Achieving a climate for patient safety by focusing on relationships

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Abstract

Objective. Despite many initiatives, advances in patient safety remain uneven in part because poor relationships among health professionals have not been addressed. The purpose of this study was to determine whether relationships between health professionals contributed to a patient safety climate, after implementation of an intervention to improve inter-professional collaboration.

Design/Setting. This was a secondary analysis of data collected to evaluate the Interprofessional Model of Patient Care (IPMPC) at The Ottawa Hospital in Ontario, Canada, which consists of five sites. A series of generalized estimating equation models were generated, accounting for the clustering of responses by site.

Participants. Thirteen health professionals including physicians, nurses, physiotherapists and others (n = 1896) completed anonymous surveys about 1 year after the IPMPC was introduced.

Intervention. The IPMPC was implemented to improve interdisciplinary collaboration.

Main Outcome Measures. Reliable instruments were used to measure collaboration, respect, inter-professional conflict and patient safety climate.

Results. Collaboration ($\beta = 0.13; P = 0.002$) and respect ($\beta = 1.07; P = 0.03$) were significant independent predictors of patient safety climate. Conflict was an independent and significant inverse predictor of patient safety climate ($\beta = -0.29; P = 0.03$), but did not moderate linkages between collaboration and patient safety climate or between respect and patient safety climate.

Conclusions. Through the IPMPC, all health professionals learned how to collaborate and build a patient safety climate, even in the presence of inter-professional conflict. Efforts by others to foster better work relationships may yield similar improvements in patient safety climate.

Keywords: inter-professional relationships, patient safety climate, inter-professional conflict, inter-professional collaboration, secondary analysis
professionals were unnoticed in many of the failed attempts to improve patient safety, inhibiting the development of a patient safety climate. Although patient safety climate is an organizational attribute [7], the organization consists of health professionals who work independently or in small groups to provide patient care. Collaborative relationships lead to effective inter-professional practice, which is the key to establishing a patient safety climate and the future in healthcare systems [8], because no one discipline has all of the knowledge needed to promote patient safety and input from all disciplines is required [9].

We conducted a secondary data analysis to answer this research question: how do relationships, exemplified by health professionals’ perceptions of inter-professional collaboration, respect and inter-professional conflict, contribute to a climate of patient safety?

Relationships among health professionals have been commonly conceptualized in the literature as non-technical skills (e.g. task management, teamwork and decision-making) [10], social capital (e.g. social interactions and personal relationships) [11] or networks (e.g. relationships between people) [12]. Relationships between various health professional groups contribute to or inhibit the development of a patient safety climate and have been shown to contribute to patient safety directly [10–12] as well as indirectly. For example, a patient safety project team and international panel of experts recently came up with an evidence-based list of 22 patient safety strategies that should be adopted by healthcare providers [2]. Strategies were divided into two groups: those that the panel ‘strongly encouraged’ and others that were merely ‘encouraged’. Preoperative and other checklists were on the list of strongly encouraged strategies, whereas team training was on the list of encouraged strategies, which somehow seems to ignore the fact that it is not the checklist itself that contributes to patient safety but the communication between care providers (the team) who complete it.

Inter-professional collaboration has been defined as a process in which interdependent professionals engage collectively to meet patients’ needs [8]. Interventions to improve inter-professional collaboration may affect patient outcomes such as length of stay but have been labeled as promising rather than proven in a recent review; because while one study showed a significant decrease in the length of stay, another showed no difference [13]. Respect has been characterized as a moral principle [14] and recognizes the value of patients as persons unconditionally [15]. Mutual respect is a core component of relational coordination and has been found to be a significant contributor to important patient outcomes for surgical patients [16]. Disrespect has been identified as a threat to patient safety, because it inhibits collaboration as well as compliance with practices that promote patient safety [17]. Inter-professional conflict among physicians, nurses and other health professionals may occur because of overlapping competencies and blurred role boundaries between various health professions [18]. Teamwork and effective communication, which are important contributors to patient safety [19], depend on collaboration that can be jeopardized when conflict arises and is not appropriately managed [20, 21]. Moreover, conflict, if left unresolved, contributes to the lack of respect as well [17]. Thus, unresolved conflict may act as a moderator [22], indirectly influencing patient safety climate through the lack of collaboration and respect. We developed and tested a model, proposing relationships between concepts based on our review of the literature. Figure 1 displays our model, which posits that inter-professional collaboration and respect will have direct positive impacts on patient safety and also be moderated by inter-professional conflict, which is posited to have a direct negative effect on patient safety climate. Plus signs in the model indicate positive relationships, whereas minus signs indicate inverse relationships.

