Interprofessional Practice and Education

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Alan W. Dow, Deborah DiazGranados,
and Marianne Baernholdt

Introduction

Healthcare has been described as a complex, adaptive system (Lipsitz 2012). A complex system has multiple parts—in the case of healthcare: clients, their families, healthcare workers, facilities, technology, and medications, among others. With the proliferation of technology, medications, and ways of delivering care over recent decades, the healthcare system has become increasingly complex, perhaps best exemplified by the increasing number of people with a greater chronic disease burden (Hajat and Stein 2018). To function optimally, healthcare must remain adaptive to the needs of individual patients and broader communities. The parts of the complex system can interact in many different ways, and adaptation should be driven by individual clients and their families' needs. Better interprofessional practice is one of the key strategies for the healthcare system to manage this complexity and effectively adapt to patients' needs.

The benefits of enhanced interprofessional practice have been articulated for nearly 50 years (Institute of Medicine 1972). The negative consequences of poor interprofessional practice were identified as a leading cause of both harmful medical errors and overall gaps in health services' quality (IOM 2001). However, done

A. W. Dow (✉)
Medicine and Health Administration, Virginia Commonwealth University,
Richmond, VA, USA
e-mail: alan.dow@vcuhealth.org

D. DiazGranados
Wright Center for Clinical and Translational Research, School of Medicine, Virginia
Commonwealth University, Richmond, VA, USA
e-mail: diazgranados@vcu.edu

M. Baernholdt
School of Nursing, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA
e-mail: marianne_baernholdt@unc.edu

well, effective interprofessional practice, through which healthcare workers in a complex adaptive system are continually working together to improve care, can create a learning health system that continually works to provide even better care (Institute of Medicine 2013). This aspiration has been embraced by the National Collaborative for Improving the Clinical Learning Environment (NCICLE), representing more than 30 professional organizations (NCICLE 2020). NCICLE was formed to promote the reciprocal relationship between clinical learning and patient safety, focusing on interprofessional relationships. Similarly, the correlation between the quality of interprofessional practice and the well-being and retention of healthcare practitioners has been emphasized (Dow et al. 2019; NAM 2019).

However, despite this policy basis for interprofessional practice, linking interventions to enhance interprofessional practice to improvements in patient outcomes has been challenging (Reeves et al. 2017). Changing professional interaction patterns is difficult, and targeted health outcomes often require a long period of follow-up. As such, frameworks, especially the QHOM (Mitchell et al. 1998), are needed that provide a more complete understanding of the relationship between interprofessional practice and improving health. Moreover, frameworks are needed to help develop, implement, and assess interventions to improve patients' care quality.

Interprofessional Practice: Linkages with the QHOM

Although Donabedian's structure-process-outcomes model (SPO) (Donabedian 1988) has long been the leading framework for understanding health outcomes, the QHOM provides a more complete framework for understanding the complexity inherent in how interprofessional practice affects health (see Fig. 10.1). The Donabedian model separates inputs and processes and describes them as linearly related to outcomes. In contrast, the QHOM model describes an interdependent relationship between the client and the system and the outcomes those interactions generate. Outcomes are not static but rather inputs as feedback to the client and the systems. This feedback is essential for adaptation in complex systems.

