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BMJ Open Ethnographic study using Normalization Process Theory to understand the implementation process of infection prevention and control guidelines in Ireland

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ABSTRACT

Objective The aim of this study was to explore how infection prevention and control (IPC) guidelines are used and understood by healthcare professionals, patients and families.

Design Ethnographic study with 59 hours of non-participant observation and 57 conversational interviews. Data analysis was underpinned by the Normalization Process Theory (NPT) as a theoretical framework.

Setting Four hospitals in Ireland.

Participants Healthcare professionals, patient and families.

Results Five themes emerged through the analysis. Four themes provided evidence of the NPT elements (coherence, cognitive participation, collective action and reflexive monitoring). Our findings revealed the existence of a 'dissonance between IPC guidelines and the reality of clinical practice' (theme 1) and 'Challenges to legitimize guidelines' recommendations in practice' (theme 3). These elements contributed to 'Symbolic implementation of IPC guidelines' (theme 2), which was also determined by a 'Lack of shared reflection upon IPC practices' (theme 4) and a clinical context of 'Workforce fragmentation, time pressure and lack of prioritization of IPC' (theme 5).

Conclusions Our analysis identified themes that provide a comprehensive understanding of elements needed for the successful or unsuccessful implementation of IPC guidelines. Our findings suggest that implementation of IPC guidelines is regularly operationalised through the reproduction of IPC symbols, rather than through adherence to performance of the evidence-based recommendations. Our findings also provide insights into changes to make IPC guidelines that align with clinical work.

BACKGROUND

The purpose of infection prevention and control (IPC) guidelines is to prioritise and provide clarity around the core components of IPC programmes aimed at preventing and controlling healthcare-associated infection (HCAI).¹ Numerous guidelines exist² but are

Strengths and limitations of this study

- The ethnographic approach allowed an in-depth analysis of infection prevention and control (IPC) guidelines within the context of Irish hospitals.
- The innovative model presented in this is the first model underpinned by Normalization Process Theory constructs to elucidate the complex reality of implementing IPC guidelines.
- This study is important because it is one of the few studies to understand how IPC guidelines can be embedded in healthcare workers' everyday practice.
- A limitation of ethnographic studies is the risk of researcher bias, which we tried to reduce by having a multidisciplinary research team collecting and analysing data from observations and interviews.
- The sample were drawn from four healthcare organisations in one country which limits the generalisability of study findings.

poorly implemented.^{3 4} Limited availability of IPC resources and access to expertise in implementation science are barriers. The WHO recommends exploring implementation strategies to improve uptake of clinical guidelines.¹

Implementation of guidelines focuses on establishing standardisation of evidence based practices. How guidelines are integrated into routine clinical practice needs to be understood from the perspectives of both the individual and the collective.

Current studies on implementation of IPC guidelines and practices have provided insights on how to overcome barriers⁵ and methodological and theoretical approaches to translate IPC evidence into practice.⁶ However, few studies have applied a theory, such as the Normalization Process Theory

(NPT),⁷ to explain how IPC interventions are embedded in practice.⁸

NPT is an ecological theory developed to explore and understand how complex interventions are operationalised.⁹

The justification for applying NPT to explore how IPC guidelines are used and understood by healthcare professionals is that this theory offers explanations of the mechanisms that drive implementation processes, and focuses on observable action, rather than presenting a list of factors that need to be taken into account in some way. It provides a set of tools to explain the social processes through which new or modified practices of thinking, enacting and organising work are operationalised in institutional settings.¹⁰

NPT sets out a three-stage model of implementation, embedding and integration, and is organised around a set of practical questions that developed through three iterations of theory building: (1) What factors promote or inhibit the routine incorporation of complex interventions in practice? 2) What factors promote or inhibit the implementation, embedding and integration of practices? (3) What factors promote or inhibit the mobilisation of structural and cognitive resources for implementation? NPT has contributed to the field of complex interventions by informing empirical research on the core mechanisms of implementation processes, and also by explaining how these processes are formed and structured.¹⁰

The theory identifies four determinants that embed (ie, normalise) complex interventions into practice:

- ▶ Coherence: individuals must individually and collectively understand what the new way of working is.
- ▶ Cognitive participation: individuals must agree to start engaging with the new model of care, and continue working at it.
- ▶ Collective action: individuals need to have the resources to work in the new way.
- ▶ Reflexive monitoring: individuals need to receive feedback that reinforces the new way of working.

