, and only 14% of patients reported ever having asked caregivers to wash their hands. The results demonstrated that patients understand the importance that hand hygiene plays in HAI prevention, but willingness to ask a HCWs to perform hand hygiene varied among patients depending on their educational level or if they or their family members had ever been in the HCW profession.

In 2010, the Swiss Patient Safety Foundation released a systematic review for the period 1995–2008 on patient engagement. The main aim of this review was to assess and summarize the evidence related to patient participation in error prevention, which included a section on hand hygiene and engagement.[27] The studies cited in the hand hygiene section were those of McGuckin *et al.*[5,6] in which 50–60% of the patients reported that they had asked their HCWs to wash/sanitize their hands. The authors felt that the increase in staff compliance may have been related to behaviour change in the sense that patients expected hand washing, and the HCWs intended to comply with these expectations. This suggested rationale for increased compliance was given additional support in a 2012 industry-sponsored survey that addressed patient attitudes towards hand hygiene in a healthcare setting in the USA. They reported that 40% of patients said they did not ask because they assumed healthcare professionals perform hand hygiene before treating any patient.[28]

Patient input in programme development

1997–2007

In 2001, the National Patient Safety Foundation Advisory Council in the USA took up the concern about consumer involvement, and developed a new programme with input from patients and families, titled 'Patients and families in patient safety: nothing about me, without me', as a call to action for healthcare organizations at all levels to involve patients and families in systems and patient safety programmes problems.[29] However, despite this initiative to be sure patients and consumers were involved in developing programs, two years later a report by Entwistle[30] found that this was not being followed in the USA. They looked at five leading patient safety directives in the USA, and reported that the programmes had been developed without input from patients, lacked information about what HCWs needed to do, and did not include what support should be given to patients.

In 2004, WHO launched the World Alliance for Patient Safety to raise awareness and political commitment to improve the safety of health care in all Member States. A specific programme, 'Patients for Patient Safety',[31] was designed to ensure that the wisdom of patients, families, consumers and citizens, in both developed and developing countries, is central in shaping the work of the Alliance. At the time of publication of the WHO HH Guidelines,[1] there were 10 counties/territories with national strategies for hand hygiene programmes/campaigns that encouraged patient involvement. Four years later, as a result of the materials provided by WHO to support the HH Guidelines, 48 countries had initiated their own hand hygiene campaigns.[32]

2008–2012

In May 2012, the Agency for Healthcare Research and Quality in the USA released the 'Guide to Patient and Family Engagement' to help hospitals develop teams that include input from patients/consumers. In presenting the role of the patient/consumer, they noted that by creating patient and family advisory councils, patients and family members can participate as advisors in organizational development. Although true engagement may include patients and family members as partners in decision-making, not all organizations will feel comfortable allowing this. Creating the council may be a first step, and with continued success, later steps could allow patients and family members to have more power at the organizational level.[33]

Patient input programmes have an impact; however, more programmes from more countries need to assess their methods and submit this for peer review, so that scientific examples can continue to be evaluated and models can advance into the future.

Barriers to patient empowerment

1997–2007

A significant factor often perceived by the patient is the fear of a negative impact/response from their HCWs.[34] This barrier was explored in an acute care rehabilitation unit where patients are often dependent on their HCWs for activities of daily living. The authors reported that 75% of patients were comfortable asking their HCWs, 'Did you wash/sanitize your hands?'[18] Although HCWs are trained and motivated to provide the best care possible, they are often faced with barriers that are more system-related than behavioural. Empowering a patient covers issues that go beyond decision-making, and involves more individual interests and cultural parameters. Acknowledging different views on patient empowerment and dealing with them in the context of an organization, culture or community will be necessary when removing barriers to patient empowerment, involvement or participation in hand hygiene compliance.

2008–2012

The amount of research on barriers in specific, real-world settings has proliferated. Longtin *et al.* looked at caregivers' perceptions of patients providing reminders to improve hand hygiene, and their results will most likely shape our direction for patient empowerment. They surveyed HCWs from University of

Geneva Hospitals in order to evaluate the level of acceptance of wearing a badge to invite patients to ask about hand hygiene, and they assessed the variables associated with the support of patient inquiry. They found that out of 277 respondents, 29% of HCWs did not support the idea of being reminded by patients to perform hand hygiene, although 74% of respondents said that they believed that patients could help prevent HAIs. Twenty-seven percent of respondents said that hand hygiene inquiry was not part of the patient's role. Thirty-seven percent said that they would not consent to wearing a badge inviting patients to ask about hand hygiene. The most interesting finding was that 44% of respondents said they would feel guilty if patients discovered that they skipped hand hygiene, and 43% said they would feel ashamed to disclose such a fact.[34]