Unlike the Donabedian model, the QHOM model defines the role of interventions. Interventions capture a broad range of activities. Examples include a training program to improve interprofessional collaboration, adding a new health professional/discipline into a clinical environment, or changing how payment incentivizes care. Each of these may target the interprofessional team and could be seen as an intervention to change interprofessional practice. Importantly, in the QHOM, interventions do not lead to outcomes; instead, interventions work through the complexity of the healthcare system and clients' lives to impact outcomes. The QHOM helps us better understand the system.
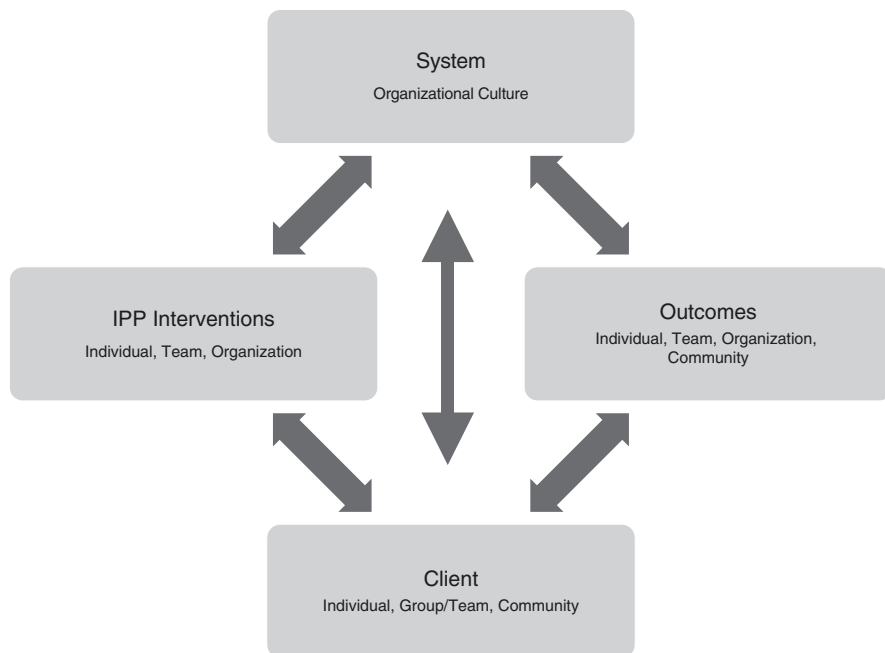
Fig. 10.1 Framework for interprofessional practice

Interprofessional Practice and Education Within a Complex System

What Is Interprofessional Practice?

All health professions adhere to a common value base, that is, improving the human condition. However, each profession has different professional traditions that are, in part, represented by different scopes of practice. Interprofessional practice sits at the intersection between a client's right to receive the best available healthcare and the profession-specific values and abilities each profession can bring to bear to help a client. This intersection can be a source of conflict or a synergy source, depending on the quality of interprofessional practice.

Nevertheless, how best to define interprofessional practice remains debated. The most commonly accepted definition from the World Health Organization (World Health Organization 2010) states that collaborative practice is: "… when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across settings." This definition is functional but does not capture the power dynamics between professions or the influence of broader system forces such as payment and regulation on collaboration between different health professions.

In contrast, Fawcett argues that there are at least two views of what constitutes IPP/IPE. The first is that IPP is a team-based collaborative practice where "the members of each area of healthcare have distinct roles and role activities that do not overlap as they engage in collaborative practice" (Fawcett 2014, p. 178). The second view focuses on interprofessional practice, which is derived from the explorations of interdisciplinary research. In this view, "an integrative and reciprocally interactive approach that actualizes a synthesis of diverse disciplinary perspectives leading to a new level of thinking about … a topic or even a new discipline" (Fawcett 2013, p. 376). In this view, the roles and activities are unclear because the boundaries of specific discipline knowledge are blurred. Fawcett captures the tension in collaboration between shared knowledge and profession-specific expertise. Several national organizations have opined that the effectiveness of interprofessional practice is only optimized when all team members contribute fully and equally from their distinct disciplinary perspective (Hawkins et al. 2018; NAM 2013; Perlo et al. 2017). This opinion integrates Fawcett's second articulated perspective on interprofessional practice into the WHO definition. It begs the question of when does interprofessional interaction become of high enough quality to be described as interprofessional practice? This question remains unanswered.