NPT has been applied across a wide range of interventions¹⁰ in different healthcare settings.¹¹

The aim of this study was to explore how IPC guidelines are used and understood by healthcare professionals, patient and their family members using an ethnographic approach underpinned by NPT.

METHODS

Study design

We conducted an ethnographic study to 'go beyond the technical issues and consider the context influencing the uptake of evidence-based strategies'.⁶ (p1062) Our rationale was to examine HCAI guideline implementation by moving beyond the narrow focus of implementation success/failure and explore how and why guidelines are or are not implemented. This approach demonstrates factors that contribute to, or impede implementation of HCAI guidelines in clinical practice.¹²

Setting of the study

Data were collected in four hospitals in Ireland. These were purposively sampled to represent a range of clinical settings of varying sizes, geographical location and patient populations; these included patients that required emergency as well as acute and long-term care.

Site 1 is a rehabilitation hospital for older people with 89 beds. At this site, data were collected in long stay care wards. Site 2 is a 1000-bed regional centre for secondary and tertiary care with a catchment population of 550 000 and a supraregional centre for a total population of 1.1 million. There are 63 444 emergency admissions, 300 400 outpatient attendances, 45 493 inpatient discharges and 80 938 day cases annually. Data were collected in the trauma floor and emergency department of the hospital, and there were isolation rooms in both these settings.

Site 3 is a 314-bed hospital providing secondary and tertiary care serving a population of 870 000 people; data were collected in the emergency department in this site. Site 4 is a 192-bed hospital catering for 38 400 admissions and 72 500 outpatient attendances annually; this setting provides both secondary and tertiary care. Data were collected in the trauma, rehabilitation and ophthalmology units for inpatient and day cases.

Data collection and participants

Non-participant observations and conversational interviews were undertaken by HA, FB, AB, SC, MS, SM, JH and TW with healthcare professionals, hospital staff, health students, patients and their family members guided by an observational tool based on NPT constructs and developed especially for the study (online supplementary file). Data collection took place over 3 months in 2018. Observational periods lasted 85 min on average at busy times, including shift changes and before, during and after care. Observations involved a range of patients, relatives and healthcare professionals and took place during mornings, afternoons, evenings (from 08:00 to 20:00 hours), weekdays and weekends.

For the conversational interviews, an interview schedule was developed through discussions with the project team, pilot work with videos of clinical settings and the literature (online supplementary appendix 1). We did not use interviews and observation in parallel to answer the same research question. Therefore, we did not perform triangulation to assess consistency between both. Interviews were used to seek explanations for observed actions in practice. The interactions and relationships between the interview schedule and the observation tool were crucial to allow data integration in light of the NPT constructs.

The data collected comprised:

- ▶ 59 hours of non-participant observations.
- ▶ 57 conversational interviews: seven with patients and their family members (five patients without infection, one relative of a patient in protective isolation, one relative of patient without infection) and 53 healthcare professionals, hospital staff and health students

(27 nurses including an IPC nurse, paediatric nurse, clinical nurse managers, newly qualified and advanced nurse practitioners, three nursing students, three medical students, one physiotherapy student, three household staff, four household staff, two occupational therapists, two physicians, six healthcare assistants, two radiographers).

Interviewees were identified during the observational phase of the research when the researchers saw an IPC action that warranted further exploration in a follow-up conversation with the healthcare professionals or patients. This real-time approach allowed a contact with a diversity of professional groups and patients involved in or impacted by IPC.

Field notes were taken during observations; in addition, diagrammatic mapping was employed and the researchers sketched the layout of the healthcare setting in each study site. These sketches provided a description of physical infrastructures such as location and distance of hand hygiene facilities, and physical layout of ward providing information on the position of 'dirty' and 'clean' utility rooms, and availability of equipment (eg, alcohol gel).

