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Major Article

Supporting patients and their carers to participate in infection prevention and control activities: The views of patients, family members, and hospital staff from Bangladesh, Indonesia, and South Korea

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Background: Hand hygiene reminders for healthcare workers (HCWs) are commonly used to empower patients. However, this approach overlooks the role of family carers in delivering direct contact care in Asian countries. Limited knowledge exists regarding empowerment strategies for patients and their family carers in infection prevention and control (IPC) recommendations. This study aimed to provide a comprehensive exploration of IPC empowerment within the context of family involvement in care provision across Bangladesh, Indonesia, and South Korea.

Methods: In-depth interviews were conducted in 5 tertiary-level hospitals in Bangladesh, Indonesia, and South Korea. A total of 64 participants were interviewed through 57 interviews, including 6 group interviews, comprising 2 groups: (1) patients and their family and private carers; and (2) HCWs.

Results: The study identified barriers to engaging patients and family carers in IPC measures. These included concerns about the patient-HCW hierarchical relationship, lack of knowledge about healthcare-associated infection, IPC, and patient zone, perceptions of IPC as a barrier to family connections, and disempowerment of patients in IPC due to family bonds.

Conclusions: This study provides diverse perspectives on IPC empowerment, revealing challenges faced by patients, family carers, and HCWs. The interlaced relationship established by social norms of family carer provision hinders the empowerment of family carers. Acknowledging the cultural influence on health care arrangements and its implication for IPC empowerment is crucial in mitigating these barriers.

BACKGROUND

The World Health Organization defines empowerment as the process of people gaining more control over decisions and actions related to their health.[1] Previous efforts have focused on empowering patients to encourage healthcare workers (HCWs) to comply with hand hygiene practices.[2–7] These efforts primarily involved patients and their family members nudging or reminding HCWs to practice hand hygiene before touching the patient. However, there are 2 issues with this approach in certain settings.[2,8–18] Firstly, in some cultural settings, it is unlikely that patients or their family members would critically address HCWs about their hand hygiene behaviors,[19] and secondly, HCWs may not wish to receive these reminders. For example, a study in Vietnam found that

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across most of the categories of HCWs surveyed, less than half believed that patients should remind them to perform hand hygiene.[20] Similarly, a survey in a Korean hospital reported even fewer HCWs (range: 26%-31%) supported patient participation in hand hygiene due to concerns about the HCW-patient relationship. Patients and family carers also expressed difficulty in reminding HCWs to practice hand hygiene, and the majority disagreed that it was their role to do so.[18]

Focusing solely on HCWs hand hygiene is limited when considering the entire patient care pathway and the various care activities conducted by other individuals in the clinical setting. In many Asian countries and low- to middle-income settings, patient family members, friends, and hired private carers may engage in a range of invasive and direct contact activities, often involving exposure to body fluids in the patient area.[21] In such settings, a broader approach is needed to empower patients and their family members, making them aware of their own hand hygiene practices, the environment, and their involvement in care activities. This approach can significantly contribute to reducing infections in acute care settings. The challenge is that we have a limited understanding regarding the involvement of patients and their family members in infection prevention and control (IPC) practices in low-, middle-, and high-income settings and whether any strategies are being used to empower them. This study aimed to provide a comprehensive exploration of empowerment within the context of family carers' involvement in patient care activities, irrespective of resource settings in Asia, namely Bangladesh, Indonesia, and South Korea.

