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From the nurses' station to the health team hub: How can design promote interprofessional collaboration?

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Interprofessional practice implies that health professionals are able to contribute patient care in a collaborative environment. In this paper, it is argued that in a hospital the nurses' station is a form of symbolic power. The term could be reframed as a "health team hub," which fosters a place for communication and interprofessional working. Studies have found that design of the Nurses' Station can impact on the walking distance of hospital staff, privacy for patients and staff, jeopardize patient confidentiality and access to resources. However, no studies have explored the implications of nurses' station design on interprofessional practice. A multi-site collective case study of three rural hospitals in South Australia explored the collaborative working culture of each hospital. Of the cultural concepts being studied, the physical design of nurses' stations and the general physical environment were found to have a major influence on an effective collaborative practice. Communication barriers were related to poor design, lack of space, frequent interruptions and a lack of privacy; the name "nurses' station" denotes the space as the primary domain of nurses rather than a workspace for the healthcare team. Immersive work spaces could encourage all members of the healthcare team to communicate more readily with one another to promote interprofessional collaboration.

Keywords: Case study, communication, interprofessional collaboration

INTRODUCTION

Interprofessional collaboration is "an active and ongoing partnership, often between people from diverse professional backgrounds, who work together to solve problems or provide services" (Barr, Koppel, Reeves, Hammick, & Freeth, 2005, p. xxii). Professionals should be able to contribute to patient care in a non-hierarchical manner which generates an environment with a collaborative working culture (Bluteau & Jackson, 2009). The World Health Organization

(2010) proposes that collaborative practice is shaped by institutional supports, working culture and environmental mechanisms, and influences the existing collaborative culture of an organization. Nurses' stations in a hospital are contact places for nurses, doctors, allied health professionals, service staff, patients and visitors. There is little research that explores how design of a nurses' station can promote a collaborative culture and facilitate interprofessional collaborative practice. This paper explores the influence of nurses' station design on collaboration and interprofessional working through a qualitative study, which involved three rural hospitals in South Australia (SA).

The nurses' station can be considered the "heart and soul" of the core activities of nursing care of any hospital (Zborowsky, Bunker-Hellmich, Morelli, & O'Neill, 2010, p. 2). The original purpose of the nurses' station was for the observation of the patient. Over time, nurses' stations have been redesigned and refurbished to fit with the requirements of the role of the nurse, other hospital staff, the organization and its culture. One study found that there were around eight different types of nurses' station designs (Catrambone, Johnson, Mion, & Minnick, 2009). The main purposes of nurses' stations are cited as patient observation, patient safety, record keeping, making phone calls and team communication with consideration given to walking distance, noise, comfort, protection, downtime and access to resources (e.g. Hendrich, Chow, Skierczynski, & Lu, 2008; Pope, 2010; Zborowsky et al., 2010). Currently, there is a preference toward decentralized nurses' stations or smaller substations which are closer to patient rooms. Decentralized nurses' stations have been shown to reduce the amount of walking the nurses' do and to increase the time spent on caring for patients (Hendrich, Fay, & Sorrells, 2004). However, nurses in decentralized nurses' stations report feeling isolated and find team communication more difficult (Tyson, Lambert, & Beattie, 2002).

Working culture

Communication and teamwork are the two essential ingredients for the provision of safe and quality patient care (AHC Media, 2009). Therefore, the hospital of the future will have to consider increasing collaboration among health providers in its design. Evidence-based design can create patient-centered environments which improve patient safety and staff workflow and collaborative culture (Stichler, 2007).

Our current health system is under threat due to shortages of health professionals, combined with an aging workforce (NHHRC, 2009). In the Australian rural environment, healthcare is provided to a widely dispersed population, yet services are smaller with fewer resources including health professionals (Bourke et al., 2004). In the rural context, health professionals are generalists who work closely and are interdependent on one another. A rural hospital is part of a close knit community, making confidential conversations important for both patients and healthcare providers. This highlights the need for trust and integrity in interprofessional collaboration.