Contrasting Interprofessional Education and Interprofessional Practice

Interprofessional education is defined by the WHO (World Health Organization 2010) as "… when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes." Although both IPP and IPE require interaction between individuals from different professions, interventions to enhance IPP seek to improve health outcomes whereas IPE targets the learning of the individuals involved (Oandasan and Reeves 2005). Educators have delivered IPE activities in various venues, including classrooms, simulation centers, and clinical areas. Most impact assessments are short-term and focused on attitudinal changes rather than generalized and maintained behavior change that impacts patient outcomes (Abu-Rish et al. 2012). Whether IPE is effective and how best to deliver it are unknown (Reeves et al. 2013).

The effectiveness of IPP and IPE is thought to depend on the quality of collaboration between the healthcare professionals involved. Fawcett (2014) writes how IPP may be similar to team science, where there is a need for those involved to engage in knowledge integration. The process of knowledge integration requires that individuals be willing and capable of integrating knowledge from other professions (Cronin and Weingart 2007), consistent with both attitudinal and cognitive learning needs from IPE. For example, each team member should have a shared definition of the problem and patient case and how each profession fits into the patient's care. When a sense of sharedness is lacking, conflict or errors may occur (Mcgrath and Argote 2001).

Holmboe et al. (2016) suggested that IPE and IPP are implemented best through co-learning where a deliberate flattening of the hierarchy among professions and among teachers and students has occurred. On the one hand, more advanced learners may have already developed a strong professional attitudinal foundation that interferes with interprofessional collaboration. On the other hand, providing IPE to early learners may be challenging because they may not have mastered basic competence in their profession. Early learners may not be ready to actively participate in interprofessional practice as a representative of their profession. How best to time IPE so that it supports effective IPP is still in need of additional research.

Science that Informs IPP and IPE

IPP and IPE have several types of literature to draw from to inform their application and research agendas. For example, educational psychology and its theories of motivation, cognition, and engagement (Arkes and Garske 1977; Snow 1989; Tittle 1994) are critical for informing how activities are prepared and delivered, and most importantly, how IPE activities are framed to learners. Social psychology and research on social identity, self-categorization, and social comparison provide the underpinnings of what to consider when approaching training or education activities in IPE and IPP (Goethals 1986; Hogg and Terry 2000; Tajfel 1982). Organizational psychology informs IPP and IPE through research in team dynamics (Rosen et al. 2018), systems theory, or leadership and followership. In addition to these research areas, there is a growing literature base that is interdisciplinary in nature and can inform the work of IPP and IPE initiatives (Fiore 2008; Poole et al. 2004; Van Swol and Kane 2019).

Characteristics Important for Interprofessional Practice

One approach to conceptualize the factors impacting IPP or IPE is micro/meso/macro levels (Oandasan and Reeves 2005). Microlevel factors are at the level of the individual. These include psychological states such as attitudes toward collaboration and personal knowledge, such as understanding of different scopes of practice. IPE interventions typically target micro factors.

Meso-level factors span from the team level to the organizational level. These might include how an organization's leadership and chain of command are structured or how different professions are deployed to support optimal patient care and collaboration. IPE interventions at the meso level are often focused on training teams at the unit level. In comparison, IPP interventions may be broader and not even recognized as interventions that positively or negatively impact IPP.

Macro-level factors work at the societal and political level. Payment, licensure, and malpractice systems are macro-level approaches that can positively or negatively impact IPP. Recent work on accreditation standards for IPE is an example of

IPE interventions at a macro-level. Like meso-level interventions, the impact of a macro-level intervention in IPP in a discrete care setting may not be considered.

The QHOM helps consider how an intervention might be translated through these levels of impact. A macro-level intervention may have unanticipated micro-level effects for practitioners or clients, such as providing altering pathways to access care by changing payment. Conversely, macro-level change generally stems from problems identified at the micro and meso levels in providing optimal care to clients and communities. This complexity and interdependence are central to the QHOM.