METHODS

A complete outline of the methods employed in the study has been described in the previous publication.[21] In summary, this study used a qualitative methodology using in-depth, semi-structured interviews. We interviewed 3 groups of participants: (1) patients who were hospitalized for a minimum of 2 days and who had a family or private carers present with them; (2) family and private carers who had provided care for at least 5 hours at the clinical setting; and (3) HCWs who had worked at least 1 month at the hospital. All participants included in the study were 18 years of age or older. Data were collected from 5 tertiary-level hospitals across 3 selected countries in Asia: Dhaka in Bangladesh, West Java province in Indonesia, and Gyeonggi-do province in South Korea. All interviews were conducted between July 2019 and February 2020. All the interviews were conducted in the participant's native language by the local research team. 64 participants were interviewed in 57 interviews, including 6 group interviews. The group interviews were not planned, but due to time pressure, feasibility, and patient's preferences, group interviews with patients and their family carers were simultaneously done in some settings. Unlike the focus group, the interviewer interacted with each individual.[22] Interviews ranged from 17 to 55 minutes each and took place in various locations, such as a patient's bedside, an empty patient room, an empty staff room, a café in a lobby, and a vacant manager's room. Interviews were audio-recorded with the participants' agreements for analysis. The audio-recorded interviews conducted in Bengali and Bahasa Indonesia were professionally translated into English. The first author, fluent in Korean and English, translated the Korean transcripts. For those Korean translations, the back-translation by a qualified independent person was done to confirm the accuracy of the translation.

Using NVivo12, the initial stages of analysis and data management were performed. Drawing upon the principles of grounded theory, we conducted the reflexive thematic analysis with an inductive approach for data analysis.[23–29] During the data collection phase, we embraced the principles of grounded theory, which involve the simultaneous collection of data and iterative analysis. Data were analyzed following the 6 phases of reflexive thematic analysis as outlined by Braun and Clarke.[24,26,28] These phases encompassed the following steps: (1) familiarizing yourself with the data, (2) generating initial codes, (3) constructing prototype themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report.

We commenced the data analysis after the first interview, which allowed us to revisit the research questions and interview guides, making revisions to unexplored prompts or areas. This iterative process enhanced the depth of the collected data and informed the subsequent interviews. As described by Clarke and Braun,[30] we revisited previous phases throughout the analysis process to identify raw data relevant to the candidate themes.

The interviews were repeatedly listened to and read multiple times to become familiar with the data. The first author, JYP, developed a list of initial codes; then, in consultation with HS and JFP, final codes and themes were developed. As we developed the initial codes, we analyzed based on the participant groups. After the initial codes were established, we proceeded to search for patterns or connections specifically between groups and across countries. This approach allowed us to identify commonalities or distinctions among participants from different countries or within specific groups, contributing to a deeper understanding of the data.

During data analysis, there has been consistent engagement with the local research team to clarify findings and with other researchers to discuss and refine the codes and themes generated.

Ethical clearance for this study was received from the University of New South Wales Human Research Ethics Committee (Approval No. HC 180919), International Center for Diarrheal Disease Research, Bangladesh (Approval No. PR-19012), Bandung Islamic University Health Research Ethics Committee (Approval No. D.10.0533), and Catholic Medical College Institutional Review Board (VC19QEG0051).

RESULTS

The demographic characteristics of interview participants in this study have been previously published.[21] In summary, 64 participants were interviewed across 3 selected countries: 20 interviews from Bangladesh, 19 interviews from Indonesia, and 25 interviews from Korea were conducted. Of the 64 interviewees, 16 were patients, 21 were family carers, including 1 private carer, and 27 were healthcare workers. Quotes have been used from all 3 country settings: Korea: KR; Bangladesh: BD, and Indonesia: INA. The interview findings are presented based on the themes and subthemes identified from the data: 3 main themes and 6 subthemes (Table 1).

Difficult to talk to

Don't want to be labeled as a picky person

Many of the patients and their family carers described themselves as being disempowered as they had limited levels of understanding about the risk of infection in the hospital and the strategies that can be used to reduce their risk. They felt that this put them in a vulnerable position and could not confront HCWs' noncompliance with hand hygiene. Patients from Korea mentioned that *they (patients) are not professionals with expert knowledge* when asked if they

Table 1
Themes and subthemes from the findings

Theme	Subthemes
Difficult to talk to	• Don't want to be labeled as a picky person • Don't want to hurt feelings
Knowledge matters	• Misunderstanding of patient zone • Limited knowledge and perceptions of risk
There is no role for a patient	• As a part of the family carer's duty • Education but no empowerment

had ever asked HCWs to wash their hands: *I do not feel I need to ask HCWs separately because they are professionals with expert knowledge (KR, Patient, 006).*