In a different study, Longtin *et al*. discussed the reasons why patients would not ask about hand hygiene, based on an open-ended question in a questionnaire given to 194 patients (mentioned previously in this article). The main reasons were the perception that caregivers already know (or should know) when to perform hand hygiene, the belief that asking about hand hygiene is not part of the patient's role, and a feeling of embarrassment or awkwardness associated with asking about hand hygiene. The fear of reprisals was mentioned more frequently as a reason not to intend to ask a nurse compared with a physician (11.6% vs 3.2%, respectively).[24]

Rohit *et al*. conducted an anonymous survey asking 209 medical students the same question, 'Would you speak up to prevent healthcare-associated infections, more specifically, would you ask about hand hygiene?' Eighty-four percent said that they would ask fellow students to wash/sanitize their hands. This percentage decreased as the rank of the doctor increased [interns (30%), residents (16%), registrars (9%), consultants (6%)]. The primary reason why students would not speak was a reluctance to question senior staff, followed by an unwillingness to interrupt or embarrass them.[35] The Lucian Leape Institute has argued for urgent reform in medical education through the creation of learning cultures that help students acquire not only core medical knowledge and clinical skills, but also the attitudes and behaviours that allow them to function safely in clinical settings.[36]

Table II is a checklist of six factors to be addressed when introducing patient empowerment into a multi-modal hand hygiene programme.

Summary of results

In summary, several studies have shown that, at least in principle, patients are willing to be empowered. However, the actual number of patients that will practice empowerment as it pertains to hand hygiene is varied and ranges from 5% to 80%. The actual performance of patient empowerment can be increased when a patient is given explicit permission by a HCW. The literature also suggests that HCWs recognize that patient empowerment can prevent medical errors, but have yet to embrace a primary tenant of empowerment: giving explicit permission.

While earlier research demonstrates success with patient empowerment and hand hygiene, more recent research focuses on patient willingness to be empowered, or on the HCW's role (or willingness) to instil patients with the knowledge, skills and attitudes to be partners in the healthcare delivery process. Patient empowerment interventions and models have, for the most part, not been conducted as randomized controlled trials, controlled clinical trials, controlled before-and-after studies and interrupted time series analyses. At this point, it is not possible to say with scientific certainty that patient empowerment as a single intervention will increase hand hygiene.

However, there is support that including patient involvement in a multi-modal programme that also includes HCW empowerment and explicit permission can increase compliance. The questions that face research moving forward are: (1) Do we need randomized controlled trials? (2) Do we try to develop new theories on why empowerment might not work? (3) Do we build on proven interventions such as multi-modal hand hygiene programmes with educational interventions that stress accountability and empowerment? (4) Do we educate our consumers so that they believe they can impact their healthcare experience when they become patients?

Do we have enough evidence to move patient participation from 'feasible' to 'necessary'? Studies show increases in hand hygiene compliance and patients are willing to play an active role. It is feasible. One must not get distracted by looking for reasons why patient empowerment does not work. Instead, the focus should be on programmes that build on the desire and interest already proven.

Table II
A simple strategy for developing a culture of shared responsibility to support patient empowerment and hand hygiene compliance

☑ Ensure a multi-modal hand hygiene compliance programme, including routines for education, measurement and feedback, is in practice at your institution. See World Health Organization's Guidelines on Hand Hygiene in Health Care (2009).
☑ Review research on the willingness of patients to be involved in hand hygiene reminders. Note facts and/or programmes with proven success. Note barriers.
☑ Review research on healthcare workers' role, perceptions and willingness to empower patients. Note successes and barriers.
☑ Evaluate research/programme success and barriers for patients' and healthcare workers' willingness, and note where successes can apply to your institution and where barriers might arise at your institution.
☑ Identify champions, or supervisory role models, within different healthcare delivery roles who will be supportive of empowering patients and assisting with healthcare workers' acceptance of their role in empowerment. Consider champions who can build on the successes (noted above) or who can help you with barriers (noted above) at your institution.
☑ With your strategy devised and champions identified, introduce concept to key decision makers, showing you can apply proven success to your institution, assuring that you have predicted and addressed barriers to implementation, and have identified role models to assist in improving the culture of responsibility for improving hand hygiene.

Programmes, models and interventions for patient empowerment and hand hygiene

The following review of programmes that have used empowerment has been limited to published articles and reports in which there was some form of evaluation for hand hygiene as a separate outcome or as part of a multi-faceted programme. These programmes were reported in the WHO HH Guidelines – Programmes for Empowerment in the context of hand hygiene improvement, and can be categorized into educational, motivational (reminders/posters), role modelling and patient as observers within the context of a multi-modal approach.

