

Positive Working Relationships: How Closeness to the Healthcare System Affects Healthcare Workers' Trust

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ABSTRACT

Background: Trust is essential for effective collaboration among healthcare workers, which is vital for improving patient outcomes, especially in the care of complex conditions like diabetic foot ulcers. As healthcare teams increasingly operate in distributed settings, understanding how trust is built between healthcare worker pairs, both co-located and distributed, is crucial for enhancing teamwork.

Methods: This study investigated the trust-building process among healthcare workers involved in the care of diabetic foot ulcer patients. A total of 39 healthcare professionals, including primary care providers, specialists, and administrative staff, were interviewed across rural and urban settings. Semi-structured interviews focused on trust-building mechanisms, with particular attention to co-location and shared electronic health records (EHRs) as factors influencing trust. Data were analyzed using directed content analysis, with an inductive approach applied to explore trust-related themes.

Results: Findings revealed that trust develops gradually through introductions, communication, and collaboration, with proximity playing a significant role in these stages. Co-located pairs or those sharing an EHR found it easier to establish trust, with informal, spontaneous communication enhancing relationships. In contrast, distributed pairs faced challenges in communication, which complicated trust-building. However, despite the difficulties, trust was still established through timely communication and mutual respect for professional boundaries.

Conclusion: The proximity of healthcare worker pairs, whether through co-location or shared EHR systems, is a key factor in developing trust and facilitating effective collaboration. These findings suggest that improving proximity and communication mechanisms, particularly in distributed settings, can enhance teamwork, leading to better patient care and outcomes in complex cases like diabetic foot ulcers.

Keywords: communication, mechanisms, worker pairs, systems

INTRODUCTION

Trust is a fundamental element that enables effective collaboration and teamwork among healthcare professionals (Baggs & Schmitt, 1997; Fiscella et al., 2017; Lynch, 2018). This trust is essential for improving patient outcomes in various health conditions, such as diabetes and cancer (Lynch, 2018; Noyes et al., 2016). As healthcare teams become more complex, understanding how trust is established is becoming increasingly crucial. The composition and collaboration of interprofessional teams are evolving to include a greater number of healthcare workers from diverse professions, often operating in distributed settings (Barnett et al., 2012; Centers

for Medicare & Medicaid Services, 2021; Noyes et al., 2016; Priest et al., 2006). However, there is limited understanding of how trust forms when healthcare workers collaborate, particularly when they are not in the same physical location (Fiscella et al., 2017; Frankel et al., 2019; Szafran et al., 2018). Investigating this process is essential for facilitating trust development among healthcare worker pairs, interprofessional teams, and broader healthcare systems. Improving trust, especially in distributed teams, is expected to enhance teamwork and, ultimately, patient outcomes. In this paper, we define proximal healthcare worker pairs as those who are co-located and share an electronic health record (EHR). Those who lack one or both of these characteristics are considered distributed. This definition is drawn from the data and closely mirrors terminology used in systems engineering (Bell & Kozlowski, 2002; Fiore et al., 2003).

The care provided by interprofessional teams for patients with diabetic foot ulcers offers a valuable context for examining how trust develops among healthcare workers. Such collaborative care has been linked to a lower risk of major amputations (Musuuza et al., 2020). These teams, typically consisting of five different healthcare professions, share a common objective: to prevent limb loss (Musuuza et al., 2020). Although the precise mix of professionals may vary, common participants include endocrinologists, infectious disease specialists, internists, vascular surgeons, and podiatrists (Musuuza et al., 2020). Many of these healthcare providers work in distinct settings with varying degrees of integration. For instance, the primary care provider and podiatrist are usually located near one another, with one taking the lead in coordinating care and referring patients to other specialists when needed. These other specialists are often located separately, so their interactions are typically limited to one-on-one exchanges (Sutherland et al., 2020). Such distribution can complicate the interactions between healthcare worker pairs, hindering the achievement of their shared objectives (Davidow et al., 2018). The focus of this study is to explore (a) how trust develops among healthcare worker pairs caring for patients with diabetic foot ulcers and (b) how this process differs between co-located and distributed pairs.