Hesitation to speak to HCWs about their infection concerns was expressed by some patients and family carers from Bangladesh and South Korea. This hesitation often stemmed from fears of potential negative consequences or repercussions. One family carer responsible for the care of her mother-in-law who was concerned about getting an infection from a dirty curtain described their perspective: *"what if they (HCWs) hate me…. I fear that they (HCWs) hate me. From the patient's position, we are afraid to be labeled as a picky patient. What if they (HCWs) call me a rude patient when I say something about it?" (KR, Family carer, 010).*

Another participant from Bangladesh echoed a similar sentiment discussing concerns during her hospital stay: *"they (patients and family carers) cannot tell anybody, nor can they do anything. If they ask for anything or say anything to the hospital staff, then the staff misbehave with the patients. Therefore, they (patients and family carers) keep silent." (BD, Patient, 001).*

Furthermore, a family carer from Korea, responsible for daughter's care, expressed hesitation in questioning medical authority due to the hierarchical relationship between doctors and patients: *I think they (doctors) will scold me for asking a useless question…. I did not mean they (doctors) would really scold me like that (KR, Family carer, 007).* It is important to note that while this statement may initially appear contradictory, it reflects the family carer's internal conflict. On the one hand, there is a fear or potential negative reactions from HCWs due to questioning or speaking up. On the other hand, the carers recognizes that the scolding may not actually occur in reality, indicating a desire for respectful and open communication. This inconsistency highlights the complex emotions and concerns experienced by participants when it comes to engaging with HCWs. The participant also highlighted the lack of support or opportunities for patients and their carers to ask any questions: "*Although he (doctor) stayed for a reasonably long time here. how could I ask a question, he was talking to the others in the team*". A similar view emerged from interviews conducted in Korea, where patients and their family carers perceived themselves as passive observers rather than actively engaging in the IPC measures.

> *When they (doctors) were doing the rounds, they asked us to ask any questions. But I could not think of any when they were around. And we do not have medical knowledge, and I hesitated to ask any questions…. they wouldn't let me even get a word in edgewise (KR, Family carer,007)*

Don't want to hurt their feelings

During the interviews, HCWs expressed a connection between reliance on family and private carers for support in providing care and their hesitation to reinforce IPC measures or endure compliance with them. One HCW from KR described their perspective when dealing with family carers and private carers caring for a patient isolated in a contact precaution room, stating, *"I did tell them (family or private carer), but actually I can't help those who have stayed here for a long time. Because other than that, they (family and private carer) are doing a good job assisting patients with position changes for bedsores, range of motion exercise, etc. So, it is difficult to reinforce them (family and private carers) about it (adhering to the recommended IPC measures) … I can only advise them again but cannot force them. (KR, Nurse, 002)".*

There was also a sense that some patients were unlikely to reinforce IPC recommendations, such as hand hygiene, due to their dependence on the family member or private carer for their care. A patient from Bangladesh shared his experience of being cared for by his family carers and predicament: *"I am a patient here. How can I say anything as he (family carer) is serving me? Being a patient, I do not play any role here. I will have to take the service the way they (family carers) are giving me. It is not possible for me to instruct them (family carers)". (BD, Patient, 004).* When asked to elaborate further about why patients could not speak up to their family carers, the participant stated, "*Both of us (patient and family carer) might feel irritated about continuous instruction… I have not said anything because he might feel annoyed… he is serving me all day. He might feel irritated if I instruct him" (BD, Patient, 004).* The participant did not explicitly state the consequences of their family carers being irritated, indicating they were uncomfortable talking about the subject. This view was also mirrored in interviews with family carer participants from Bangladesh and Korea, who stated difficulties complying with IPC requirements as complying with IPC measures might hurt the feelings of their sick family members. Even a HCW emphasized that family relationships could be a significant barrier for family carers to comply with required IPC measures, such as masking, as well as empower their patients, especially before their sick family member when asked about their experience of being a carer:

> *Precaution? I could not take proper precautions before my father as I am his daughter… it would be better if I could use a mask. And I always had to stay beside my father (BD, Nurse, 005)*

Another participant from Bangladesh described how difficult IPC empowerment could be between patients and their family members as patients and their family carers considered the IPC measures a barrier to their support and connection as a family and influenced their cohesive relationship.

