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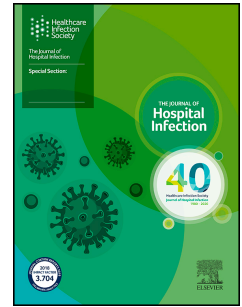
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Barriers and facilitators to infection prevention and control in a neonatal unit in Zimbabwe – a theory-driven qualitative study to inform design of a behaviour change intervention.

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Background: Hospital-acquired infection (HAI) is an increasing cause of neonatal morbidity/mortality in low-income settings. Hospital staff behaviours (e.g. hand hygiene) are key contributors to HAI. Understanding the drivers of these can inform interventions to improve infection prevention and control (IPC).

Aim: To explore barriers/facilitators to IPC in a neonatal unit in Harare, Zimbabwe.

Methods: Interviews were conducted with fifteen staff members of neonatal and maternity units alongside ethnographic observations. The interview guide and data analysis were informed by the COM-B (Capability, Opportunity, Motivation-Behaviour) model and explored individual, socio-cultural, and organisational barriers/facilitators to IPC. Potential interventions were identified using the Behaviour-Change Wheel.

Findings: Enablers within Capability included awareness of IPC, and within Motivation beliefs that IPC was crucial to one's role, and concerns about consequences of poor IPC. Staff were optimistic that IPC could improve, contingent upon resource availability (Opportunity). Barriers included: limited knowledge of guidelines, no formal feedback on performance (Capability), lack of resources (Opportunity), often leading to improvisation and poor habit formation. Further barriers included the unit's hierarchy e.g. low engagement of cleaners and mothers in IPC, and staff witnessing implementation of poor practices by other team members (Opportunity). Potential interventions could include role-modelling, engaging mothers and staff across cadres, audit and feedback and flexible protocols (adaptable to water/handrub availability).

Conclusions: Most barriers to IPC fell within Opportunity, whilst most enablers fell under Capability and Motivation. Theory-based investigation provides basis for systematically identifying and developing interventions to address barriers and enablers to IPC in low-income settings.

The World Health Organisation (WHO) estimates that 25% of 2.8 million annual neonatal deaths are attributable to infection and many more babies have ongoing morbidity [1]. Furthermore, neonates are increasingly exposed to resistant healthcare-associated infections (HAIs), such as *Klebsiella pneumoniae*. As more births in African settings are facility-based, it is arguable that any infection associated with a delivery in hospital should be considered an HAI [2]. In low-income settings, overcrowding, understaffing, restricted infrastructural and microbiological support renders diagnosing and preventing spread of infections with infection prevention and control (IPC) interventions challenging [3]

The evidence base for IPC interventions in Southern African settings is scanty, although increasing [4]. Several outbreaks have been associated with breaches in IPC policy, and understanding of IPC principles may be limited [5, 6]. IPC incorporates a set of complex behaviours, such as hand washing, waste management, and isolation. Therefore improving IPC and limiting HAIs will likely require behaviour change. Multimodal IPC interventions including a strong behavioural change component have been effective and are considered best practice in high-income settings [7-9]. Although there is limited evidence on interventions in LMIC context, tailoring interventions contextually is crucial to ensure acceptability and sustainability. Guidance for developing complex behaviour change interventions advocates commencing with a theory-based understanding of what factors are influencing the behaviour of interest (i.e. conducting a 'behavioural diagnosis' of barriers and enablers), in order to design targeted interventions [10, 11].

One theory increasingly applied to explore influences on healthcare professional behaviours is the COM-B model [12], which stipulates that for any *behaviour* to take place there has to be *capability* (*psychological and physical*), *motivation* (*reflective and automatic*), and *opportunity* (*social and physical*). The COM-B model is mapped onto the Behaviour Change Wheel (BCW) framework, which specifies types of behaviour change interventions [12](Appendix A [13]). This enables systematic, transparent movement from behavioural diagnosis to intervention design, facilitating the selection of relevant, more likely effective behaviour change interventions [12]. COM-B has been applied to IPC and antimicrobial stewardship practices to design interventions [14, 15]. To our knowledge, these frameworks have not yet been applied to IPC in neonatal units (NNUs) in Southern African settings.