The intervention

Several hospitals in Ottawa, Ontario, Canada, merged in 1998 to form The Ottawa Hospital (TOH). Today, TOH is a multisite academic health center with >6000 health professionals deployed in 5 campuses over 110 units/services. The Inter-Professional Model of Patient Care (IPMPC) was an intervention implemented in 2006 to improve interdisciplinary collaboration [23]. Representatives from all health disciplines developed a set of 22 guiding principles to provide the needed organizational structures and processes for inter-professional collaboration and organize the delivery of patient care among all healthcare professionals. The guiding principles are divided into: (i) the care environment and community linkages (10 guiding principles, e.g. ‘the patient and family will have their individual beliefs and values recognized and respected by all healthcare providers’) and (ii) inter-professional teamwork (12 guiding principles, e.g. ‘healthcare providers will collaborate and provide support to foster team spirit and teamwork’). Research ethics approval for the IPMPC was granted by the Ottawa Hospital Research Institute, the University of Western Ontario and the University of Ottawa.

Each nursing unit constituted its own multi-disciplinary team consisting of a clinical nurse manager and health professional co-chair, as well as a representative from each discipline including a physician/surgeon. All 103 nursing unit teams were required to reflect on the guiding principles and decide whether each principle was met, partially met or not met. Then, each team developed and carried out an action plan.

![Figure 1: A model of relationships and patient safety climate](image-url)
specific to its needs; the roll out and implementation of the IPMPC was unique to each team. Support for the roll out of the IPMPC came in the form of education workshops, a series of online, self-directed learning modules, a public awareness campaign for patients and families and a network of advocates within TOH to promote inter-professional care.

As part of the evaluation of the IPMPC, all healthcare disciplines completed anonymous surveys, which contained instruments to measure collaboration, respect, conflict and patient safety climate (among others). The extent to which these concepts interact to contribute to a patient safety climate has not been studied. Yet, given the importance of these relational characteristics to patient safety as described earlier, leaders need this information so that they can develop organizational processes to foster those characteristics that are most influential to a climate of patient safety.

Methods

Procedures

The parent study used a quasi-experimental pre–post survey study design. Envelopes containing invitation letters and questionnaires were placed in employee mailboxes. Subsequent reminders were sent out ∼2–3 weeks later. The implementation of the IPMPC was staggered to healthcare teams in four of the five hospital campuses (one of the campuses did not participate), and evaluation data were collected at three time points. Time Zero (T0) data were collected before the inter-professional practice model was implemented, Time One (T1) data were collected 6 months after the implementation of the model by the last team (12–18 months after the model was introduced to the first teams) and Time Two (T2) data were collected 6 months after T1.

Sample

All subjects from the population of health professionals were invited to participate in the parent study, except for nurses. Due to their much larger numbers, only a random sample of nurses was recruited. Table 1 displays the response rates by profession for all three data collection periods.

Instruments

Inter-professional collaboration was measured with a 17-item, 5-point Likert-type scale with higher numbers indicating higher perceptions of collaboration. This instrument was created specifically for this project and was based on a conceptualization of professional collaboration by D’Amour [24]. Cronbach’s alpha (α) was 0.94 for this study.

Inter-professional conflict was measured with a 7-item, 5-point Likert-type scale with higher numbers indicating higher perceptions of inter-professional conflict. This instrument was also developed specifically for this project (α = 0.84).