> *The patient feels bad if his relatives wear a mask while touching or being with him. His close relatives are using masks, making him think that something terrible has happened to him. The patient feels apprehensive, he becomes afraid of thinking about what type of disease this is and what happened to him. (BD, Nurse, 004)*

The concerns about hurting others' feelings were not limited to patients and their family carers. A participant from Indonesia stated that they could not be overt in IPC measures as this could hurt others' feelings despite their knowledge.

> *Well… to keep a safe distance, I guess it is a dilemma when you share rooms with other patients. Avoiding the other patients could not be too obvious as it might hurt their feelings. (INA, Family carer, 002)*

Furthermore, the participant stated that discussing infection status and instructing the required IPC measures to family carers should not be publicly done and not with a patient:

> *We inform the patient's carers (about the infection) but not in front of the patients. I am not reckless. The patient's carer usually accompanies a patient to the consultation. Usually, when the patient is having a consultation with a doctor or other tests, we approach their carers and inform them about the risk of infections like "As the patient has x, we will give you some cautions, etc." (INA, Nurse, 008)*

Knowledge matters

Misunderstanding of patient zone

Lack of understanding around the patient zone and meaning of physical touch (i.e., World Health Organization 5 moments of hand hygiene) were noted in the patient interviews when they were asked if they had observed hand hygiene practices of their care providers, including the hospital staff and their family carers. A patient from

Korea suggested that hand hygiene was not required when a HCW provides care activities that did not involve touching the patient:

> *When they (HCW)came, they were not really touching me. They checked my blood pressure. They occasionally came and used this (alcohol-based handrub), usually nurses did. As long as they are not physically touching (me), they are not washing their hands when they come. Checking my blood pressure.* And *what is it called? Those things, the fluids, they control the setting of intravenous fluids…they asked me about my condition…when they were doing those, they were not touching me. (KR, Patient, 002).*

When we asked the patient to clarify what they meant by 'physical contact', it was noted that the participant's understanding of physical contact was only limited to skin-to-skin contact. Similarly, another patient from Korea stated that hand hygiene was not required for HCW unless invasive treatment was given, indicating a lack of awareness around the patient zone.

> *Most of them (HCWs) washed their hands, I think they did. That thing (alcohol-based handrub) …when they (HCWs) were doing something with the IV fluid, using a syringe, testing urine, they washed…but they (HCWs) did not do it (hand hygiene) when they only checked my blood pressure or something like that. (KR, Patient, 003)*

The misunderstanding around physical contact and the lack of patient zone were also noted in interviews with some family carers from Bangladesh. The family carer claimed that visitors were not required to perform hand hygiene as *they (visitors) had not used anything, touched anything, or eaten anything. (BD, Family Carer, 001).*

Limited knowledge and perceptions of risk

Limited knowledge around healthcare-associated infections (HAI) and IPC measures was another significant barrier expressed by participants across 3 countries when it came to being encouraged to engage in IPC strategies. There was varying knowledge around HAI and IPC measures among all participants, including HCWs, patients, and family carers. Some participants believed that HAI was only an issue for those with another infectious disease. A patient from Korea expressed her concerns about the risks of getting a respiratory infection due to her previous experience in a hospital during the Middle East respiratory syndrome outbreak. However, the patient did not express any concerns about HAI when asked, as they believed the ward was not designated for infectious diseases.

> *Like the Middle East respiratory syndrome outbreak before, I was also worried about respiratory infections. But only gynecology patients are roomed with the same gynecology patients, so it would be okay. (KR, Patient, 005).*

The same view was reflected in a participant's interview from Bangladesh when asked if there were any concerns about HAI whilst staying in the hospital.