Organizational Culture

Because the QHOM is grounded in systems theory, congruence is an important concept. Congruence theory (Nadler and Tushman 1980), a foundation for understanding systems theory, explains that when there is congruence or fit among tasks, interventions, people, structure, and culture, there is a higher level of effectiveness. One manifestation of a system is organizational culture. Organizational culture can be defined as the shared assumptions, values, and beliefs that characterize a setting and shape all work activities (Schneider et al. 2013). In healthcare, different cultures exist between organizations/hospital systems, clinical units, or even shifts. All work happens within an organizational system, and that system has, as its background culture.

For interventions intended to improve interprofessional practice, the system's culture defines the process of work, including how quickly and effectively an intervention can lead to change (Gale et al. 2014). Alternatively, an intervention might seek to change the system culture. Although defining and measuring culture are challenging, the QHOM, by embracing healthcare's complex interrelatedness, provides an illustration that may begin to help define cultural differences and the many ways culture may shape the quality and outcomes of care. This type of approach is being applied in the literature focused on interprofessional practice through the realist synthesis approach (Pawson et al. 2005; Pawson 2006) where the driving questions of research are not just "what works for whom" but "what works for whom in which context" (Rycroft-Malone et al. 2012). Drawing from implementation science, this approach has been gaining traction in the IPP/IPE literature; it is beginning to shed some light on how culture shapes work and the uptake of interventions (Hewitt et al. 2014). The QHOM articulates that interventions to improve interprofessional practice are impacted by culture even as they often seek to change the culture. For researchers and others interested in improving healthcare, the QHOM pushes us to question how to conceptualize an intervention.

Also, while studying interventions usually starts from the perspective of the intervention acting on the system and/or the client to lead to an outcome, the QHOM recognizes that the system and client act upon the intervention. For example, many interventions may target an improvement of a system's interprofessional

collaboration. The modified collaboration may affect the fidelity of implementing the intervention, the satisfaction of healthcare workers with the intervention, and, ultimately, how the intervention interacts with clients and impacts outcomes. Interventions may succeed or fail based on qualities of interprofessional practice and may lead to unanticipated outcomes. The QHOM pushes us to embrace the system's complexity and interdependence and all parts of healthcare delivery.

Interprofessional Practice Interventions

Despite the importance of better interprofessional practice from the theoretical and policy perspectives, how best to improve interprofessional practice has been challenging. A Cochrane review of studies through November 2015 found only nine experimental studies of interventions to increase interprofessional practice (Reeves et al. 2017). These studies showed only mild evidence of benefit to patient outcomes. The authors also described the interventions and impact as heterogeneous and stated that it was difficult to draw generalizable conclusions. Unfortunately, even interventions that work within this complex, adaptive system and across micro, meso, and macro levels may take years to manifest benefit (especially for educational or workforce development interventions) and lead to change that is difficult to detect (IOM 2015; Oandasan and Reeves 2005). Controlled trials are often not feasible, are potentially unethical, and may bias findings (Zwarenstein and Treweek 2009). Instead, the complexity integral to these settings requires a more pragmatic approach that recognizes that interventions should be shaped by each patient's needs and the capacity of each setting.

Interventions to improve interprofessional practice seek to change interactions among the healthcare workers and clients in the system to enhance patient outcomes. Interventions that improve interprofessional practice fall into three main groups: interprofessional education, teamwork training, and implementing novel interprofessional care models. The implications of the QHOM to each will be discussed below.

Interprofessional Education

IPE was designated a high-priority area for health professions education in 2003 (IOM 2003). Subsequently, competencies were developed to guide curriculum development (Interprofessional Education Collaborative (IPEC) 2016), and accrediting standards for IPE have been implemented in nearly all health professions (Health Professions Accreditors Collaborative 2019; Zorek and Raehl 2013). IPE has become a global phenomenon, with educational programs developing many different approaches to meet these regulations and aspirations.