Context and Aims

The study aimed to be the first step in developing theory-based interventions to improve IPC practices in a low-resource neonatal unit. Harare Central Hospital (HCH) Neonatal unit, Zimbabwe has been used as a case study. Twelve thousand babies a year are born at HCH, and the 100-cot neonatal unit usually runs at 100-140% capacity. Forty percent of admitted babies have presumed sepsis [16], and a 2017 *Klebsiella pneumoniae* outbreak had a 33% case-fatality (Chimhini et al; in preparation).

Through applying the COM-B model and BCW framework, we aimed to:

1. systematically explore barriers and facilitators to IPC behaviours among healthcare staff in NNU/Maternity as a basis for identifying priority areas for intervention;
2. identify potential theory-based interventions to address barriers and enablers.

Design

A mixed-methods qualitative study, combining individual semi-structured interviews with first-person immersive non-participant ethnographic observations. Interviews rely on self-report and reflection, which may not fully capture what happens in practice or the environmental (physical and social) factors. Therefore, combining interviews with observations allows for triangulation and can bring stronger evidence to inform intervention design [17, 18]. Data were collected between 2018 and 2019. The interviews took place in September 2018, and ethnographic observation from February-March 2019.

Interviews – Recruitment

Recruitment involved: convenience sampling among junior staff in the unit (announcing the study among nurses, midwives and cleaners during morning handovers on consecutive days), and purposive sampling among senior staff members (approaching senior clinicians directly). Interested participants volunteered their names, and from that list interviewees were drawn at random by the interviewer.

Fifteen participants working across four departments of neonatal/maternal care were interviewed in September 2018 (n=4 physicians, n=4 general nurses, n=6 nurse midwives, n=1 cleaner). Fifty percent were in leadership positions (Appendix B).

Interviews - topic guide and data collection

To protect participants' identities, no demographic characteristics were collected except for information on their role and years working in that role and in the hospital. Interviews were semi-structured, including questions to explore potential barriers and enablers to IPC related to each of the COM-B domains (Appendix C). Target behaviours of interest included hand-washing, cleaning (e.g. of the unit and equipment), and performing clean procedures (e.g. intravenous cannulation). The interview also allowed for open-ended, follow-on prompts to expand upon participant responses. The interviews were conducted in private during working hours by a Zimbabwean social scientist in English and the local language -Shona. The interviews were audio-recorded, transcribed verbatim, anonymised and translated into English, where required.

Ethnographic observations – data collection

An ethnographic researcher conducted observations in neonatal and maternity units. The observations took place over six weeks, involved non-participatory site visits and staff shadowing during eight days (morning and daytime shifts), and one night shift. The observations were written up in a form of a daily log that was analysed subsequently.

First phase of data analysis – identifying barriers and facilitators

Interview data analysis

First, the interview transcripts were analysed deductively (top-down) by coding participant responses according to COM-B domains. For instance, *“I am worried about myself, members of the staff, my colleagues, the relatives, my family as, because I can take infection here and go home with it”* was coded under 'Reflective Motivation'. Secondly, similar responses across participants coded to the

same COM-B domain were grouped, and theme labels inductively generated (bottom up). The theme labels summarised the role that each domain played in facilitating or hindering IPC practices in this context.

Ethnographic data analysis

The ethnographic daily logs were analysed inductively and continually clustering emerging themes during the period of field research. Additional data from observation was tested according to these emerging themes. Secondly, to allow data synthesis from two data sources, these themes were then mapped onto the COM-B framework and integrated with themes from the interview analysis (See Appendix D for the themes and COM-B mapping). New themes emerging from the observations were added to the COM-B codebook.