While collaboration has been reported to positively impact on the quality of care (e.g. Hojat et al., 2003), studies also reveal difficulties with the developing collaborative relations (e.g. Weinberg, Cooney Miner, & Rivlin, 2009). Indeed, studies have revealed that interprofessional tensions often exist in hallways and corridors of hospitals (e.g. Miller et al., 2008). We argue that hospital design can have an influence on the patterns of interactions between the health professionals. Health team hubs may provide shared “turf and territoriality” and foster support to assist collaborative relationships, reduce tensions and boundaries between professionals (Taylor-Seehafer, 1998). Jones and Jones (2011) have demonstrated that relocating a ward space changed the geographical boundary, and this had a positive impact on collaborative practice.

Institutional and environmental supports

Healthcare errors are a result of the interplay between system failures and human factors, ranging from ergonomics to the culture of an organization (Valentin & Bion, 2007). Environmental mechanisms include the built environment, facilities and space design (WHO, 2010). Environmental influences and geographical space also relate to the formal and informal ways that communication and information transfer occurs. This includes how ward rounds, discussions about patient care and patient handovers occur (Manias, 2010). Furthermore, physical space in the workplace should not reflect a hierarchy of positions and be developed to better facilitate communication and avoid barriers which impede it (WHO, 2010). In SA, the State Government’s plan for country health is to form geographical regional systems of care, and has thus far resulted in small rural hospitals close together being merged to become a network-wide facility. Heinemann and Zeiss (2002) suggest that these types of structural changes increase reliance on new technology and require new ways of communicating and working together. Furthermore, they suggest that clinical teams are highly

influenced by the organizational structure and systems, especially those which provide inpatient care.

Among the human factors that can influence healthcare, providers’ belief systems are schema. Schema, such as mental models, can also affect an organization’s culture. They shape how healthcare stakeholders structure their social relations, and perform their work (Hoff, 2010). Schema therefore can shape working environments, influencing interactions, group dynamics, group behavior and the level of collaboration.

Institutional support mechanisms such as shared operating resources and procedures imply that responsibility for healthcare delivery is also shared (WHO, 2010). However, the last two decades in Australia have seen a shift in organizational structural change with implications for professional autonomy and interprofessional relationships (Boyce, 2006). It is common in the Australian rural environment for medical providers to be external to the hospital system, being self-employed in private practices and transient visitors to the hospital. Similarly, allied health is becoming another subculture of independent practitioners (Boyce, 2006). Such divisions of the healthcare workforce complicate the boundaries between the acute hospital care system and the community healthcare system. The separation between the systems means that each has different responsibilities and administrative and financial structures which may produce tension and makes the seamless provision of care difficult (Hellesø & Fagermoen, 2010).

Theoretical framework

Bourdieu’s (1989) theory of social space and symbolic power can assist us to understand the ways in which the culture of the nurses’ station can be conceptualized. The notion that social structures and processes, as features of culture, can privilege or constrain the processes of social location (Lynam, Browne, Reimer Kirkham, & Anderson, 2007). The nurses’ station is physical space around which social relations are constructed which forms the basis of the relationship between the nurse, other healthcare providers, visitors, patients and the rest of the organization. We argue that the nurses’ station has become a permanent and social position within a hospital as it seeks to assemble and unify a group who work closely together in a social space. This social space is an important aspect of the habitus of its occupants. The concept habitus explains how actors are influenced by the social spaces in which they participate (Lynam et al., 2007). The nurses’ station is not only a physical space, but is a symbolic space, which may imply a certain status. Bourdieu (1989) suggests that the culture of the social space is determined by those within. Although the nurses’ station is a physical space, it also symbolizes and constitutes the field or terrain where relationships are navigated. These concepts assisted us to focus on the influence of the social location of nurses’ stations and also the social conditions which shape them.

METHODS

This paper has resulted from a longitudinal collective case study of three rural hospitals in Australia. The aim of the

study is to explore the influence of interprofessional learning (IPL) on the collaborative culture in rural hospital settings. Each hospital is a separate unit of analysis or case. Case study is a method of empirical enquiry that “investigates a contemporary phenomenon in depth and within its real life context” and relies on multiple sources of evidence (Yin, 2009, p. 18). Phase 1 explores the current collaborative culture of each rural hospital. Phase 2 was an intervention phase which introduces a series of interprofessional education (IPE) sessions into the hospitals and Phase 3 will be the follow up 5–6 months later to determine the impact of the IPE sessions. Ethnographic methods were used to collect data for phase 1 of the study which included fieldwork observations and semi-structured interviews. The issue of space and design influencing interprofessional working became evident from the analysis in phase 1. This paper addresses the question of how design might impact on interprofessional collaboration.