> *This is a place for orthopedic issues. If I were in any other department, I could say that someone had an infection or another one had caught a cold or a cough from there or from a pneumonia patient with a baby with them. From him or her, another one got pneumonia. No, nothing like that here in the orthopedic department. Because it is where bone works are done. We are here in the orthopedics section, and there are fewer bacteria. (BD, Patient, 006).*

While some participants proposed implementing IPC measures to mitigate the risks based on their knowledge, others claimed the low-risk perception as another barrier to empowering IPC practices. As mentioned by one nurse from Indonesia: "*I think most of them (patients and their families) did not take it seriously. They probably did not know the risks, or they simply did not know what the diseases would look like. It is based on my opinion, though… It is simply because they are not aware of the risks." (INA, Nurse, 009).* This view was mirrored in the interview with a family carer from Bangladesh. The family carer from Bangladesh considered HAI simply "*It's bad luck that the germs are spreading. Now it seems like all the patients are getting infected. When I first came here, there were only 2 or 3 people. Now everyone is infected." (BD, Family Carer, 003).*

One family carer rejected adherence to IPC measures, citing a belief that such measures primarily affected individuals with compromised immune systems: "*I think that it is not risky for me to stay beside my patient as I have strong immune power. Each person has a strong immune system. Weak persons do not have strong immunity, so they are always physically weak. Then infection affects them quickly. So, we are well for strong immunity, so it is not needed. So, I am not doing." (BD, Family Carer, 006).*

There is no role for a patient

As a part of the family carer's duty

Many family carers stated that family carers and HCWs should play a role in encouraging patients to engage in IPC strategies. A family carer from Bangladesh described their position in IPC empowerment.

> *Because it's our job to make sure that a patient doesn't get infected. The doctors treat the patients, but our responsibility is to advise them on what to do. Those who come from the village often don't know much, and even though they do as the doctors instruct them, the patients are sometimes infected. (BD, Family carer, 004).*

The other family carer from Bangladesh also expressed a similar view about holding more responsibility in IPC empowerment than their patients.

> *The responsibility for infection risk goes on both sisters and us in this hospital. We eat something and throw away the waste here and there at the hospital. Flies go on it, and it also goes over patients. So, I have more responsibility than the sisters (nurses). The government provides a waste box in the hospital. They told us hundred times to use these boxes when we eat. It is our duty, isn't it? The duty goes more to us. I have more responsibility than sisters. (BD, Family Carer, 003).*

Education but no empowerment

Many HCWs stated they provided IPC education to patients and their family carers. However, none of the participants mentioned explaining IPC empowerment or engaged them in a more participatory approach, such as asking their family carers or HCWs to wash their hands. This suggests that HCWs primarily viewed patients as passive recipients of care and may not have prioritized empowering them with IPC knowledge or practice. A HCW participant described how the IPC education was usually done.

> *We can gather patients and educate them (patients), to inform them about hand hygiene and such things… first, they (patients) have to be educated to be aware of the risks, then they (patients) could develop their willingness to comply. They (patients) have to be aware to comply. Once they (patients) know, that means they are aware of them. (INA, Nurse, 011).*

The other nurse from Indonesia described the challenges with IPC education but made no mention of IPC empowerment in education.

> *We constantly remind them (family carers) about this, yet it is being ignored. Sometimes they (family carers) said they would take all the risks raised since we had already told them about the risks. More often, the family members are pretty challenging to deal with… I have found some cases where the isolated patient shared food with their family*

members in the room. We informed them about the risk, yet they chose to ignore it. I think it is because of their level of education. Their understanding of the risk might affect their behavior, or they just do not want to be aware, as we already told them. (INA, Nurse, 003).

Similarly, nurses from Korea and Bangladesh stated that IPC education was given to a patient and their carers, but no element of IPC empowerment included.

We print the information about it…and give it to them (a patient and their carers)…if there is a patient in the contact precaution…we give it to them to read…and we explain to them…they are asking us anyway .the same thing…why the germ grows…what it is…so we give the information sheet at first…to a patient and their carer…we put it on the bed .and we told them we had given you the education…we do the education at first like this…(KR, Nurse, 005).

We cannot provide health education all the time. When the patient gets admitted, we tell them (patients). Besides, when we give them medicines, we ask about their health and tell them to do things in certain ways. We tell them to wash their hands or not to worry … Aaa… I meant whenever we see them, we ask them to stay neat and clean as much as possible. (BD, Nurse, 005).