Methods

This study is part of a broader investigation that seeks to explore how primary care providers and specialists manage care for patients with diabetic foot ulcers (Sutherland et al., 2020). We opted for a qualitative research approach because there is limited knowledge regarding the care practices of healthcare workers for diabetic foot ulcer patients and the factors that influence these practices. Our methodology is grounded in naturalistic inquiry, which assumes that people create their own understanding and interpretations of the processes shaping their reality (Guba & Lincoln, 1982). The conceptual framework driving the larger investigation examines how health system factors influence interprofessional care and subsequent patient outcomes. Within this framework, the concept of healthcare workers' familiarity with and confidence in each other's capabilities (Bartels et al., 2016) was crucial for understanding how trust is established among healthcare workers. This allowed us to specifically explore how trust is built in collaborative care environments.

Participants

We targeted healthcare workers involved in the care of patients with diabetic foot ulcers. The aim was to continue interviews until no new insights were emerging, reaching a point of informational redundancy (Morse, 2000). Based on our previous qualitative studies (Bartels et al., 2016; Brennan et al., 2015; Kolehmainen et al., 2014), we expected that interviewing 5-8 primary care providers and 10-20 other healthcare professionals would suffice. We reached informational redundancy regarding primary care providers' experiences after six interviews. However, due to the diversity in the roles and experiences of other healthcare workers, additional recruitment was necessary, and we reached redundancy after interviewing 33 healthcare workers.

The recruitment process began by focusing on rural primary care providers, and then snowball sampling was used to identify other healthcare workers with whom they collaborated (Polit & Beck, 2012). This approach successfully recruited rural healthcare workers, but it was less effective for identifying professionals in urban referral centers, as rural providers did not know these individuals well enough to refer them for participation. To address this, we distributed flyers and sent recruitment emails to urban referral offices. Once an urban healthcare worker was recruited, snowball sampling was again used to reach additional professionals. The final sample included a broad range of healthcare workers, from physicians to administrative roles like referral coordinators and schedulers, most of whom worked with both proximal and distributed colleagues. All participants provided verbal informed consent, and the study received Institutional Review Board approval for exemption (2018-0976).

Data Collection

Between September 2018 and July 2019, a female interviewer with three years of qualitative health research experience (but no formal clinical background) conducted semi-structured interviews with each participant. The average interview length was 49 minutes, ranging from 30 to 65 minutes. Although employed by the same healthcare organization as some urban workers, the interviewer had no prior interactions with the study participants. All interviews were conducted in person, with one interview taking place by phone. The interview

guide, adapted from a conceptual model describing how health system factors influence interprofessional care and patient outcomes (Bartels et al., 2016), included questions on trust, such as:

- What contributes to building trust when collaborating with other providers to manage patients with diabetic foot ulcers?
- What constitutes an ideal response from a provider to whom you have referred a patient?
- What causes conflicts when working with other providers?

At the conclusion of each interview, participants received a \$100 cash incentive.

Analysis

The audio recordings of the interviews were transcribed verbatim by trained students, and the interviewer (B.S.) reviewed the transcripts against the original recordings to ensure accuracy. The initial analysis involved directed content analysis, using the conceptual model to explore how health system factors affect interprofessional care and patient outcomes (Elo & Kyngas, 2008; Hsieh & Shannon, 2005). During this process, the theme of trust between healthcare workers emerged as significant. Consequently, we revisited the data and applied an inductive, conventional content analysis approach (Hsieh & Shannon, 2005) to fully explore this theme. We independently coded the data and then discussed our findings to reach a consensus on interpretations (Lincoln & Guba, 1985). All coding was conducted using NVivo 12 (QRS International Inc., Burlington, MA).