Second phase of data analysis - Identifying potential intervention functions and components

Identified barriers and facilitators to IPC were linked with potential intervention components using the BCW framework [12]. This involved consulting matrices that map domains from the COM-B model to broad types of interventions specified in the BCW (e.g. education, training, persuasion), plus more granular behaviour change techniques (e.g. goal-setting, action planning, social comparison, feedback) [12, 13]. Potentially relevant intervention strategies were then considered by the wider team against the APEASE criteria (Affordability, practicability, effectiveness and cost-effectiveness, acceptability, side-effects/safety and equity) [12, 19].

Ethical considerations

The study was approved by Harare Central Hospital Ethics Committee (HCHC 070618/58), the Biomedical Research and Training Institute in Harare (AP148/2018), Medical Research Council of Zimbabwe (MRCZ/A/2354), and UCL Research Ethics Committee (5019/004). Interview participants provided informed consent before the interviews commenced and were provided with refreshments but no financial incentives. Informed consent was obtained prior to shadowing.

Results

Phase I: behavioural analysis

The interviews identified barriers and facilitators to IPC across all COM-B domains (Table I). Appendix E reports all themes from both data sources with frequencies and illustrative quotes. Overall, themes from the ethnographic observations tended to corroborate or elaborate on the interview themes, particularly for the domains of Social and Physical Opportunity. Additionally, they brought new findings (e.g. insights about the staff cuddling and comforting babies without appropriate hygiene). The results for each COM-B domain are summarised below.

Capability – psychological and physical

Staff were aware of the unit's IPC underperformance, but had limited knowledge of actual HAI rates and did not receive any formal feedback on their IPC-related performance. Interviewees tended to be knowledgeable about many aspects of IPC and the relevant practices involved, but some believed that other staff lacked the knowledge necessary to perform IPC tasks - "[staff] tend to say 'I do hand washing' but when you ask them to demonstrate they will not be knowing how to do it" (MN15). Indeed, although some of the interviewees received training on IPC in the past, there was limited training offered at the unit: an important barrier given the high rotation of staff. However, not all

staff believed that training would be sufficient – the challenges come on implementation because the resources were never availed for training we just train people but resources are not there” (MN8).

Some staff admitted forgetting about IPC, especially when working under pressure (e.g. attending to emergency). Furthermore, some staff tended to rely on explicit information about infectious cases or visual cues (e.g. rash) as basis for deciding to engage in best practice IPC, sometimes with limited or incorrect understanding of mechanisms of transmission e.g. believing that syphilis is transmitted via contact rather than sexually: *“there will not be need to use gloves all the time as long as my hands are clean, but there are some who are infected e.g. who are syphilis positive I will need to use gloves so that I do not get infected.”* (MN4)

Local or international guidelines on IPC were known to senior staff. However, some felt that the existing protocols were inadequate when key sanitary resources were unavailable (e.g. water), and expressed a need for new flexible protocols- ‘next best’ guidelines. Finally, when faced with resource shortages, staff improvised (e.g. *“Sometimes there are no catheters and even the urine bag. So you end up connecting a urinary catheter and at the end of the catheter you put a glove to improvise”* (PH14) or using paper that had previously been written on to clean their hands), but some gave up altogether.

Motivation – reflective

Interviewees tended to have high motivation to perform IPC-related behaviours and reported prioritising IPC-related tasks whenever possible. Staff often had well-defined roles regarding IPC, and viewed all staff as well as adult patients and babies’ families as being responsible for IPC outcomes. The senior staff played an important role through monitoring, teaching and correcting IPC-related practices, while cleaning duties were the responsibility of the cleaning or junior nursing staff. Nevertheless, one junior doctor reported viewing their role in IPC very narrowly: *“All I do personally is discarding sharps in a sharps tin, that’s as far as I go”* (PH6).