DISCUSSION

Our study brings attention to the current state of empowerment in a specific context where family carers have substantial involvement in patient care activities. Additionally, we delve into the factors that influence IPC empowerment irrespective of resource availability. These factors include concerns related to potential disadvantages and repercussions stemming from hierarchical relationships between doctors and patients, a lack of knowledge about HAI and IPC measures, the interdependent relationship between HCWs and family or private carers, IPC measures considered as a barrier to family connections, misunderstanding of the patient zone, and patients' nonassertive attitude toward IPC empowerment.

Similar to previous studies exploring patient empowerment,[2,10,13,17,18] our research findings also suggest that many participants, including HCWs, express fear regarding the negative consequences of voicing their concerns about IPC to care providers. In contrast to previous studies that primarily focused on the patients' perspectives and challenges in communicating their concerns to HCWs, our study reveals a novel finding. We discovered that patients encounter similar challenges when attempting to exercise empowerment and voice their concerns about IPC measures to their families and private carers. This finding is particularly significant considering the substantial involvement of family carers in providing inpatient care, which is prevalent in many Asian countries. In line with our previous research,[21,31] which extensively examined the extensive participation of family carers in care provision within tertiary-level hospitals, our findings underscore the significant role played by family carers in conducting various care activities within the patient room. Consequently, due to the established caregiver-recipient relationship, patients may feel uncomfortable discussing IPC practice directly with their family carers. This relationship dynamic creates a barrier to open communication about IPC concerns, resembling the dynamic observed between HCWs and patients. Figure 1 illustrates the dynamic interaction between patients, family or private carers, and HCWs in relation to IPC empowerment, highlighting barriers and challenges encountered in the process.

The dynamic of empowerment between patients, family or private carers, and HCWs differ (Fig 1). It is evident from our study that