Data analysis

Data from fieldnotes and sketches of healthcare settings were transferred to Nvivo software V.11, coded, analysed by HA and discussed with the research group. Briefing and debriefing sessions with the research team were held pre and post each of the three data collection rounds to redefine the main foci for the next round of data collection.¹³ Data were analysed using open coding, constant comparison and interpreted in the light of NPT.

Initially, briefing sessions were focused on the overview of the project, its objectives and discussion of published accounts on IPC, implementation of guidelines and NPT. The objective was to develop a collective and shared theoretical understanding when undertaking a team ethnography using NPT. Debriefing sessions enabled the team to share data thus enhancing internal validity.

Patient and public involvement

There were no patients involved in the development of the research question, the recruitment and the conduct of the research. There was a representative of a patient advocacy group on the research steering group who gave feedback on the general research design. Knowledge users (nurses working in clinical practice, a microbiologist, a physician, healthcare policy makers) were represented within the research group. Patients and their relatives were participants in the field research.

RESULTS

Our findings describe data from observations and their real time follow-up interviews. Overall, our findings demonstrate that users did not regard the IPC guidelines as legitimate constraints on their activities (cognitive

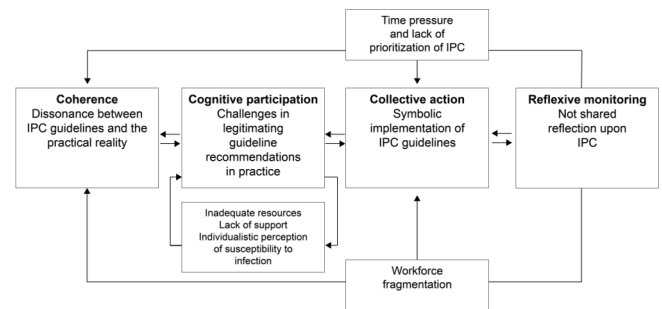


Figure 1 Model outlining the complex reality of implementing infection prevention and control (IPC) guidelines underpinned by Normalization Process Theory (NPT) constructs.

participation) and that IPC guidelines were not interactionally workable (collective action) for them. Therefore, they did not enact these guidelines; instead they constructed an alternative set of meanings for their IPC work, that gave this symbolic rather than practice significance.

The results of analysis revealed interconnected themes pertaining to the implementation of IPC guidelines which resonated with the constructs of NPT:

- Coherence: Dissonance between IPC guidelines and the reality of clinical practice.
- Collective action: Symbolic implementation of IPC guidelines.
- Cognitive participation: Challenges to legitimatise the guideline's recommendations in practice.

Two themes were identified that described the determinants for symbolic implementation of IPC guidelines:

- Reflexive monitoring: Lack of shared reflection on IPC practices.
- Workforce fragmentation: time pressure and lack of prioritisation of IPC among healthcare staff.

The relationship between these themes is depicted in figure 1 (online supplementary appendix 2); this illustrates how NPT constructs underpin the analysis of our empirical account. Similar to the four NPT constructs,¹⁰ the themes interact dynamically and non-linearly to provide an explanation of IPC guideline implementation.

Overall, coherence and cognitive participation influenced (and were influenced) by collective action: either shaping staff and patient's behaviours towards implementation, or inhibiting professionals, patients and their family members in their enactment of guidelines. A sense of 'dissonance between evidence and local practice' alongside existing 'challenges to legitimize guidelines' recommendation in practice' shape a 'symbolic implementation' of IPC guidelines'. Implementation was often operationalised by reproducing IPC symbols, rather than through adherence to evidence-based recommendations. Lack of shared reflection on ICP practice, workforce fragmentation and time pressure further triggered the symbolic implementation of IPC guidelines.

We highlight essential aspects that could promote a shift from symbolic to actual implementation including

facilitators such as interventions to promote alignment of evidence with local practice, IPC education, audit and regular procedures to monitor practice.