Educational programmes

Hand hygiene information for patients can be in the form of printed matter, oral demonstrations or audio-visual means. In their patient empowerment model, McGuckin *et al*. educated patients about hand hygiene by using brochures that asked the patient to be a partner with their HCWs, and reported that 80–90% of patients reported that they had read the educational brochures.[5,6] Petersen *et al*.[37] developed a promotional campaign that included educational brochures for patients on hand hygiene, as well as bottles of alcohol-based hand rub. Although patients were encouraged to speak up about hand hygiene, the authors reported an overall increase of only 10% in compliance, but believed this was attributable to limitations in their observation technique. Demonstration, as a form of education and empowerment about hand hygiene, was evaluated and found to increase awareness and compliance.[38] Chen and Chiang compared the use of a hand hygiene video with illustrated posters to teach hand hygiene skills to parents of paediatric intensive care patients and to empower them about their role in hand hygiene. They reported a steady sustained increase in compliance and empowerment by parents attributable to a strong motivation to protect their child.[39]

The US Centers for Disease Control and Prevention has produced podcasts that can be used on admission for visitors. The messages emphasize two important facts: (1) knowledge: the importance of practising hand hygiene while in the hospital, and the appropriate action of asking or reminding HCWs to do so; and (2) action: giving the patient explicit permission to ask or remind.[8] Although there are no data to determine how or if healthcare facilities are using this format, it is an example of giving explicit permission.

Empowering patients about patient safety issues using Internet sources such as home pages for hospitals or national agencies has become part of many hospital systems as a result of mandatory reporting of quality and safety. When 32 consumer participants were introduced to five Internet sources on quality care in order to educate them about patient involvement, they reported a significant improvement in test scores after exposure to the Internet sources.[40] The studies described are from healthcare settings in developed countries.

Reminders and motivational messages

Patient empowerment models often include visual reminders for both the HCW and the patient.[5,6] These visual reminders usually include small badges or stickers worn by patients with a message such as 'Did you wash/sanitize your hands?' A multi-centre, one-year evaluation of a model using education and reminders as a route to empowerment found a significant increase in hand hygiene compliance, with the model working equally well for all sizes of hospitals and unit types.[41] Posters, another form of reminder, are used in hand hygiene programmes and campaigns to educate and empower HCWs as well as patients. An evaluation of 69 hand hygiene posters representing 75 messages found that only 41% framed the message for motivation, empowerment and health promotion. Similar findings were reported from a poster campaign in a paediatric intensive care unit (ICU) to encourage both HCWs and patients/visitors to practice hand hygiene.[42] If the message is framed correctly, posters can serve as a visual reminder and encouragement for both patients and HCWs to participate in hand hygiene practices.

Educational videos, posters, brochures and visual reminders targeted to educate HCWs and patients were evaluated in three long-term care facilities as part of a comprehensive hand hygiene programme. This combination of HCW education and patient empowerment resulted in an aggregate increase in hand hygiene compliance of 52% and a 32% decrease in infections.[43] The use of individual hand sanitizers at the point of patient care or given to the patients can also be seen as a form of reminder. Pittet *et al*. reported on inviting patients to remind HCWs about hand hygiene through the provision of individual alcohol-based hand rub containers and actively supporting an 'It's OK to ask' attitude. This combination of education and reminder was perceived as the most useful intervention by both patients and HCWs, and should be evaluated further.[44]

Role modelling

Role modelling in which a HCW's behaviour towards hand hygiene is influenced by either peers or superiors has been shown to influence compliance and motivate the patient to be empowered.[45–48] McGuckin *et al*. reported an increase in hand hygiene compliance and use of alcohol-based hand rub by using 'authority figures' as role models for empowerment.[45] The medical director, nurse manager, director of nursing and infection control professional dedicated to the medical/surgical ICU recorded short audio messages about hand hygiene, such as 'We want 100% compliance with hand hygiene in our ICU' and 'Remember to use sanitizer' that were broadcast at randomly timed intervals from the announcement speakers at the nurses' station. Christensen and Hewitt-Taylor[49] questioned the use of empowerment for the ICU patient, and suggested that patients need to have control restored before they can be empowered. Lankford *et al*.[47] reported that a HCW's hand hygiene behaviour was influenced negatively when the HCW was in a room with a senior staff member or peers who did not perform hand hygiene. Sax *et al*.[46] identified social pressures that could be considered a form of role modelling as highly ranked determinants of good hand hygiene adherence: the influence of superiors and colleagues on staff and patients.