Respect was measured with three items on a 5-point Likert-type scale taken from the effort–reward imbalance questionnaire [25, 26]. The three items measure respect, which is conceptualized in the instrument as a component of esteem, and thus a type of reward. These three items have been used to measure nurses’ perceptions of respect in previous work [14]. There were five options for each item, with the first being ‘Agree’, but the other four options ranged from ‘Disagree, but I am not at all distressed’ to ‘Disagree, and I am very distressed’. Given that the instrument did not measure respect on the same type of ordinal scale as the other instruments, the scale was dichotomized prior to analysis so that option one was left as ‘agree’, but options two to five were collapsed and recoded as ‘disagree’ (α = 0.83).

Patient safety climate was measured with an 8-item, 5-point Likert-type subscale taken from the Safety Attitudes Questionnaire [7]. The safety climate subscale assesses the degree to which individuals perceive that their organization has made a commitment to safety; higher numbers reflect higher perceptions of patient safety climate. Seven items came from version one of the safety climate subscale whereas item three came from version two of the same subscale, for a total of eight items [3] (α = 0.79).

Secondary data analysis

For our secondary analysis, health professionals were grouped into three categories: physicians, nurses, and other health professionals. Given that individuals worked on multiple units (e.g. physicians and other health professionals) or worked on one unit but sometimes transferred to other units (e.g. nurses), aggregation to the unit level was not appropriate. Campus (i.e. Civic, General, Riverside, Rehabilitation Centre) was used.
as an aggregating variable in analysis, because the commitment that is needed to establish a patient safety climate is a site-level (i.e. campus) mandate [1]. A series of generalized estimating equation (GEE) models were generated to account for the clustering of responses by campus. Where there was no empirical justification, we added control variables that proposed relationships to any concepts in the model. Thus, age was included because of research demonstrating a positive relationship between age and work (including respect) [27]. We included gender because of a recent meta-analysis, which showed gender differences in conflict resolution skills [28]. Marital status and education were included because of research suggesting a relationship between these variables and work values [29]. Interaction terms (collaboration × conflict; respect × conflict) were entered into the models to test for moderation. Data analysis was conducted using the SAS software, Version 9.2, by SAS Institute, Inc. (Cary, NC, USA). All cases with missing values were deleted prior to analysis, and a P-value of ≤0.05 was considered significant.

Results

Of the 4055 surveys distributed to physicians, nurses and other health personnel at T1, 1896 surveys were returned for a 47% response rate. Overwhelmingly, respondents were female (81%) and married (72%). The age of respondents ranged from 17 to 76, with an average of 47 years. Thirty-seven percent of respondents had an associate degree or diploma, 28% a bachelor’s degree and 32% a graduate degree. Most respondents worked full-time (69%) with the remainder working part-time, casual or engaged in job sharing (30%). Respondents worked an average of 18 years in their current profession and 14 years at TOH. The vast majority of respondents were either registered nurses (n = 1116; 60%) or registered practical nurses (n = 96; 5%). Six resident and 306 attending physicians responded. Other health personnel included 7 audiologists, 17 pharmacists, 39 occupational therapists, 44 physiotherapists, 20 respiratory therapists, 34 dieticians, 66 social workers and 9 speech therapists.

Table 2 displays results of GEE analyses. Collaboration and respect were both independent, positive predictors of patient safety climate. Conflict was an independent and significant inverse predictor of patient safety climate but did not moderate the relationship between collaboration and patient safety climate or the relationship between respect and patient safety climate. Interestingly, being divorced (using ‘single’ as the reference marital status) was an independent, positive predictor of patient safety climate, with age trending toward significance. Profession (i.e. physician, nurse and other health professional) was not a significant predictor. The high Quasi-Akaike Information Criterion suggested poor model fit.