Ethics approval was provided by the relevant SA Health and Flinders University committees. Medical practices and the hospital staff were approached to participate in the study, and consent was obtained from all the staff and visiting professionals that were observed and interviewed. All three hospitals chose to be anonymous in the study.

Study sites

The rural health services in SA are divided into Health Clusters based on geographical location. The distance between hospitals within the same cluster can vary and potentially fall within a large area of the state. Two of the rural hospitals, Hospital 1 (H1) and 2 (H2), are part of the same Health Cluster and the other rural hospital, Hospital 3 (H3), is situated in another Health Cluster. The provision of services is similar in each hospital including acute, medical and surgical, 24-hour emergency department and outpatient units. Only one hospital provides maternity services (H2). Bed numbers in each hospital ranged from 19 to 26. Each hospital operates under a General Practitioner (GP) service, where all patients are admitted and managed by GPs who are visiting medical officers as opposed to being salaried by the public health sector.

H1 and H2 are located in a region around 30 minutes drive from urban areas with a reputation for quality local production, predominantly wine and cheese making. These hospitals service a population of 10,000 people. Approximately 200 km from the city, H3 lies in a service town for outlying rural areas which farm sheep and grain. The population including smaller surrounding towns is approximately 600 people.

Data collection

Thirty-three interviews, one focus group and 44 hours of ethnographic observations were undertaken during 2010. The participants consisted of nurses, administrative staff, GPs, physiotherapists, paramedics and ancillary staff. The observations and interviews took place over 9 days (3 days at each of the three rural hospitals) between the hours of 0645 and 1700. Observation periods ranged 2–4 hours at one

sitting. The researcher did not enter any of the patient’s rooms. An observation tool was designed by the researcher to provide a framework to describe the people, tasks, events, relationships, hierarchies, interactions, conversations, roles and behaviors observed. The tool consisted of five categories: setting, roles, activities and interactions, communication, collaboration and teamwork. Handwritten notes were unstructured and descriptive. The researcher spent a period of time in each nurses’ station and was positioned to be unobtrusive as possible. In H3, the nurses’ station was so small that when the room got busy, the researcher would observe through a glass window from another room. Observations were also undertaken in busy corridor areas.

Interviews were conducted one-on-one in an area of the hospital chosen by the participant and thought to be private, convenient and quiet. This was not always achieved due to the unpredictable nature of the hospital environment. There were eight semi-structured questions designed to explore how staff perceived their working environment and understood IPL.

Analysis

Written field notes and researcher reflections were coded into the categories from the observation tool manually. Interviews were transcribed and coded by one researcher (LG). Coding looked for patterns and relationships in the data to build on direct interpretations. Naturalistic generalizations for each hospital were developed from the data following identifying key issues in field notes. The initial findings were discussed and supported by the other three researchers (DP, LS and JG). The researcher then further coded the data to look for explanations about participants’ perceptions and behaviors to further understand the relationships in the rural context. The researcher consulted the literature to assist with understanding the data. Differences between cases (each hospital) were explored. A final level of coding probed deeper using the four concepts of collaboration – sharing, partnership, interdependency and power (D’Amour, Ferrada-Videla, Rodriguez, & Beaulieu, 2005). Interpretations were made about how the themes demonstrated the current collaborative culture of each rural hospital. All the researchers agreed with the themes and interpretations which also add to the validity of the study.

Validity and reliability

Validity was established by collecting data from multiple sources such as the researcher’s case study notes, field’s notes and interview transcripts. Sources of evidence have been collected from a diverse number of health providers as well as three different hospitals. Reliability was addressed through the maintenance of a database of all records to ensure that there was a chain of evidence, an approach to ensure that the operations of a study could be repeated with the same results (Yin, 2009). Only one researcher (LG) undertook the fieldwork and interviews and was previously unknown to the participants who assisted in reducing bias in the study.