Coherence: dissonance between IPC guidelines and the local practice

The process through which participants share and create an understanding of IPC guidelines varied across settings. Overall, participants described dissonance between IPC guidelines and the practical realities of working in health-care. Within our data, participants working on a long-term care unit expressed their opinion (in interviews) that the unit was a low-risk environment and IPC recommendations could be overlooked in this setting:

IPC is not a priority here [...] It is neither acute hospital nor a residential facility. We can forget to wash our hands because the patients are not acutely unwell. (Occupational therapist)

In acute wards, IPC guidelines were not perceived to be fit for purpose and were dismissed. During observations, non-compliance with IPC guidelines was noticed. Some staff regarded the guidelines as not up to date and failing to integrate information on emergent issues:

[...] I'm not sure how much importance is on them (guidelines) really. For example, there is supposed to be an emergency now about carbapenemase-producing *Enterobacteriaceae* (CPE), but the public know nothing about it. (Nurse)

In an emergency department staff prioritised clinical needs over IPC guidelines, stating that:

there are no beds on wards to discharge to, infection prevention is not a priority. (Nurse)

Therefore, staff often overlooked the guidelines because they were perceived to conflict with delivery of care to acutely ill patients.

Cognitive participation: challenges in legitimatising guideline recommendations in practice

Cognitive participation requires the participant's motivation in trying to incorporate the intervention and how well the intervention fits in with existing tools and approaches. One subconstruct of cognitive participation is 'Legitimation'; the belief that guidelines fit the context according to what healthcare professionals value. It influences the decision-making that promotes activation of a practice, instigating collective efforts by which IPC guidelines could be implemented. Our findings revealed that participants face challenges in legitimating guideline recommendations in practice due to: (1) lack of support, (2) inadequate resources and (3) individualistic perception of susceptibility to infection.

Lack of support

Participants repeatedly referred to their responsibility to implement IPC guidelines, citing awareness of infection

control as their main motivation (in interviews). However, implementation seemed to be undermined by a feeling of insufficient support from management. This occurred most often in emergency departments:

In general we get no support from management in relation to IPC and indeed other issues—we are the septic tank of the system—beds are closed elsewhere in the hospital but not here. (Clinical nurse manager)

Inadequate resources

In all sites, resource issues were noticed (during observations) including problems with the physical environment (eg, not enough isolation beds, equipment), overflowing waste bins and alcohol gel not replaced. Conversations with staff revealed how their 'buying in' attitude towards implementation of guidelines was significantly framed by context. The following is an example from a nurse working in a trauma rehab unit:

The guidelines are ok to implement [...] Yes, we have enough time and resources. (Nurse)

Resource constraints diminished motivation and compliance was then considered impossible. Compliance with IPC guidelines was not considered feasible in emergency settings, for example, (during observations) it was noticed trolleys on corridors, positioned very closely together with limited access to hand hygiene resources. The following is an example from an emergency department:

Impossible (to implement IPC guidelines). Isolated patients are in the interview room, the psychiatric room or the family room. There are no beds on the wards to discharge them to. Cubicles that are designed for one trolley have two trolleys in them. Makes correct IPC impossible. Situation impossible to manage infection. (Clinical nurse manager)

Another challenge staff and patients encountered with legitimating IPC guidelines was lack of educational resources. Training was described (in interviews) as a potential opportunity to create shared understanding between professionals and promote engagement in IPC practices but was not available in all settings.

Observations identified that hand hygiene posters and signage relating to patients in isolation were visible throughout all sites and were the most reported educational resources. However, a lack of clarity and availability of posters were highlighted by participants (in interviews). A visitor found posters difficult to understand, and language was a barrier to patient engagement in IPC as this quote from a visitor/family member in a trauma unit highlights:

Yes, (I could contribute) if somebody had explained it to me or handed me a list of instructions. [Visitor pointed out signs on door stating 'protective

isolation’]. Visitor said it wasn’t clear. “It should be bigger and in red. This is all so confusing”.