There is limited evidence for the benefit of IPE interventions on practice (Illingworth and Chelvanayagam 2017). A Cochrane review of interprofessional education found only 15 comparative studies which were generally positive, but

were described in interventions, participants, and studied outcomes (Reeves et al. 2013). The authors stated that drawing generalizable conclusions was not possible. Meanwhile, most of the rapidly proliferating IPE programs focus on pre-licensure learners. Evaluation of these programs is generally short-term and focused on learner satisfaction or acceptability, often without comparison groups (Abu-Rish et al. 2012).

Why the limited evidence for IPE despite years of intensive investment? Framed within the QHOM, most IPE interventions are distant from the systems of practices and the clients who receive services. Although the need to link IPE activities closer to practice outcomes has been articulated by the National Academy of Medicine (IOM 2015), education and practice remain fundamentally separate despite being dependent on each other for future workforce and faculty (Frenk et al. 2010). The impact of IPE, as currently evaluated, is simply too distant from the challenges it hopes to affect.

How then to proceed with considering IPE under the QHOM? The real benefit of IPE may be in how it impacts systems and specific practitioners. For example, establishing a more complete professional identity for healthcare professionals anchored within an interprofessional approach to work may lead to healthcare workers who collaborate more effectively (Khalili et al. 2013). In turn, these individuals may change systems to support a culture of greater collaboration that can be measured both in measures of organizational cultures and benefits to patient outcomes (Dow and Thibault 2017). However, achieving these aspirations is far from certain despite the QHOM helping to frame this approach.

Team Training

Another approach to enhance interprofessional practice is team training. Team training effectively improves team performance in healthcare across several settings (Hughes et al. 2016). For example, the training of surgical teams has been shown to decrease mortality (Neily et al. 2010). In less acute settings, the benefit of team-building interventions is more mixed (Miller et al. 2018). However, interprofessional team training outperforms team training that is not interprofessional (Hughes et al. 2016). The most effective team training is based on competencies and matched to the clinical context's needs (Rosen et al. 2018). For example, in one study, 25 interprofessional teams from ambulatory, long-term care, hospital, and home health received training over a year to reduce falls (Eckstrom et al. 2016). The strategy adopted across sites differed; for example, adding Tai Chi classes was more likely in long-term care facilities, while ambulatory facilities were more likely to initiate fall screening. Although didactic lectures alone are not effective, workshops, simulations, and team performance reviews are all effective, with the most beneficial approach being uncertain (McEwan et al. 2017).

Nevertheless, team training also faces challenges to implementation in healthcare. As a manifestation of the complex adaptive system, teams form in response to a stimulus, usually the patient's needs. These teams are highly variable and often

unpredictable (Dow et al. 2017; Yao et al. 2018). Also, the number of healthcare workers needed to meet an individual patient's needs is large, making training cumbersome if not impossible. Whereas training a surgical team with fixed members clearly has benefits, developing generalized competency in teamwork through team training may not be beneficial. For example, TeamSTEPPS, probably the most widely used model for team training in healthcare, has been applied to various settings with heterogeneous outcomes, which makes generalization about benefit challenging (Chen et al. 2019).

How then can the QHOM help us apply team training? Some interactions between clients and systems involve consistent, core groups of healthcare practitioners. These groups are promising targets for team training. Beyond surgical teams, outpatient clinics and rehabilitation settings may fit these criteria. In other settings, where team membership is more dynamic, system redesign, as mentioned below, can segment work processes to define fixed teams better and reap the benefits of team training (DiazGranados et al. 2018). When contrasted with pre-licensure interprofessional education, team training brings IPE concepts into the system and closer to the clients. Outcomes become easier to measure, including changes in the overall culture of an organization. Less certain is how a pre-licensure IPE foundation or team training in one setting may translate to a new setting or team.