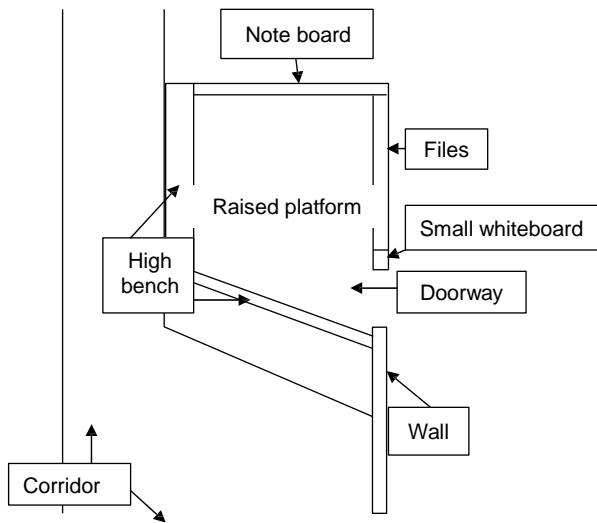


Figure 1. Hospital 1: nurses' station.

FINDINGS

Each hospital had a significantly different physical space for the nurses' station. H1 was open with no structural barriers such as glass windows. The counter was high on the outside but with a raised platform on the staff side (see Figure 1).

H2 was enclosed and had glass windows but had an open doorway. Behind this room was another area for note writing (see Figure 2).

H3 was fully enclosed with a door with glass windows along the front (see Figure 3).

Although each hospital had a different layout, the nurses' station was central to the location of patients. The physical structure of each hospital's nurses' station was ascertained to have a major influence on collaborative practice. Indeed, it was related to the way in which conversations could take place as well as enablers and barriers to effective communication. Communication issues are related to the lack of space and privacy due to the layout of the nurses' stations. The nurses' desk was found to be symbolic of nurses' work.

The impact of space on patterns of communication

In H1 the nurses' station was a high counter with a desk behind it which was not enclosed.

There was no privacy for conversations due to the openness of the station (see Figure 1). There was a lack of space in H1 and H3 nurses' stations, and many conversations were held in the doorways or corridors or in front of the nurses' desk. A physiotherapist who provided care in both H1 and H2 explained she preferred the H1 layout so that she could "yell out to the nurses at the station because they don't have the glass covers and it is a bit more open to people" [IPH1/2].

In H1 when the nurses and doctors wanted a slightly less conspicuous area to discuss a patient they used the adjoining medication room, however there was no door to close. Nurses who prepared medications in this room would

sometimes lower their voices or even whisper when having a conversation. H3 had a glass window stretched across the front of a desk and a door which could be opened/closed led in from its side (see Figure 3). However, the workspace was cramped with a humming noise coming from the electrical equipment which caused people to speak louder. Although the H3 station had the ability to be fully enclosed, the glass windows were sometimes open. Conversations in all three stations were often interrupted by people waiting at the window/doorway/desk, telephones ringing or people entering and leaving the room or area. H2's nurses' station had been renovated 12 months earlier, and the desk area was enclosed with glass windows with the exception of an open doorway (see Figure 2). According to one staff member this was done: "to make it more private [however]... between the doctors and the nursing staff there is not a lot of room" [CHN Int 14 H2].

An adjoining extra room in H2 nurses' station had an area with desk space all the way along to assist with privacy for note writing. There was one computer in this room which was used mostly by the visiting doctors. This layout with the second room encouraged more spontaneous conversations to occur between health professionals and less interruptions for note writing or working on the computer as opposed to the lack of private areas in H3 or the openness in H1. In H1 and H3, case notes were often in full view to the public. In H3 there was a resource room around the corner which was used for patient handovers and private discussion. In H1 and H2, handover occurred in the staff dining room.

Communication barriers and enablers

In H1 there was a small whiteboard used by nurses to chart which patients required intravenous medications and to communicate which GP was on daily call. The whiteboard in H2 had power leads running across it from the camera security equipment covering overwritten information. In the H3 nurses' station, there were many handwritten notes posted along the top of the bench such as lists of tasks, faxes to be sent and notes from one "nurse in charge" of one shift to the next. There was no whiteboard. A nurse explained that they only had two GPs who both work half time each and as

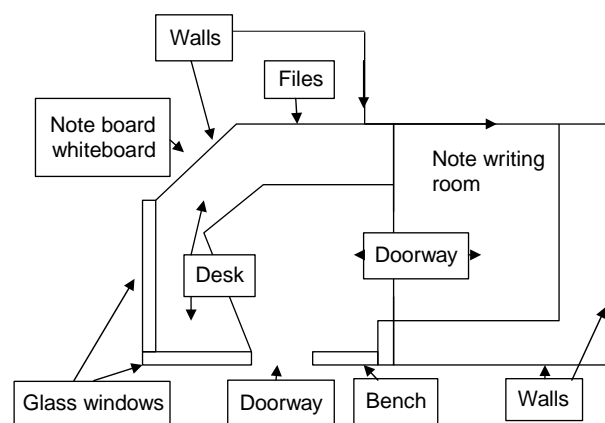


Figure 2. Hospital 2: nurses' station.