Individualistic perception of susceptibility to infection

When healthcare professionals or patients focused only on their own susceptibility to infections, they tended to endorse symbolic implementation of IPC guidelines instead of contributing to collective monitoring of implementation. An individual perspective to susceptibility to infections can supersede compliance to guidelines and lead to lack of engagement. A patient illustrated this idea by reporting his reaction to an episode of non-compliance. The patient observed a health professional moving between patients without changing gloves. When asked about his reaction, the patient stated: ‘I said nothing’. The researcher explored his decision about having ‘said nothing’. The patient further explained (in interview):

I said nothing because I had no open wound. I would have said something if I had an open wound. (Patient)

Collective action: symbolic implementation of IPC guidelines

‘Symbolic implementation of IPC guidelines’ is the idea that healthcare professionals and patients perform actions based on symbols that represent IPC practices. The data (from observation) revealed that these symbols of IPC can be resources or procedures such as hand sanitising zones and hand hygiene. The way people interact with symbols indicates how IPC guidelines are operationalised in practice. When implementation is symbolic, individuals tend to be more concerned about an objective representation of IPC, the symbol, than about how to ensure IPC effectiveness, as described in interview:

I know I should always wash my hands

Researcher: Are you familiar with any guidelines in relation to handwashing?

Physiotherapy student: No, I just know that I should do it. (Physiotherapy student)

During observation we noticed that often staff decontaminated hands (reproduce a symbol) without adhering to the five moments of hand hygiene which indicate when hands should be cleansed in the sequence of care.¹⁴ Staff were observed holding their hands high as they walked past the researcher demonstrating to others that they were performing hand hygiene but decontamination was brief (5–9s) or until the individual perceived they were out of sight. Similarly, when walls, shelving and trolleys were being cleaned, only the surface within easy reach received contact. In addition, the way resources are used can be symbolic: access to alcohol dispensers was frequently blocked by trolleys or obscured by curtains.

Reflexive monitoring: not shared reflections upon IPC

Communal appraisal, in co-existence with individual appraisal, leads to attempts to modify or reconstruct a practice to enable implementation. However, we noticed

that when reflexive monitoring was limited at individual level, attempts at reconfiguration of the practice rarely occurred.

Ward and emergency staff reported in interviews that collective appraisal of implementation of guidelines was not a common practice and not formalised. Collectively, IPC implementation was appraised mainly through information on occurrence (or not) of infections:

If there is an infection break-out in the ward, then we know that there is something wrong. (Healthcare assistant)

It was also identified that audits, potential opportunities for monitoring practice, were not always used for educational purposes. Participants noted that practice was changed during the audit, but reverted when it had been concluded, evidencing the Hawthorne effect¹⁵:

Hand hygiene audit today in the Unit. It is like the ‘ci-gire’ [Irish for inspector] is coming. Everyone washes their hands like crazy for the day and that’s it then. Why don’t they just come and not tell us that they are conducting an audit? (Healthcare assistant)

When asked about the division of labour to enable operationalisation of IPC guidelines, there was a consensus that IPC is everyone’s responsibility. However, data from interviews and observation revealed that clinical staff did not engage in discussion with their colleagues about problems or barriers for implementation:

The curtains are disgusting. I don’t see them being changed very often. They should have those ones that we can see when it is time to change, like plastic... (Physician)

The fact that professionals often did not receive (negative or positive) feedback on their performance in IPC practice might inhibit the reconfiguration of practice towards implementation of guidelines. Lack of regular procedures for monitoring implementation played an important role in feeding back into the purpose or meaningfulness of a practice thereby reinforcing the *dissonance* or the lack of alignment of evidence with local practice.

Workforce fragmentation, time pressure and lack of prioritisation of IPC

Staffing issues affecting workforce capacity included changes to senior staff leading to feelings of frustration and uncertainty about ‘who to ask’. Frequent changes in senior leadership roles were described in interviews as frustrating and demoralising for staff as it meant facilities, resources and procedures remained unchanged despite frequent requests.

Staff did not build accountability and maintain confidence in each other when preventing infections which was influenced by the type of work contract (agency staff perceived as less accountable) or professional group providing feedback:

Professionals from [an] agency can be good and can be bad, I've seen a nurse from agency going to the kitchen wearing an apron. (Household staff)

Nurses seem to comply most fully with guidelines—I think. The cleaners don't, and the medics do not. (Nurse)

Overall, we found (from observation) that in all settings time pressure can lead to symbolic rather than actual implementation of IPC guidelines. The need to have the work 'done' was found to lead to healthcare professionals to reproduce IPC symbols without reflecting on their effectiveness.