System Redesign

A third approach to enhancing interprofessional practice is redesigning systems to support novel models of interprofessional work. With this approach, care is constructed differently, typically with professional responsibilities being redistributed across different professional roles with overlapping scopes of practice. For example, over a hundred comparative studies have been done on new collaboration models between pharmacists and primary care practitioners (de Barra et al. 2019). However, these models are not uniformly beneficial (de Barra et al. 2019), suggesting that they need to be shaped to best meet clients' needs in the system's context. Clients generally benefit from these models though the benefit is greatest for relatively specific outcomes, such as hypertension control, and less clear for more complex outcomes such as overall healthcare utilization. During the Asheville Project, a partnership between primary care, community pharmacists, local businesses, and government in Asheville, North Carolina, clients demonstrated improvements in diabetes and lipid control as well as cost savings (Cranor et al. 2003). Clients with the greatest need—type 1 diabetics and the most uncontrolled—benefitted the most (Cranor & Christensen 2003). However, context also mattered; employees of one company had better outcomes than employees from the rest of the companies.

Examining the integration of behavioral health practitioners in primary care tells a similar story. Formalized collaboration between mental health practitioners and primary care practitioners has been shown to improve clinical outcomes for depression (Bower et al. 2006; Thota et al. 2012) and anxiety disorders

(Muntingh et al. 2016). Yet, these models must be integrated into practice in a way that is acceptable to practitioners, clients, and others. Approaches have included shared visits, in-person connections to mental health practitioners known as "warm handoffs," and geographically separated locations for care with structured approaches to sharing care. Closer collaboration is more resource intensive and whether collaborative care is cost effective depends on multiple factors in the care environment, including the method of collaboration, how care is paid for, and whether the benefit is realized by the multiple parties involved, including clients, employers, and insurers (Grochtdreis 2015).

Example of an IPP Intervention in One Healthcare System

A Quality Scholars Program focused on improving care outcomes in a large Academic Medical Center ran for 2 years (Baernholdt et al. 2019). Interprofessional dyads of practitioners—usually but not always a nurse and a doctor—collaborated to tackle a quality issue. They were supported in this work by a didactic curriculum on quality improvement and leadership and project mentorship via a dedicated coach. Before enrolling in the program, each team defined a quality problem and committed to working on that issue over most of a year. What unfolded over the two iterations of the program demonstrates the challenges of interprofessional practice interventions and the utility of the QHOM.

Every team was able to implement changes in the system. From the perspective of implementing an intervention, all were successful. However, the majority of these interventions did not impact the system or clients as expected. Typically, they had no discernable benefit, and teams had to implement additional changes to improve the health outcome that was their focus area. However, some teams did have a demonstrable, beneficial impact on outcomes. For example, one team decreased intensive care unit length of stay, improved patient outcomes, and saved millions of dollars for the health system (National Academy of Medicine 2017). For every team, the system and clients' needs forced them to adapt the intervention they initially designed.

Moreover, which teams would be successful was not predictable from the beginning. Although good ideas, leadership, and dedication were necessary, they were not enough; successful implementation depended on the unit's preceding care patterns and willingness to adopt a new care approach. Teams needed to try many approaches and continue to adapt and measure impact as they discovered what worked within each individualized context.

As the QHOM illustrates, it is not just the outcomes that are important but the relationship between the components. A redesigned model of practice may not translate across different contexts and cultures. Similarly, benefits accrued to the system, such as improved interprofessional practice, may not always benefit clients or other stakeholders.

Summary and Future Directions

The utility of the QHOM for interprofessional practice helps us understand the relationship between interventions and the other model components within the complex adaptive system of healthcare. As interventions act on the system, client, or both, each component of the system shapes others bidirectionally and leads to outcomes at both the system and client level. Interventions, being distant from outcomes and shaped through the system culture and unique client characteristics, may have outcomes that are unpredictable and often challenging to measure.

The QHOM helps us appreciate healthcare complexity and the importance of asking how components interact and influence each other. The QHOM adds this complexity to the SPO model and admits that structures, processes, and outcomes are interdependent rather than static antecedents and results. Processes can change structures, and outcomes shape both. In terms of interprofessional practice, the QHOM identifies that our healthcare workers are always adapting to each other, clients' needs, and the setting's constraints. The QHOM provides the freedom to make these changes so that health outcomes can be best achieved based on the moment's capacity.