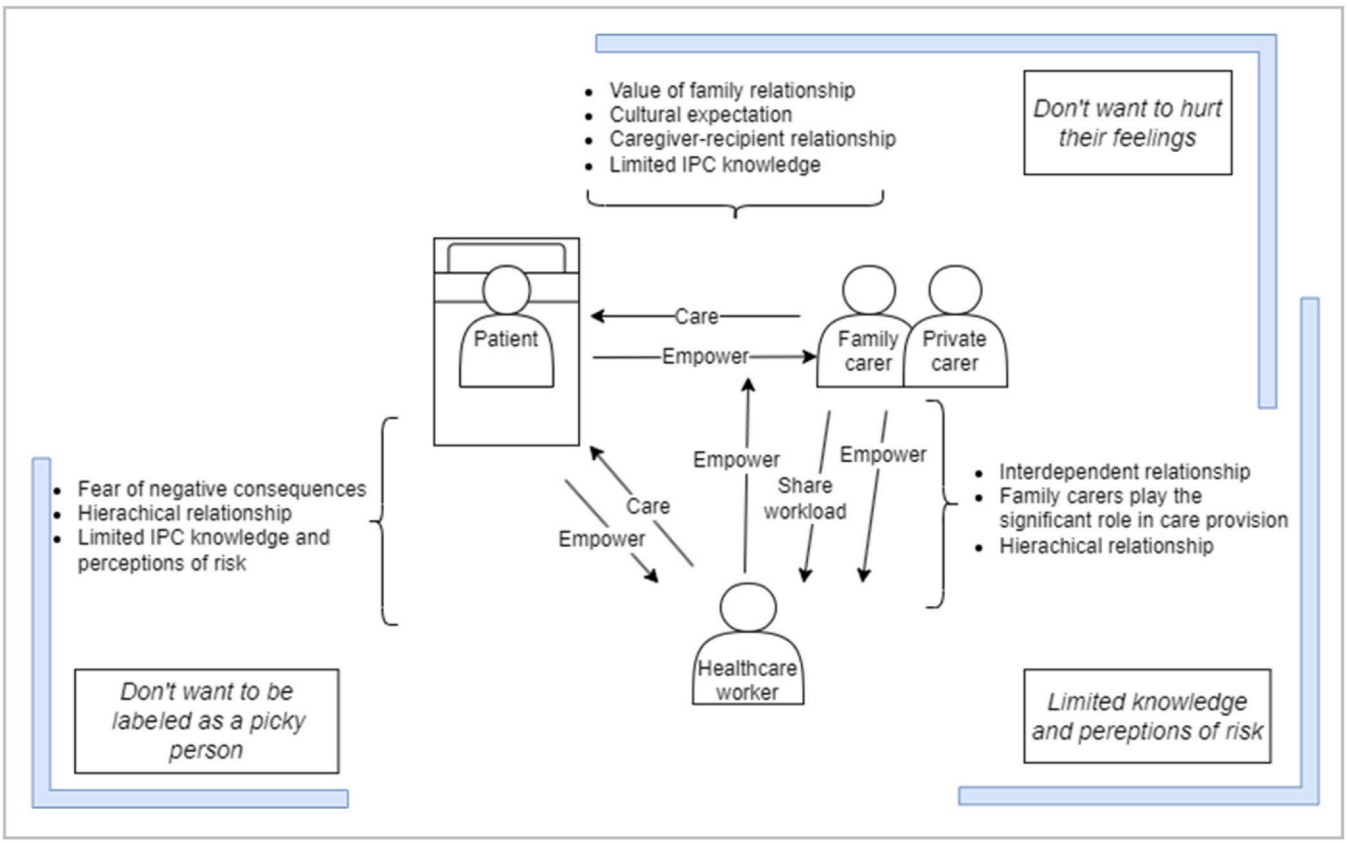

Fig. 1. Patient, carer, and HCWs interaction regarding IPC empowerment: barriers and challenges.

these forms of empowerment may differ in their application, factors, and impact. While empowering patients to remind their carers, including HCWs and family carers, to perform hand hygiene is one aspect, empowering HCWs to ask their family carers to wear face masks involves a different dimension of empowerment. Furthermore, the role of empowerment between HCWs and patient-family carers is different from the former. Recognizing and comparing the roles and influencing factors of empowerment in promoting various types of IPC measures, such as hand hygiene and masking, is essential, especially for the context where family carers play a significant role in care provision.

However, interestingly our study reveals distinct reasons behind patients' nonassertive attitudes toward IPC empowerment, differentiating between HCWs and their family carers. While patients reported the fear of negative consequences in their care was the main reason for their nonassertive attitudes toward HCWs, the primary reason for their hesitancy to speak up toward family carers was the concern of damaging family relationships or disconnection among family members. Many patient participants described practicing empowerment toward their family carers, especially in the dependent relationship, as if they went against family responsibility and cultural expectations. The importance of maintaining the family bond through physical contact was also reported in previous studies from Bangladesh.[32–34] The values of family relationships take priority over the patient-centered approach in IPC empowerment.

Due to this strong bond between a patient and their carers, the role of patients seemed to be overtaken by their family carers in the IPC empowerment as well as other aspects of care, including being informed of their treatment and deciding on their care.[35,36] In our study, many participants indicated that patients became passive care recipients while their family carers acted on their behalf. This is concerning because IPC empowerment is intended to actively engage patients at the center of their care. However, the family-centered approach may hinder patients from being able to speak up to anyone involved in their care, potentially posing an infection risk due to family pressure. A notable aspect of the findings from this study was that, to our knowledge, this is the first study that identified the interlaced relationship between family and private carers and HCWs hindered IPC empowerment. This unique relationship has been developed as a consequence of several factors, which are: (1) family carers are considered as a supplement staff under the shortage of nursing workforce, which has shaped the provision of patient care, (2) family carers function as an unrecognized informal workforce, are operating without any policies and guidelines to govern their roles, and (3) cultural norms surrounding the care of sick family members further contribute to this dynamic.[34–38] By shedding light on the unique challenges faced by the patients and HCWs to empower family carers, whose roles in the provision of patient care are significant and culturally mandated but not officially recognized, this study the need for a multimodal approach. Such an approach should include a review of workload issues, an assessment of the system to ensure IPC policies and guidelines reflect the cultural context, and an evaluation of the cultural practice embedded in the care provision and their implications for IPC empowerment.