Discussion

Collaboration, respect and conflict were all independent predictors of patient safety climate, but conflict did not moderate relationships between collaboration and patient safety climate or between respect and patient safety climate. Mutual respect may be a determinant of collaboration [8, 30] and may contribute to a patient safety climate through collaboration indirectly as well as directly. In a literature review of determinants of collaboration, respect was conceptualized as a component of interpersonal relationships that was required for collaboration [8]. In a qualitative study in New Zealand exploring perceptions of collaboration among new junior physicians and newly graduated nurses, respect was viewed as a component of the quality of collaboration [30]. A qualitative study in Canada describing healthcare provider attitudes toward interdisciplinary collaboration in maternity care found that lack of respect was a relational barrier to the development of collaborative practice, suggesting that mutual respect is required for collaboration to develop [31]. Developing a fuller understanding of the relationship between respect and collaboration is important, because disrespect inhibits collaboration as well as compliance with practices that promote patient safety [17].

The inverse relationship between conflict and a patient safety climate is consistent with the literature [32, 33]. The finding that conflict did not moderate either the relationship between collaboration and patient safety climate or the relationship between respect and patient safety climate should be viewed in a positive light. That is, initiatives to foster collaboration and respect may move forward and even be facilitated by the presence of inter-professional conflict [34]. Conflict can be used as a source of learning and serve as an impetus for growth toward collaboration [34].

The professional boundaries, hierarchical differences and individualistic tendencies that often generate conflict can serve as opportunities to learn about others, by aligning team

Table 2 Results of GEE analysis

<table>
<thead>
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<th>Effect</th>
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<tr>
<td>Respect</td>
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<td>Collaboration ×</td>
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members with organizational goals. One possible intervention would be to develop a ‘learning’ organization, which is characterized by a constant cycle of transformation [34]. In such an organization, learning becomes a goal of the team’s work, facilitating collaboration, and is as important to team members as completing team tasks [34]. Another intervention would be to promote a strong organizational identity and citizenship behavior [35]. These are features of an organization’s social structure that can be built by developing self-managed teams, decentralized decision-making and compensation based on performance [36].

The finding of a significant relationship between divorced marital status and patient safety climate was unexpected and has not been previously reported. There is little agreement in the literature about the influence of demographic diversity on outcomes such as group performance and cohesion [37]. Research is needed to determine the value of various demographic variables and their relationships to specific outcomes (e.g. education and collaboration; marital status and respect) [37, 38].

There are several limitations to our study. We did not examine relationships across time periods, and cross-sectional analyses cannot infer causality. Despite the large sample size, all respondents were from one city in Ontario, Canada, limiting the generalizability of our findings. This was a secondary data analysis, and instruments more congruent with the concepts of interest may have yielded different results. Further detailed pre–post analyses incorporating qualitative components might be useful to better understand activities undertaken at the team level.

In summary, hospitals are complex healthcare organizations and their intricacy complicates efforts to build a climate for patient safety. Multiple professions must work collaboratively to ensure quality patient outcomes but often have to overcome disciplinary and hierarchical differences. Through the IPMPC, it has been possible for health professionals from all disciplines to embrace values such as respect and learn how to collaborate and build a patient safety climate, even in the presence of inter-professional conflict. The experience at TOH shows that relationships do matter.

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**References**


23. Anonymous. The Ottawa Hospital IPMPC [Internet]. [cited 2013 Sep 4]. http://www.ottawahospital.on.ca/wps/portal/Base/TheHospital/OurModelofCare/ProfessionalModels/InterProfessionalModelofPatientCare/txt/p/c5/rZDNUs1wFIWfbQcQ3NCbpFm2jm1Tmnmh_Q0iGAXW0Y1EZHf6c3jpaduQA3nrv85sw955CdlLdliHpq35Vez2y4_y1zuIFBFDGWPPEEHyRBGD4aKqdKEE7RPy7IDHBrRes97e9kijWenK0sLbP50ar45NTLuKxqV64LU0-z3aCj3dfM6e01hszZTQL-neoWD7tecL0kgsbdhJDJJaARGpdZ7zBlaw91kpK6WbXD3M7bCEwjoKCF7shCq9Mic1uOqPKFT_20RXFp-hxyTfHJCBoGQWdqV9qEsosadToUGGNIAHM_HBBAXmqfQejKDnqPFBkgfw6XASp-HCaKAmDPb25w-GKAiAu2bWvZN8eM.