Secondly, many interviewees tended to be confident in performing different IPC practices that were part of their role, or on which they have received some training (e.g. isolating patients due to a recent cholera outbreak). Staff were also aware of the importance of IPC for morbidity and mortality within and beyond the hospital. Many interviewees had intentions or goals that were congruent with adhering to IPC practices and improving patient outcomes, as well as protecting their own health or the health of their families. Finally, most staff were optimistic about IPC improving in the unit, but this was contingent on resource availability.

Motivation – automatic

There was limited use of reinforcement for performing IPC-related tasks, including incentives. There were also no sanctions for poor performance, although staff could be verbally criticised. Emotions tended to be important enablers of IPC, e.g. upholding IPC standards was intrinsically rewarding to some staff. Many staff were worried about the serious consequences of poor IPC, including for their own families: *“... so I do worry whether or not I have given a baby sepsis and I do worry whether I am taking infection back to my child at home.”* (PH16) Furthermore, ethnographic observation indicates that disgust towards certain bodily fluids (e.g. mother’s vomit, as well as babies’ faeces and blood) was more likely to motivate IPC behaviour.

Opportunity – physical

All interviewees discussed at length the lack of resources required for upholding IPC standards (e.g. gloves, water, soap, sanitisers, protective clothing). Moreover, IPC was at risk due to shortages of other key resources on the unit (e.g. Oxygen nasal prongs, thermometers), which often led staff to sterilize and re-use single-use equipment or share equipment with other hospital units. One clinician admitted developing negative habits due to the lack of resources: *“When there is no water and there is no alcohol, you are stuck [...] and then it becomes a bad habit and then that habit becomes a lifestyle”* (PH16). This was reflected in the observations: even on days where both were available, the nurses, mothers and doctors sometimes refrained from washing their hands or using disinfectant for no apparent reason.

Furthermore, over-crowding in the unit prevented isolation, high visitor traffic without control access (not only mothers who attend 6-8 times per day for feeding, but for example full surgical teams with medical students for training) potentially promoted infection transmission, and staff shortages, especially the cleaning staff, made it challenging to keep up with IPC activities. Although ethnographic observations showed that the unit was designed with IPC in mind, many resources had aged, reached their capacity or could not be kept sterile at busy times (e.g. the sluice room at the centre of the unit). Broken toilets or clean facilities for carers (mothers) also resulted in these adults transferring across the hospital wards several times per day, risking cross-contamination.

The observations identified further areas hindering IPC, including staff and mothers interacting with many objects during daily routines without sufficient hand hygiene (e.g. stethoscopes, mobile phones, benches on which mothers sit during feeding times). Finally, and possibly due to no alternatives, staff were seen during the ethnographic observations to use baby cots as temporary desks to write notes on or as placeholders for items (e.g. staplers). The fact that these themes have not emerged during the interviews may suggest that staff were not aware of the importance of these practices and objects in terms of IPC.

Opportunity – social

Social influence was a very important factor for IPC in the unit. Staff’s practices around IPC were influenced by their colleagues, e.g. through reminders and encouragement, as well as explicit instructions. At the same time, interviewees reported noticing other staff members not performing IPC tasks. Similarly, a common ethnographic finding was that clothing, personal items and accessories of both lay and reviewing teams at the unit often fell short of IPC recommendations (e.g. long sleeves, ties, wristwatches, omnipresence of personal bags).