Measures to Ensure Rigor

To ensure dependability, we employed member checking to verify the emerging themes related to trust (Lincoln & Guba, 1985). Thirteen participants out of 39 responded to our member-checking queries, all affirming our findings. Transferability was confirmed through a review by a panel of rural healthcare professionals from a cooperative organization representing multiple rural health systems. This group, which focuses on improving diabetes care in rural areas, reviewed the findings to assess their relevance to other settings. To safeguard methodological rigor, our research team regularly consulted with the Qualitative Research Group at the University of Wisconsin Institute for Clinical and Translational Research. This group, composed of several qualitative researchers from diverse fields, met monthly to provide feedback on design, data collection, and analysis, helping to ensure the confirmability and objectivity of our findings.

Results

A total of 39 participants were recruited from seven different healthcare systems (Table 1). Among these, five systems were rural, and two served as urban referral centers. Regardless of their role, all participants agreed that trust among healthcare workers is essential for effective interprofessional care. One vascular surgeon noted, "The more you collaborate, the better you understand each other's needs, and that trust naturally develops." Trust-building between healthcare workers in interprofessional teams was described as a gradual process, influenced by their proximity to one another.

Two key factors related to the healthcare system influenced trust-building: co-location and a shared electronic health record. Being located together and using a unified electronic health system made it easier for healthcare workers to connect. Conversely, those who lacked either of these elements were classified as distributed, making it more difficult to establish connections. This distinction between proximal and distributed dyads emerged as an important aspect of understanding trust development between healthcare workers.

Across both proximal and distributed healthcare worker dyads, trust developed through a series of common steps. These steps included: (a) an introduction, which could occur prior to or during the referral process; (b) communication to coordinate patient care; and (c) working together. The latter two steps were iterative, taking time to foster trust. Proximity played a role in all three stages, especially when healthcare workers interacted. However, proximity had no impact on the final element in the trust-building process: patient outcomes and experiences.

Communication and collaboration were interrelated themes, though more complex than introductions and patient experiences. Effective communication involved exchanging information, often about care plans, and ensuring clear role definitions. One primary care provider highlighted the importance of detailed care plans: "It's crucial to clearly define what follow-up actions will happen—whether it's with the consultant or with the primary care provider, or who will manage wound care. Clear notes about what's expected are key."

Although the need for information was consistent, the manner of communication differed between proximal and distributed dyads.

Working together was distinct but complementary to communication. It involved fulfilling individual roles, maintaining timeliness, being responsive, and respecting professional boundaries. A nurse emphasized the importance of personal accountability: "Carrying your own weight is vital." Referring healthcare workers were also sensitive to the responsiveness of consultants. One nurse case manager remarked, "Trust is built when you hear in someone's voice that they're genuinely interested." Timeliness was a universal expectation. One primary care provider noted, "A good response is when the consultant addresses both the patient's and my concerns

promptly." A wound care nurse further emphasized respecting boundaries: "It's important to share notes, so the referring healthcare worker can see progress while still retaining ownership of the patient." While expectations for teamwork were consistent for both proximal and distributed dyads, the challenges in communication for distributed dyads made it harder for them to meet these standards.

In proximal healthcare dyads, initial introductions typically occurred in person, marking the beginning of trust-building. Introductions were either one-on-one or in groups. An administrative staff member shared, "When I started here, providers would go straight to familiar colleagues, bypassing me. I had to prove myself by showing I could assist them with anything they needed." One podiatrist used grand rounds to introduce herself to other healthcare workers: "I try to give lectures regularly to let people know what I do." These face-to-face encounters were essential for establishing familiarity.

Communication in proximal settings took various forms, including both electronic health record-based and direct communication. At the very least, healthcare workers would send each other copies of notes or use messaging features within the electronic health record. One primary care provider expressed, "When a consultant cc's me on the chart or sends a message with the care plan, it really helps a lot." However, many healthcare workers found electronic communication insufficient for developing a trusting relationship and preferred face-to-face conversations to enrich their collaborations.

Shared clinical spaces also encouraged communication beyond the electronic health record. These spontaneous interactions—whether during patient visits, phone calls, or group rounds—provided ample opportunities for interaction. A podiatrist described the convenience of proximity: "The hospital is just minutes away, so I can quickly pop over, change dressings, and chat." These informal communication channels supported collaboration and strengthened trust between healthcare workers.