Although the same standards of IPC are considered good practice across clinical settings, differences in patient acuity and pace of work meant that IPC practices were prioritised or deprioritised. More collective efforts towards compliance were observed in wards compared with emergency departments. It was observed that even when staff acknowledged need for IPC, urgent care and lack of time were used to justify not applying IPC guidelines.

Alternately, staff were observed to adapt guidelines (eg, substituting hand hygiene with frequent glove use or using the patient bed or a chair to support an intravenous tray). Staff repeatedly performed standard precautions: hand hygiene, cleaned skin before venepuncture (but once only and then palpate the veins with ungloved hands after cleaning the site).

In a decision-making process, professionals collectively prioritise—producing and reproducing—the current behaviours of non-compliance or adaption of standard precautions. Some procedural deficits were acknowledged (in interviews) as being specific to the emergency environment, something that 'everybody does', hence normalising and learning from these practices instead of from IPC guidelines:

We definitely use gloves instead of washing hands, everybody does. I don't always wash my hands after taking them off. (Clinical nurse manager)

You learn to always wear gloves because you never know what's 'in there'. (Nurse)

It is important to note that the lack of prioritisation of IPC actions was not observed just in emergency units but across all settings.

DISCUSSION

This study is important because it is one of few attempts to understand how IPC guidelines are embedded in health workers' everyday practice.

Coherence

Consistent with Gould *et al.*⁸ we highlight how participants make sense of and accept change; this is important because it is likely to contribute to success and sustainability of implementing IPC guidelines. However, the

sense of dissonance between IPC guidelines and local practice illustrates negative sense making towards these guidelines. This negative perception of IPC policy corroborates Jackson *et al.*'s¹⁶ empirical work on nurses' infection prevention behaviours. In this study, nurses were keen to present themselves as knowledgeable practitioners, but did not always follow policy which they perceived to be based on 'scientific' understanding of infection.

An alternative for developing a positive sense making towards IPC guidelines is the integration of IPC recommendations within other well accepted and established clinical programmes. For example, clinical pathways for tuberculosis and HIV, which have some common core components of IPC already in place.¹

Cognitive participation and collective action

Analysis of participants' understanding of IPC guidelines revealed scepticism on the relevance of guidelines to the reality of clinical work. Negative perceptions seemed to influence collective action towards symbolic implementation of guidelines in which IPC guidance tends to be substituted by 'shortcuts' (eg, more frequent glove use). Similar findings are described by Gould *et al.*¹⁷ who suggested that 'greater persuasion may be needed to encourage those who are sceptical about the importance of hand hygiene to comply with guidelines'. The authors describe that staff with negative perceptions on the effectiveness of hand hygiene were self-contradictory as they highlighted the importance of alcohol hand-rub as being more convenient to use than rigorous handwashing, for example.

We conclude that IPC symbols are more complex than simple shortcuts to quicker and convenient IPC practices around the implementation of guidelines. Similar to the concept of 'mindlines',¹⁸ IPC symbols are learnt, legitimated, embedded and sustained in clinical settings and seemed to rely more on professional interactions and individualistic perception of susceptibility to infection. Isolated implementation of IPC symbols can be a dangerous shortcut to IPC in terms of patient safety. However, rather than discouraging implementation of these symbols, healthcare staff could be encouraged to reflect on the guidelines' recommendations before deciding to adopt a healthcare intervention or not. Some IPC interventions recommended by guidelines may not fit all healthcare settings. For example, in emergency departments, the use of clean disposable gloves is encouraged when safety is required; for example, receiving patients in resuscitation.¹⁹ In other settings, the use of disposable gloves instead of hand hygiene could represent a symbolic implementation of IPC guidance. The adaptation of guidelines to a local context covering high risk activities should be considered a priority¹ which could ultimately reduce the non-compliance with guidelines. Jeanes *et al.*¹⁹ highlight the importance of acknowledging local context and engaging stakeholders to increase hand hygiene compliance more effectively than traditional interventions.