The unit was very hierarchical, which was especially clear from the observations (with clinicians at the top and neonates’ mothers at the bottom), and which impacted both on IPC, and communication between staff in the unit. Discussions about IPC tended to happen among peers, but there seemed to be important barriers for the junior cadres to voice concerns or suggestions. *“I think that communication is key amongst ourselves, as a cleaner I should be able to talk to a doctor for example if he drops a needle it will be very difficult to tell him that.”* (CL13). The cleaning staff were also not involved in the discussions on IPC *“I think that they should invite us once or even once a month to a meeting of cleaners like what the Doctors do every Wednesday”* (CL13). At the same time, low awareness and disengagement of managerial staff was also mentioned: *‘The assumption from the administrators is that everything is okay down here, yet we who are on the ground are saying no, all*

Furthermore, there was a lack of regular and formalised unit-wide meetings to address IPC practices and outcomes. Additionally, there was also no system to inform all staff, including the cleaners, about known cases of infections among specific patients or best IPC practices: “no one explains to you [...] or even to tell you that this mess [needing cleaning] is from a deadly infection or that the ward you are about to enter has a baby suffering from this type of infection” (CL13).

Staff tended to approach only adults (and their bodily fluids) and patients with clearly visible signs of infections (e.g. skin rash) with greater consideration of IPC standards (e.g. using gloves). In contrast, neonates who were asymptomatic were treated as *uninfectious* as opposed to *infectious*. As a result, neonates were often cuddled with little to no barrier nursing, and no gloves were used when cleaning baby vomit or changing diapers. Finally, although some staff mentioned educating patient carers (i.e. mothers) on elements of IPC, the latter group played a minimal role in IPC.

Phase 2 – identifying potential intervention components

Table I presents potential intervention types to address identified barriers and enablers in this context, according to the BCW [12]. Appendix F and G provide details of intermediary steps, selecting relevant intervention types and component behaviour change techniques. Special considerations were given to intervention components that could have unintended negative consequences as per APEASE criteria and cultural norms, such as high cost, low sustainability or stigmatisation (e.g. marking infectious neonates might impact on the care provided by their relatives).

Discussion

This theory-informed mixed-methods study identified that Capability, Opportunity and Motivation were influences on the performance of IPC behaviours among staff in a Zimbabwean neonatal unit. Barriers in the domains of psychological capability (e.g. knowledge and behaviour regulation), social and physical opportunity emerged as key factors to performing IPC-related behaviours. However, staff already demonstrated high motivation and commitment to adhere to IPC practices, which manifested in improvisation when faced with severely constrained resources. The study has identified enablers and targets that could be the focus of future interventions even in the absence of resources considered vital to IPC in high-income settings, in particular involving and empowering junior staff and parents.

Our findings align with previous research. Poor compliance with IPC practices has been observed both in high and low-income settings and across health settings [20-24]. Limited resources are a common contributor to poor IPC practices [22, 25-27]. Our study also showed how economic upheavals exacerbated pre-existing constraints affecting the Zimbabwean health system [26]. These included supply limitations, including water and alcohol hand sanitisers, as well as aging and overstretched facilities, understaffing, and heavy workload. These shortages negatively impacted on motivation and self-efficacy to perform IPC, as found in HICs [25].

Other barriers found here and elsewhere included lack of guidelines [28], insufficient knowledge or skills [20, 21, 27, 29], low prioritisation of IPC tasks and competing demands [21, 29]. The importance of considering IPC as a habitual behaviour cannot be overstated [21, 30].

We found that staff were motivated to perform IPC practices, including for self-protection and avoidance of contact with bodily fluids, which is an important IPC facilitator [21, 27, 31]. However, motivation to perform IPC practices is not ubiquitous [24, 25, 27]. This could demonstrate real differences in motivation between settings, or potentially our study over-sampling more motivated staff members.

Implications for Interventions

Interventions showing promise to improve IPC practices tend to include multiple components [20, 31, 32]. We identified several theory-informed components meeting the APEASE criteria [13, 19], some in line with existing recommendations and similar studies [9, 27]. Staff's capability could be improved through IPC protocols that stipulate what is best practice in the absence of running water or soap (i.e. 'next-best' practice)[9], setting attainable targets rather than promoting despondency and abandonment of IPC. Prompts could help trigger IPC behaviours among staff [21] but the present findings emphasise the need for non-stigmatising cues. Furthermore, capability could be improved via regular monitoring and feedback[32].