Evidence suggests that one of the fundamental elements of empowerment is the acquisition of the necessary knowledge to engage with healthcare providers.[3,13,39,40] Previous studies[9,11] examining patient empowerment also highlighted the importance of knowledge, but their focus primarily revolved around the understanding of HAI and the process of empowerment, rather than the knowledge of hand hygiene and other recommended IPC measures.

In our previous publication involving these participants,[31] it was observed that IPC education for patients and their family carers was often limited or briefly provided, as HCWs tended to assume that patients and their family carers already possessed sufficient knowledge about IPC. This lack of education can be attributed, in part, to HCWs' heavy workloads. Unfortunately, we did not explore the extent to which HCWs themselves received education or instruction regarding IPC measures and empowerment. Lack of knowledge among patients, carers, and HCWs can indeed reflect a lack of instruction, which has important implications for IPC empowerment.

In this study, we identified that many participants misunderstood patient zones and physical contact. Consequently, participants were unaware of the moments that required their carers, including HCWs and their families or private carers, to perform hand hygiene. Thus, they missed out on opportunities to exercise their empowerment to their care providers around hand hygiene and other IPC measures. The patient zone defines as '*the patient and his/her immediate surroundings including the intact skin of the patient and all inanimate surfaces that are touched by or in direct physical contact with the patient such as the bed rails, bedside table, bed linen and infusion tubing and other medical equipment.*[41] Most participants observed the hand hygiene practice of HCWs and their family carers, but due to a lack of awareness of patient zones, they could not exercise their empowerment effectively. Therefore, it could be said that for patient empowerment to be effective in the interruption of transmission of microorganisms during patient care, knowing the right timing to ask and the boundary to determine the patient zone are crucial.

Even though 5 moments of hand hygiene have been widely adopted and mentioned by HCWs in our study, no reference was made to the 5 moments of hand hygiene by patients or family carers when discussing empowerment. This may be linked to the application of a top-down approach between HCWs and patients or family carers when IPC education was provided.[11] The traditional hierarchical relationship between HCWs providing information and patient receiving information was dominantly noted in our study, similar to previous studies that explored patient empowerment.[10,18,42,43] Having no reference made to IPC empowerment in IPC education may be a factor for this.

This study has several limitations. Firstly, a notable limitation is the inability to recruit more than one private carer despite numerous attempts. The limitation stems from the unavailability of private carers during the data collection period. Consequently, having a single participant may not fully capture the perspectives of the entire participant group. However, to address concerns regarding the credibility of the findings, we mitigated this issue by thoroughly reviewing and comparing existing data. Secondly, we encountered difficulty in recruiting a doctor participant from South Korea due to the unfortunate overlap between the data collection period and the transition period for rotating doctors. As a result, we were unable to obtain insights from doctors within the South Korean context. Lastly, although HCWs may have undergone specific training on hand hygiene and IPC empowerment, we were unable to delve into the details of the hand hygiene and empowerment training received by the HCWs due to the scope and design of the study. Despite the limitations, it is important to note that this study represents the first attempt to examine the barriers to IPC empowerment within a unique care environment where family carers are extensively involved in direct patient care, focusing on contextual factors rather than the resource settings in Asia. Therefore, the findings of this study contribute to the understanding of the genuine factors that influence empowerment within this distinct care setting.

CONCLUSIONS

This study has provided diverse perspectives on IPC empowerment and barriers within care settings in Bangladesh, Indonesia, and South Korea. The interlaced relationship between family and private carers and HCWs shaped by social norms of family care provision

hinders IPC empowerment. To effectively address these barriers, it is crucial to acknowledge the cultural influence on healthcare arrangements and its implications for IPC empowerment. Cultural beliefs, attitudes, and traditions play a significant role in shaping behaviors related to infection prevention and control. Tailoring IPC interventions to specific cultural contexts can help mitigate the barriers identified in this study.

In conclusion, this study highlighted the need for a comprehensive approach to IPC empowerment in care settings across Bangladesh, Indonesia, and South Korea. By recognizing the impact of social norms and cultural factors on IPC practices, this could assist developing tailored interventions that address the barriers and promote effective IPC measures.

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SUPPLEMENTARY DATA

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ajic.2023.06.019.

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