Reflexive monitoring

The process of aligning external evidence with local priorities and practice is acknowledged within innovation literature as an essential means of enhancing compatibility of proposed change.^{20 21} However, alignment of evidence with local practice requires healthcare workers to assess and understand ways that new practices affect them and others around them, which is described by NPT as reflexive monitoring. Within this study, a lack of regular procedures for monitoring practice (eg, discussions and feedback regarding audit) seemed to have a negative impact on implementation.

International recommendations endorse monitoring, audit and feedback as an integral part of implementation, and suggest, for example, root cause analysis and information-sharing of cases of infection.¹ In this study, staff did not know much about their own infection rates; this contrasts with findings of another study applying NPT in the context of IPC.⁸

Sharing information on the prevalence/rate of HCAI in the clinical setting, could be used to trigger a reflexive monitoring process, promoting a shift from surveillance as a 'confidential issue'—as reported in our findings—to a collective responsibility. This sense of collective responsibility requires ownership (individual accountability) for infection prevention.

Ownership means that staff have access to their own metrics (eg, hand hygiene audit, antimicrobial prescribing, infection rates), contribute to data collection and act on findings. They engage in customising infection-related messages to ensure accurate and timely information and have regular meeting to discuss and learn from adverse events.⁸ Establishing ownership for infection prevention requires a core component of organisational support to staff; this enables staff to assess their own responses to the problem.²²

To move IPC guidance beyond the implementation of 'convenient' recommendations and symbolic implementation, Gould *et al*¹⁷ suggested threefold interventions for education and audit according to the level of staff opinions on the importance of hand hygiene: (1) an evangelistic message to those holding predominantly positive opinions; (2) presenting relevant evidence that hand hygiene can be effective, to those holding predominantly sceptical opinions; and (3) securing engagement among all staff.

Based on the evidence from our study, aligning IPC guidelines with local clinical context is an essential means to reduce the sense of *dissonance* and represents a critical step forward towards successful implementation. Some strategies described in the literature to promote alignment include: integration of IPC recommendations within other established programmes; and education and audit interventions acknowledging the positive and negative beliefs of staff on IPC practices. These underlying strategies can contribute to people's engagement with the implementation of guidelines thereby moving it from

symbolic to a contextualised, collective and evidence-based effort.

This ethnographic study aimed to research implementation of IPC guidelines, combining observational data with interviews to arrive at a more in-depth understanding of how IPC guidelines are used and understood by healthcare professionals, patient and their family members. This research applied a theory to explain how IPC interventions are embedded in practice. The use of NPT was helpful to keep our focus on observable actions and offered explanations of mechanisms that drive implementation of IPC guidelines.

As limitations, it is difficult to generalise with the ethnographic method, our sample were drawn from just four healthcare organisations in one country. Also, our pragmatic choice of time-limited and semistructured observations may have contributed to 'an observer effect' which would be avoided if we kept with the tradition of longitudinal ethnography, from anthropology.

Some of our results were not surprising such as the case of resources constraints. However, our study is innovative as it distinguishes between concrete and symbolic aspects of IPC in hospitals. This is actually an important finding that explains how IPC guidelines have been implemented. We believe that our findings could be highly transferable to other clinical settings and contexts. Testing it across a much wider set of settings might help us to understand non-adherence to many different kinds of guidelines and protocols.

CONCLUSION

In this paper, we present interconnected themes that provide a comprehensive understanding of elements needed for the successful or unsuccessful implementation of IPC guidelines. Our findings suggest that implementation of IPC guidelines has been operationalised mainly through the reproduction of IPC symbols, rather than through adherence to performance of the evidence-based recommendations. Our findings also provide insights into changes to make IPC guidelines align with clinical work. At a practical level, this change should be supported by stakeholder engagement and techniques for the evaluation of implementation, while taking local context into account. Future research to examine strategies for promoting reflexive monitoring of implementation of IPC guidelines would help add a knowledge base on approaches to support the implementation research agenda in healthcare.