Proximity—whether through a shared electronic health record or co-location—facilitated teamwork. Healthcare workers could fulfill their responsibilities more effectively, respond promptly, and avoid stepping on each other's toes. A primary care provider commented on the benefits of the shared electronic health record: "The notes are automatically shared, so we always know what's going on." Co-location also allowed healthcare workers to more easily coordinate care. A nurse described, "Physicians in the clinic can easily reach out for wound consultations. If I have time, I can go over and assist with patient care. Being close makes it much easier."

Effective communication facilitated individual accountability among healthcare workers, fostering responsiveness while reducing the likelihood of overstepping professional roles.

Many healthcare workers highlighted the critical role of time in cultivating a strong, trusting relationship through repeated cycles of communication and collaboration. When working closely with colleagues, these cycles were reinforced by multiple patient interactions. As one advanced practice provider in infectious diseases explained, "The more we collaborate as a team and interact with specific colleagues, the more comfortable we become in sharing patient care." These repeated interactions built a mutual history, enhancing trust. In contrast, healthcare workers who interacted from a distance had fewer opportunities to share patients, which resulted in fewer cycles of communication, leading to weaker trust.

Healthcare workers who were distributed geographically experienced more difficulty in establishing trust compared to those working in closer proximity. One primary care provider contrasted their experiences working with local colleagues versus distant specialists:

"I feel very at ease with the doctors I work with regularly in my clinic. It's a collegial atmosphere, and I can easily ask them questions like, 'Have you dealt with this before? How would you handle it?' But when dealing with external specialists, the system feels impersonal. I haven't met many of them face-to-face, and sometimes I send messages but don't receive responses, or the replies don't address my concerns."

For distributed healthcare workers, the components of building trust—such as introductions, communication, and collaboration over time—were more challenging without co-location or shared access to electronic health records (EHRs). One podiatrist noted, "Trust builds on the personal relationships we form, not because the system facilitates it." Establishing trust for geographically separated teams required substantial effort and time.

Introductions posed a significant barrier for distributed teams, highlighted by the fact that many rural healthcare workers did not have enough familiarity with urban specialists to consider reaching out to them during the study. A diabetes educator explained, "We all aim to work together towards a common goal, but we rarely see one another. I know some names, but I've never actually met them."

For those working at a distance, overcoming the challenge of introductions required more effort. Some found that a simple phone call or video conference sufficed to establish an initial connection. A telemedicine infectious disease physician, accustomed to remote collaboration, shared, "I believe that even a phone conversation, or ideally, a face-to-face meeting, really helps build trust." Some went out of their way to meet in person, exchanging contact details in the process. For instance, one podiatrist recalled meeting a vascular surgeon over dinner, discussing the importance of timely referrals, which laid the groundwork for an ongoing relationship, where he could reach out via call or text.

Once introduced, healthcare workers were more able to engage in meaningful communication, particularly outside the confines of the EHR.

Distributed teams also faced challenges with EHR-based communication, with many experiencing issues related to incompatible systems or poor interfaces. In these cases, healthcare workers often relied on EHR communication, even when they recognized its limitations, because they had few other options. Many assumed that their notes and results were properly communicated to colleagues. As one vascular surgeon explained, "I try to send my notes to the primary care provider, but I'm not sure if they actually receive them or how long it takes." A primary care provider echoed this concern, stating, "It's my responsibility to find the information in the EHR rather than rely on feedback from the specialists."

Healthcare workers who were properly introduced were more likely to engage in communication outside of the EHR. Much like proximal dyads, many felt that communication was more effective and led to stronger trust when it occurred outside the electronic record. A telemedicine infectious disease physician noted, "Communicating outside the EHR gives you a better sense of how the other person approaches problems, something you can't get from their documentation." Some healthcare workers preferred using phone calls or other means of communication for every patient they shared, while others saw EHR-independent communication as a useful backup. One primary care provider explained, "When I refer a patient, I want to be able to contact the specialist to discuss next steps if there are differing opinions."