Although guidelines and educational initiatives have so far not been consistently associated with good IPC practices [9, 20, 31, 33], targeted materials and training can help ensure understanding among staff and visitors [29]. Our findings suggest that education should cover the importance of hygiene practices around asymptomatic neonates who may nevertheless be infectious: poor hand washing among staff can contribute to transmitting *Klebsiella pneumoniae* from neonates' faeces and vomitus [34]. The training resources should promote problem solving and action planning in the context of competing demands and resource constraint [35] and include persuasive components (e.g. feedback from credible sources, rewards, verbal persuasion about capabilities) to increase motivation and self-efficacy [31].

Considering minimal time and resources, training could be delivered through on-site mentoring and demonstrations, as well as videos or mobile-based training. In November 2018 the NNU in HCH has already implemented a digital quality improvement and data collection platform which incorporates decision support (NeoTree), replacing paper admission/discharge/death documentation [36]. NeoTree could be utilised as a platform to deliver IPC training as well as monitoring and feedback of staff performance.

Finally, the study highlights the untapped potential of human capital in the unit. IPC is a complex set of team-level behaviours requiring mutual coordination and understanding across levels, and which is highly responsive to social influences [21, 25, 31]. Firstly, the senior team members should play a greater part as role models [21, 25]. Secondly, given hierarchical structures in the unit it is crucial to create a supportive environment promoting communication and empowering disenfranchised staff members. Cleaners are an important yet often poorly integrated role, as found in maternity units in Bangladesh, India, Gambia and Zanzibar [37]. Introducing dedicated training sessions to the primary carers of the neonates (i.e. mothers) and educational materials to family visitors (e.g. videos/posters directed at the fathers) could improve IPC outcomes, as shown recently in India [38].

Strengths and limitations

The strengths of the study include the use of a systematic, evidence-based theoretical framework

(the COM-B model and the Behaviour Change wheel) to explore barriers and enablers of the related behaviours, and to identify relevant interventions. The use of triangulation through integration of interview data and ethnographic observations enabled a nuanced description of factors influencing IPC.

However, the study was conducted among a relatively small sample of participants, with some roles being represented by a single interviewee (e.g. a cleaner). There was also an overrepresentation of staff in leadership positions and those likely to have high capability and motivation to engage in IPC practices. It is possible that these two domains of influences would still need to be researched and addressed in future interventions, especially among more junior and cleaning staff. We did not include interviews with parents, who play a crucial role in caring for their infants. Any sustainable IPC intervention will likely need to incorporate family members.

Implications for future research

This study was designed as a first step in the best-practice development of interventions to limit HAIs. Future research should address how to engage patient families and junior cadres in IPC practices, and to systematically assess the feasibility and effectiveness of the different intervention components identified in this study.

Conclusions

Using a structured, theory-based approach to describe barriers and facilitators to IPC has allowed us to inductively plan contextually appropriate behaviour change interventions. Although the challenge of IPC in NNUs in low income settings such as Harare Central Hospital can appear insurmountable and overwhelming, we found cause for optimism in this systematic approach. Staff were motivated to improve, and understood the importance of IPC for their patients and for protecting themselves and their families. Using the methodology offered by the Behaviour Change wheel we have unpicked areas that may be feasible and affordable to intervene such as positive feedback, role modelling, establishing 'next best' protocols for IPC in the absence of sanitisers and water, offering training to all new staff and visitors, and engaging patients' carers and relatives in IPC tasks.

Contributors

FF, FL, GC, SC conceptualised the study. SM, SW, NK advised on the grant and study protocol. FF and FL obtained the funding and lead on securing ethical approvals. GC oversaw data collection and local IRB approvals. KS and FR conducted data collection. AH and JRP conducted data analysis. AH, FR, JRP, FF, FL, GC, and SC interpreted the data. AH, JRP, and FF prepared the preliminary draft. All authors contributed to the final manuscript.