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REFERENCES

- World Health Organization. Guidelines on core components of infection prevention and control programmes at the National and acute health care facility level, 2018. Available: <http://apps.who.int/iris/bitstream/handle/10665/251730/9789241549929-eng.pdf?sequence=12> [Accessed 11 Jan 2019].
- Moralejo D, El Dib R, Prata RA, *et al.* Improving adherence to standard precautions for the control of health care-associated infections. *Cochrane Database Syst Rev* 2018;2.
- Hegarty J, Savage E, Cornally N, *et al.* A systematic literature review to support a framework for the development of standards for clinical practice guidance. Dublin: Department of Health, 2015. <http://health.gov.ie/patient-safety/ncac/clinical-practice-guidance/>
- Powers D, Armellino D, Dolansky M, *et al.* Factors influencing nurse compliance with standard precautions. *Am J Infect Control* 2016;44:4–7.
- Birgand G, Johansson A, Szilagyi E, *et al.* Overcoming the obstacles of implementing infection prevention and control guidelines. *Clin Microbiol Infect* 2015;21:1067–71.
- Knobloch MJ, Thomas KV, Patterson E, *et al.* Implementation in the midst of complexity: using ethnography to study health care-associated infection prevention and control. *Am J Infect Control* 2017;45:1058–63.
- May C, Finch T, Implementing FT. Implementing, embedding, and integrating practices: an outline of normalization process theory. *Sociology* 2009;43:535–54.
- Gould DJ, Hale R, Waters E, *et al.* Promoting health workers' ownership of infection prevention and control: using normalization process theory as an interpretive framework. *J Hosp Infect* 2016;94:373–80.
- May CR, Mair F, Finch T, *et al.* Development of a theory of implementation and integration: normalization process theory. *Implement Sci* 2009;4.
- May CR, Cummings A, Girling M, *et al.* Using normalization process theory in feasibility studies and process evaluations of complex healthcare interventions: a systematic review. *Implement Sci* 2018;13.
- McEvoy R, Ballini L, Maltoni S, *et al.* A qualitative systematic review of studies using the normalization process theory to research implementation processes. *Implement Sci* 2014;9.
- Sax H, Clack L, Touveneau S, *et al.* Implementation of infection control best practice in intensive care units throughout Europe: a mixed-method evaluation study. *Implement Sci* 2013;8.
- Liu F, Maitlis S. Nonparticipant Observation. In: Mills AJ, Durepos G, Wiebe E, *et al.*, eds. *Encyclopedia of case study research*. Thousand Oaks, CA: SAGE, 2009: 609–11.
- Sax H, Allegranzi B, Uçkay I, *et al.* 'My five moments for hand hygiene': a user-centred design approach to understand, train, monitor and report hand hygiene. *J Hosp Infect* 2007;67:9–21.
- McCambridge J, Witton J, Elbourne DR. Systematic review of the Hawthorne effect: new concepts are needed to study research participation effects. *J Clin Epidemiol* 2014;67:267–77.
- Jackson C, Lowton K, Griffiths P. Infection prevention as "a show": a qualitative study of nurses' infection prevention behaviours. *Int J Nurs Stud* 2014;51:400–8.
- Gould DJ, Navaie D, Purssell E, *et al.* Changing the paradigm: messages for hand hygiene education and audit from cluster analysis. *J Hosp Infect* 2018;98:345–51.
- Gabbay J, le May A. Evidence based guidelines or collectively constructed "mindlines?" Ethnographic study of knowledge management in primary care. *BMJ* 2004;329.
- Jeanes A, Coen PG, Drey NS, *et al.* The development of hand hygiene compliance imperatives in an emergency department. *Am J Infect Control* 2018;46:441–7.
- Rogers EM. *Diffusion of innovations*. 5rd ed. New York: The Free Press, 2003.
- Greenhalgh T, Robert G, Macfarlane F, *et al.* Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q* 2004;82:581–629.
- Morrow E, Griffiths P, Rao GG, *et al.* "Somebody else's problem?" Staff perceptions of the sources and control of methicillin-resistant *Staphylococcus aureus*. *Am J Infect Control* 2011;39:284–91.