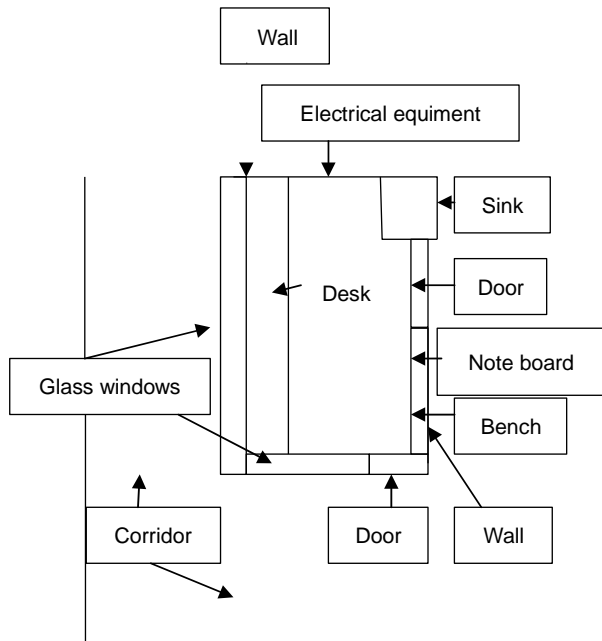


Figure 3. Hospital 3: nurses' station.

a consequence the nurses had to leave “long notes on the table” for them. Most participants agreed that communication was something that could be improved:

There are certain lapses in communication, I think it is personal problems with communication skills and some of the mechanisms aren't always the best, post it notes don't always work very well but sometimes that is how it happens. [Nurse Int. 23 H3]

The apparent lack of face-to-face communication was explained by a GP who was frustrated when he comes to the hospital to review a patient:

My interface is to try and look after the patients, to find out who is looking after a patient, someone who knows some information to pass things on. There is no system for me to find out and I have to interrupt someone to find out. There isn't something on the board ... [there] used to be an RN who would know about all the patients and I would be able to get all the information from her. [GP Int. 16 H2]

The successful collaboration of health professionals appeared to be dependent on their availability and accessibility. While the doctor above related his frustration with the system of communication, the nurses sensed that doctors were not making themselves available for clinical issues:

I think that is the challenge of the doctors getting buy in on the idea and participation [for IPE]. Sometimes you can reluctantly get them there dragging their feet but we find it hard enough just to get them to a meeting once a month, just to discuss generic clinical issues let alone other things. [Nurse Int 23 H3]

Many participants also mentioned the fact that allied health workers were not readily available as they were located

in a separate building and required a formal referral to access care.

Symbolism of the nurses' station or desk

The nurses' station was described by participants as a way of defining what nurses do. One doctor mentioned the “desk” during his interview when describing the responsibilities of the nurse:

I am not sure whether it is speaking out of turn but I think the focus now is much more on writing up drugs and chatting at the desk, it is not holding patients hands ... That has changed a bit over time, part of it I think is the baby boomers, generation x, post war shift and changes the way nursing is done as it were, it has become more of a task and less of an interactive enjoyable thing that you do with the patients. And it is certainly very individual; there are individuals who are constantly in the patients pocket and those who are constantly at the desk... [GP Int 8 H1&2]

This is in contrast to another GP (Int 16, H2) who mentioned that nurses could be difficult to find if they were undertaking patient care at the bedside. The GP above may have implied that nurses who were at the “desk” having a conversation are not fulfilling their role.

DISCUSSION

The statements offered by the participants in our study on the surface appear to be due to frustrations with a rural system of healthcare. However, they may also be a result of each health professions differing understandings of other health professions roles and responsibilities. In particular, there was confusion about the role of the nurse as being available as a person to both pass on information and care for patients at the bedside. These findings echo a recent study where nurses and medical and surgical residents did not share goals or understand each other's roles (Weinberg et al., 2009).