The success of distributed teams was often tied to the presence of introductions, effective communication (particularly outside of the EHR), and collaboration. When these factors were lacking, teamwork was more difficult. A nurse noted, "When you fax information to another provider and hope they'll know what to do, things often fall through the cracks." As electronic health records became more compatible, timeliness and responsiveness improved. For some, compatible EHRs were sufficient to foster a sense of collaboration. A primary care provider described a positive experience, saying, "When you send a patient to a consultant and get timely feedback, you don't have to chase after their notes." However, some distributed teams who proactively introduced themselves and used alternative communication methods had better outcomes. A primary care provider noted that a consultant who was easy to contact, and who took the time to follow up, made a significant difference: "The infectious disease doctor always calls back to check in and make sure everything is clear."

Rarely, distributed teams who successfully implemented all three steps—introductions, communication, and working together—established lasting, trusting relationships. One primary care provider said, "I've spoken with an endocrinologist on the phone over the years, and while I might not recognize her if she walked into my clinic, I've referred many patients to her."

In both proximal and distributed teams, improved patient outcomes acted as positive reinforcement, fostering stronger relationships among healthcare workers. A vascular surgeon explained, "When primary care providers see their patients improve, they know the system works." Successful patient outcomes encouraged further collaboration. A diabetes educator added, "When primary care providers see positive results with other patients, they're more likely to refer new ones because they trust I know how to handle it."

Patient feedback also contributed to the trust between healthcare workers, highlighting the importance of respectful interactions with patients. One primary care provider remarked, "You sometimes hear from patients, 'That was a great experience,' or 'I wouldn't go back to that specialist.'" Specialists were also aware of the weight patient feedback carried. A vascular surgeon emphasized the significance of good bedside manner, noting, "Availability, affability, and ability are key qualities. Patient feedback is critical." For distributed teams with limited communication, patient outcomes and experiences played a vital role in fostering trust.

Table 1. Provider Roles and Proximity with Respect to the Referring Primary Care Provider (n=39)

Participant role	Proximal (n)	Distributed (n)	Total (n)
Primary care (physicians and APPs ^a)	Ref	Ref	6
Podiatry (podiatrists and medical assistant)	3	5	8
Diabetes education (nurses and dietician)	3	0	3
Wound care (physician, nurses, nurse case manager, medical assistant, hyperbaric oxygen technician)	2	4	6
Home health (nurses)	0	2	2
Infectious disease (physicians and APP)	0	3	3
Administrative support (schedulers and referral coordinators)	1	3	4
Vascular surgery (physicians, APP, nurses, and social worker)	0	6	6
Total	9	23	39

^a Advanced Practice Providers

DISCUSSION

Although the importance of trust in improving interprofessional care and patient outcomes is well established, little is known about how trust develops between healthcare professionals. This study is one of the first to describe the process of trust-building and how it differs based on proximity (Cramton, 2001; Jarvenpaa&

Leidner, 1999; Priest et al., 2006). We found that trust is developed gradually through introductions, communication, and collaboration. Shared successes and good patient rapport also support this process. Healthcare workers who are proximal to one another, defined as co-located with access to a shared electronic health record (EHR), found it easier to build trust compared to those working in distributed settings. Our definition of proximal versus distributed dyads emerged from our data but aligns with concepts in the systems engineering literature (Bell & Kozlowski, 2002; Fiore et al., 2003). Engineering research describes distributed professionals as those separated by time and space and reliant on technology for communication. Studies of distributed teams, especially in global business settings, emphasize the critical role of communication and trust in optimal performance (Cramton, 2001; Driskell et al., 2003; Jarvenpaa & Leidner, 1999; Venkatesh & Johnson, 2002), which corroborates our findings among healthcare workers. This research has important implications for fostering trust at the level of healthcare worker dyads, interprofessional teams, and healthcare systems.