Patients as observers

In keeping with the idea of empowering patients to remind their HCWs to perform hand hygiene, recent reports have shown that patients may, in fact, also be a very cost-effective way to monitor compliance by being observers.

Johns Hopkins Outpatient Centre, an ambulatory centre, engaged patients as observers in monitoring hand hygiene compliance. Fifty patients were initially interviewed to determine their willingness to be observers. They reported that

86% of patients responded that they would be willing to be a hand hygiene observer. Of those, all (100%) would be willing to complete the observation card. Twenty-four (55.8%) of the 43 patients indicated that they would feel comfortable speaking up if they saw the provider did not follow proper hand hygiene protocols. However, the mean response rate, defined as the number of survey cards returned from a specific practice divided by the actual number of patients seen in that practice during the survey period, was 22%. One can speculate from this low response rate that only those who actually observed and asked, filled out the card.[10] Using patients as observers may be most effective in settings such as ambulatory care, in which patients are relatively healthy.

Automation

Interventions that provide varying degrees of automated compliance monitoring are being tested, and introduced, to the healthcare device marketplace. McGuckin and Govednik produced a summary of such interventions in a descriptive guide for the infection prevention team.[50] These systems integrate electronic and data networking tools for monitoring, reporting and feedback to HCWs on their hand hygiene performance.

Some interventions supplement the efforts of HCWs to monitor and provide feedback with data recording and networking. An example would be the use of a tablet-style computer or smart phone to input staff observations of hand hygiene behaviour, and using analytical software to generate compliance reports that can be customized by the user. This eliminates the need for transferring paper data to the computer and manual analysis. Other systems integrate hardware such as identity/alert badges worn by HCWs and sensors placed around the patient care area, sinks and hand hygiene product dispensers. These systems offer more automation for data gathering and reporting, as a human need not be present for data to be recorded, compared with direct observation methods. Most interventions require capital investment of the hospital such as hardware purchases, networking and electricity infrastructure, additional resources for materials management (battery replacement and training), or requirements to purchase specific soap and sanitizer products that meet manufacturers' specifications as part of an integrated intervention system.[50]

The body of peer-reviewed research on the clinical trials of these automated or semi-automated interventions is growing. Granado-Villar and Simmonds demonstrated the reliability of wireless communications between sensors in a patient room, sink area and the HCW's identity badge, suggesting that the system recorded data with 100% accuracy and the technology could be applied within the physical layout of a healthcare facility.[51] Cheng *et al*. tested a similar system for its capabilities, and used the trial to compare compliance between nurses who had been assigned an identity badge with those who shared badges. If an individual HCW was assigned a badge, the data were attributed to his or her personal performance. If a badge was shared among two or more HCWs, the data were reported anonymously as the network did not know who was wearing a badge during which work shifts. Compliance was lower for the anonymous group (24% vs 34–36% for identified nurses).[52] This study is an example of focusing not only on the technology but how human HCWs will react to it (in this case, the impact of HCW identification). Yarbrough *et al*. compared hand hygiene compliance rates and HAI rates in a same-hospital, year-to-year study, before and after an automated intervention was implemented. Their results suggest a 22% decrease in HAI markers for year-to-year comparisons. They attributed the results to a combined hand hygiene programme of training, education and messaging that was part of the trial system.[53]

The body of research is almost as varied as the types of systems available. Some research is peer reviewed in healthcare infection journals and health science abstracts, other research is published in 'wi-fi' or similar technology-focused journals or abstracts. When considering a research source, in addition to the attention given to the methodology and results, interested readers should consider the nature of the article. For example, an article in a technology journal that praises the advancement of wireless technology in a hand hygiene monitoring system might focus more on the type of technology used than compliance results or impact on HAI rates.

As they pertain to patient and HCW empowerment, the authors did not identify any research on how patients interact with and use an automated or semi-automated system. When a HCW's sensor badge shows a red light for not complying with hand hygiene, will the patient or another HCW speak up? If the badge provides an alert for a missed hand hygiene opportunity, can the alarm be over-ridden by the HCW without complying? What type of feedback has the best impact on compliance? Real-time? Weekly? Individual? Group? More is known about these systems from a data and capabilities discussion, and not from an empowerment or real-world perspective; more research is needed focusing on the latter.

Summary

This review has attempted to summarize and update the work developed by WHO as part of the WHO HH Guidelines. There is ongoing support from patients that they are willing to be empowered. There is a need to develop programmes that empower both HCWs and patients so that they become more comfortable in their roles.

Fifteen years ago, when the concept of patient empowerment was first introduced, there was a great deal of doubt, but this review shows: (1) that evidence exists showing that patients want to be empowered, and (2) HCWS need to help their patients by providing explicit permission.

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