Studies have explored the issue of health professionals' preference for face-to-face or synchronous communication over asynchronous communication using notes and email (e.g. Alvarez & Coiera, 2006). The rural healthcare providers in our study portrayed that synchronous communication is more valuable and that seeing someone “in person” can act as a trigger for passing on information. Zborowsky et al. (2010) argue that work environments for nurses should support the functional as well as their psychological needs in order to promote better patient care. Hendrich et al. (2008) found that nurses spent a lot of their time in nurses' station undertaking tasks such as documentation, communication and management of medications, and suggest that improving the physical design of nursing units could assist the paradigm shift to collaborative care. In our study it was observed that areas where the healthcare team sat down to write notes equated with the place where discourse took place, both social and professional. Upon reflection, the nurses' station in H1 and H3's main function was a place for the visiting

health professional to find the patient notes and rather than an opportunity to exchange information with the nurse responsible for the relevant patient. Our findings further suggest that both synchronous and asynchronous communication were not ideal or always achieved and this could be due to the space design.

Bourdieu (1989) explains that observable interactions within a physical space can “mask the structures that are realized in them” (p. 16) and those structures which determine an interaction are invisible. This concept can help us to understand the nurses’ station being a symbolic space and a form of symbolic power. Bourdieu (1989) explains that symbolic power is influenced by one’s habitus, as a sense of one’s place and the place of others. In our study nurses and doctors seemed dissatisfied with each other’s division of labor. Health professional relationships can be affected by power relations and each person’s own professional identity. For Wackerhausen (2009) professional identity, like schema, can be embodied in everyday routines and habits, and are driven by forces of habit. He goes on to describe habituation as “undisturbed barriers to interprofessional collaboration” (p. 463). Therefore, the interactions which occur in the nurses’ station are seen as legitimate and institutionalized, which is a form of social capital. There is an existing power within the social space of a nurses’ station which can produce social divisions. Therefore, the nurses’ station itself may imply a “separateness” between the nurse and the doctor, which compounds existing perceived dissatisfaction with one another’s ways of working.

Consideration in future design could be to provide ample desk space and a functional “offstage” area, where the staff are not “on show” to the public (Brown, 2009). The benefits

would be privacy for discussions and patients notes, and space for a whiteboard. A functional area for discourse and note writing nonetheless would not be without interruptions, but can offer a place for casual conversations to exchange information and assist to build peer relationships (Hedberg & Larsson, 2004).

Chiang (2010) proposes that while improved technology allows nurses to work closer to the bedside, nurses are still the “gatekeepers” of the unit as well as the greeters, so it will also be important to have a central area which is open to the public. Three levels of workspace have been suggested in the literature to promote team-based work. These include curbside space for standing work, informal or impromptu conversations, quick documentation, step-in space for sitting, documenting and phone calls and small team meetings, and immersive workspaces for patient handovers and education with resources such as projectors and whiteboards (Chiang, 2010; Steelcase Inc., 2005). An example of a collaborative immersive workspace is provided in Figure 4.

Our study highlights that although the rural healthcare environment relies on teamwork for patient care, the social division of labor between professions and the geographical separation of departments impedes interprofessional practice. A professional’s view of what a “traditional” nurses’ station is may be what blinds them to the social structures and processes that are undertaken within. From an architectural point of view, the nurses’ station is representative of a hospital which can assist design intent (Steelcase Inc., 2005). However, if architectural design is the only reason that we continue to use the term “nurses’ station”, and there is an agreement toward requiring interprofessional collaborative environments, it could be



Figure 4. A care hub provides different workspace areas for health professionals (printed with permission from “Nuture by Steelcase”).

timely to consider creating newly designed interprofessional spaces. The reframing of joint hospital workspaces as “Health Team Hubs” can imply that the ownership of the patient is a joint venture. We concur that more research is required to explore privacy and confidentiality in nurses’ stations and how the quality of communication is affected by the hospital built environment as was proposed in 2005 (AHRQ, 2005). Most importantly, it may be difficult to generate environments with an interprofessional collaborative working culture if we are not prepared to do anything about it.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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