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Conflict of interest

AH, JRP, KS, FR, SM, SW, NK, FL, FF declare no conflict of interest. GC and SC are senior consultants in Harare Central Hospital neonatal unit.

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Table I: Summary of barriers to IPC practices across COM-B domains, together with recommended intervention functions (IFs) and example behaviour change techniques

Barriers in each COM-B domain	IFs	Example behaviour change techniques	Example intervention components judged to meet the APEASE criteria in the current context
Capability - psychological and physical			
Limited knowledge of some aspects of IPC and IPC guidelines; inadequate IPC protocols in the unit	E1, E2, ER, T, M	Adding objects to the environment;	Provide copies of guidelines on IPC; develop flexible IPC protocols that account for the limited IPC resources (e.g. 'next-best' practice if water/hand rub not available)
Competing demands may lead to forgetting about IPC and prioritising other behaviours or tasks; some staff perform IPC practices only for patients with known or visible signs of infection		Action planning; Adding objects to the environment; prompts and cues; problem solving.	Offer training to staff that emphasises that lack of visual cues does not rule out infections; Introduce discrete, non-stigmatising prompts informing all staff about infectious neonates and contaminated objects.
No training adapted for the unit and for new staff; limited knowledge of IPC among some staff		Instructions on how to perform the behaviour; Demonstration of the behaviour; Persuasion about capability.	Mandatory training on IPC, including instructional videos for all new and visiting medical staff; training sessions with UV gel and UV light to reinforce high level hand-washing techniques; training tailored to the limited/intermittently available resources in the unit.
Motivation – reflective and automatic			
Confidence in performing IPC tasks tends to be contingent on availability of appropriate resources	E1, E2, P, M	Social support (unspecified), social support (practical), problem solving, action planning,	Offer training and protocols on how to improve IPC practices even in the absence of resources that are normally required for IPC (e.g. water).
Insufficient rewards and no sanctions for poor performance on IPC practices		Rewards, Incentives	Train staff on how to provide social rewards or introduce other system of sustainable incentives to promote good IPC practices (e.g. leader boards, IPC champion of the month, opportunities for training)
Opportunity – physical and social			
Shortage of supplies and staff; heavy workload and overcrowding;	E2, ER, M, R	Restructuring the environment ;problem solving, action planning, goal setting (behaviour), goal setting (outcome),	Employ additional cleaning staff; allocate tasks related to IPC among other staff; introduce sections in each room only for infectious patients and contaminated objects
Lack of formal and unit-wide discussions of IPC or feedback; and insufficient communication about best IPC practices and infection cases in the unit.		Action planning, goal setting and review, adding objects to the environment, self-monitoring, feedback on behaviour and outcomes of the behaviour,	Establishing regular meetings to discuss IPC at the unit and to provide feedback to different staff members about their performance and its impact on infection levels; Establish ways to inform all staff members about known cases of infection in the unit.
High traffic of visitors into the unit; poor adherence to IPC practices among clinical and		Adding Objects to the environment, Instructions on how to perform the	Introduce strict limits on who can enter the unit; expect all visits to adherence to strict IPC protocols (e.g. do not allow street clothes);

family visitors, including wearing inappropriate cloths and bringing street items (e.g. phones and bags)	behaviour,	offer space to leave bags or personal items; use prompts and cues to remind staff and visitors about their responsibilities towards IPC
Hierarchical relationships hinder communications between different staff groups and adult patients; patients' mothers (and other relatives) play a very limited role in IPC.	Social support (unspecified), social support (practical), action planning,	Empower junior staff and patients' family to voice concerns and remind staff about IPC practices (e.g. hand washing); prepare materials on IPC (e.g. posters, training videos) targeting different family members of the patients (e.g. mothers, fathers).

E1= Education, E2=Enablement; ER=Environmental Restructuring; M=Modelling, P=Persuasion; R=Restriction, T=Training

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