At the level of healthcare worker dyads, our findings align with prior studies on referral patterns, which are directly influenced by trust between professionals (Gregory & Austin, 2016). A survey of primary care providers highlighted factors such as (a) prior experience with the specialist, (b) timeliness, (c) quality communication, and (d) patient rapport as key considerations when choosing a consultant (Kinchen et al., 2004). These correspond to our themes of (a) trust developed over time, (b) timeliness, (c) communication, and (d) patient experiences. Similarly, Choudhry and colleagues (2014) outlined key questions regarding specialist referrals, including:

- How well will the specialist communicate with the referring physician?
- Do both physicians use the same EHR?
- Does the specialist communicate well with patients?

These considerations underscore the importance of communication, shared EHRs, and patient rapport, all of which were central to our findings.

To support trust-building among healthcare workers, our study suggests that currently practicing professionals should prioritize introductions and at least one form of communication independent of the EHR. This may be especially beneficial for distributed healthcare workers. Moreover, healthcare trainees may benefit from formal education focused on these elements of trust-building (Brock et al., 2013; DeChurch et al., 2011; Supper et al., 2015; Sy, 2017).

At the level of interprofessional healthcare teams, we found that trust among team members developed over time, a finding consistent with research on physicians and nurses working together in emergency departments, cancer teams, intensive care units, and primary care settings (Baggs & Schmitt, 1997; Davidow et al., 2018; Friberg et al., 2016; Soukup et al., 2018). In a study of primary care providers collaborating with pharmacists, participants emphasized that trust was earned through experience, not granted based on title or degree (Gregory & Austin, 2016). Given our findings and those in the literature, we recommend that interprofessional teams strive for consistency in membership over time to foster trust. If temporary collaborations are required, it may be beneficial to involve as many proximal team members as possible due to the need for high levels of trust, integration, and interdependence.

At the healthcare systems level, our study found that co-location and shared EHRs were crucial to building trust between healthcare workers. Previous studies support that shared clinical space with opportunities for face-to-face interactions facilitates interprofessional care (Baggs & Schmitt, 1997; Davidow et al., 2018; Szafran et al., 2018). Furthermore, the inability to easily share patient information across systems hinders trust among healthcare workers. Nearly half of U.S.-based physicians report being unable to share clinical summaries, lab results, and patient medication lists outside their practice (Davidow et al., 2018; Doty et al., 2020). In addition, only one-third of primary care providers report receiving reports from specialists within a week of a consultation (Davidow et al., 2018; DeChurch et al., 2011). These issues erode trust. We recommend that healthcare systems and policies prioritize improving the interoperability of EHRs to foster trust among healthcare workers and enhance patient outcomes.

Despite its contributions, this study has limitations. First, all participants were recruited from healthcare systems in a specific region, and workers in universal healthcare systems or different infrastructures may have different experiences. Second, we did not explicitly inquire about power structures and hierarchical relationships within interprofessional dyads, though these factors likely influence trust development. Third, we did not assess whether proximal and distributed dyads were engaged in collaboration versus teamwork in providing care. However, our data led us to hypothesize that proximity facilitates the transition from collaboration to cohesive teamwork. Fourth, we did not explore whether distributed dyads lacking both co-location and shared EHRs faced more challenges in building trust compared to those missing only one criterion. However, our findings suggest that both factors play a role. Finally, while participants were informed that they would receive compensation for their time, we believe this did not significantly impact their responses, as the importance of trust was emphasized by participants themselves.

CONCLUSION

This study provides an in-depth examination of how trust is developed between healthcare workers in

interprofessional teams caring for patients with diabetic foot ulcers. Key factors in building trust include introductions, communication, collaboration, and positive patient outcomes. Proximal dyads—those who are co-located and share an EHR—find it easier to build trust than distributed teams. Our findings suggest ways individual healthcare workers, interprofessional teams, and healthcare systems can help support trust-building, which is essential for improving team performance and patient outcomes. Further research is needed to develop systems and teams that support trust, particularly in distributed settings where healthcare workers face the most challenges in establishing and maintaining these crucial connections.

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