In the QHOM, moving interventions from being intermediaries between structures and outcomes to antecedents that impact both systems and clients to create outcomes—sometimes unexpected—changes the perspective. Leaders, researchers, or policymakers seek to "do" something. Framing this "doing" as an addition to the environment that impacts the system and the clients more accurately represents the approach to improvement.

All of this helps consider interprofessional practice differently. Applied to interventions that seek to increase interprofessional practice as a way of improving health outcomes, the QHOM offers these guiding principles:

1. Interventions with a long-time horizon for impact, such as interprofessional education, must be evaluated by how they impact the relationship between clients and systems that eventually lead to outcomes. As such, interprofessional education may be more about cultural change than changing a single individual's behaviors. Evaluating success through a sociological or organizational lens may be the most appropriate path.
2. The QHOM interrelationships exist within a cultural milieu that determines the capacity for an intervention to impact both the model's proximal and distal components. The needs of clients are both manifestations of this culture and shapers of this culture. As such, how best to meet clients' needs with an intervention depends on system factors that may not transfer from one setting to another. For example, as seen in team training research, the best approach may vary by context. Customization and ongoing evaluation of impact are necessary.
3. Tracking outcomes may offer some insight into a system's strengths and weaknesses and which interventions have a greater chance of success. Suppose a promising intervention fails to improve health outcomes. In that case, the relationship between the component parts and impact on each other should be areas

for troubleshooting how to revamp the intervention. Potentially, a failed intervention may still be beneficial if better adapted to the system.

These principles, stemming from the QHOM, help understand work and its impact on the work better. They move beyond the question of "Did it work?" to questions of "Who did it work for?" and "Why or why not?" The QHOM embraces healthcare complexity with all its interacting parts, especially the collaboration of healthcare workers. Improving healthcare is not simple, but it is work worth engaging to understand the work of healthcare better, how workers engage in it, and how that work can most benefit clients and their families.

The QHOM provides a way to understand the complex healthcare system and how interventions might succeed or fail. The work that has utilized the QHOM and research from psychology, sociology, and communications provides evidence for understanding how to develop practitioners, prepare organizations, and structure tasks for effective teamwork. However, additional work is needed to further our understanding. Primarily our recommendations focus on research that studies teamwork longitudinally and across boundaries in healthcare, studies the conflict across disciplines that may arise and its impact on IPP and IPE, and investigates the context that is the healthcare system and how it has implications for IPP and IPE.

First, there is a need for research to examine how IPP is conducted over time and across boundaries. Patient care often extends beyond discreet short time periods, such as a few hours, and across teams and boundaries, such as several teams of clinicians across different health systems. Therefore, additional research is needed to inform how clinicians' function in these complex systems. Some literature has identified how healthcare can be defined by more complex structures such as multiteam systems (DiazGranados et al. 2014, 2017) and the complexity of care provided to patients. Research needs to be conducted to understand the structures, competencies, and developmental needs of teams.

Second, research should continue to understand how professional identity impacts how teams engage in IPP, and also critically, this research could inform both IPE and IPP initiatives. Moreover, research in this area of how professional identity impacts processes and outcomes can inform training interventions. Might it be that the learners be taught that as they develop their professional identity? That it not only means they identify with being a nurse, for example but that they are also a part of a larger identity of being a healthcare practitioner?

Third, as we have mentioned throughout, healthcare is a complex system; additional research should consider the impact of context on educational and practice initiatives. At the writing of this chapter, the healthcare system had to reinvent providing care for patients during the COVID-19 pandemic. Systems have changed their care for patients to be completely reliant on telemedicine, something that had not been common practice; research is needed to understand the impact of technology on how teams interact. Moreover, technology such as electronic health records (EHR) (see Chap. 6) are central to how teams interact with one another. Additional

research that can inform how to teach learners about the use of the EHR as a team member could benefit team dynamics in healthcare teams.

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