



Perceptions of interprofessional collaborative practice and patient/family satisfaction



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ABSTRACT

Interprofessional providers of healthcare services need to function effectively as a team to deliver patient-focused interventions that are safe, of high quality, and clinically effective to generate improved patient outcomes. An academic pediatric hospital conducted a descriptive, correlational study to (a) describe clinicians' perceptions of interprofessional (IP) collaboration and to (b) identify the relationship between Collaborative Practice Assessment Tool (CPAT) scores with selected items from the Press Ganey[®] (PG) patient satisfaction survey. The results of the study indicated a moderately high perception of IPCP (M = 5.51, SD = 0.75), with the highest perceptions noted in the domains of Patient Involvement (M = 6.18, SD = 0.95) and Decision Making (M = 4.53, SD 0.82). There was no relationship between average CPAT scores and responses on PG ($r = 0.009$, $p = 0.964$). Results of this study provide baseline data for future research and can be used to develop strategies that further enhance interprofessional collaborative team practices.

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Healthcare functions in a complex environment. Patients have multiple comorbidities and chronic conditions and technology is advancing at rates not previously envisioned. Interprofessional (IP) providers of healthcare services need to deliver innovative and patient-focused interventions that are safe, of high quality and clinically effective to generate improved outcomes.

For nearly two decades, the need for change within the United States Health Care delivery system has been well documented. Safer health care systems¹ necessitate interprofessional education,² and a redesign of health care systems.³ Undoubtedly, key elements to the successful redesign of health care delivery systems are interprofessional education (IPE) and interprofessional collaborative practice (IPCP). Health care can no longer afford to ignore the need to link IPE and IPCP with population-directed outcomes.^{4,5}

A critical foundation necessary for IPCP has been recognized as IPE.^{4,6,7} Interprofessional education has been defined as two or more students learning about, from, and with one another in order to enable effective collaboration and improved patient health outcomes.⁸ IPE positively impacts students' abilities to work collaboratively in clinical practice.^{9,10}

In a systematic review of the literature, Thistlethwaite summarized that interprofessional collaboration is encouraged and improves patient care, as a result of positive interactions occurring within IPE exchanges.⁹ In addition, IPCP contributes to patient care improvements, in partnership with families, while also meeting demands of the health care system.¹¹ Further, IPCP both as an intervention and an intermediate outcome, supports the Institute for Health Care (IHI) Improvement's Triple Aim (2016). The Triple Aim targets reduced health care costs per capita, improved overall health of populations, and an improved quality of and satisfaction with the overall patient care experiences.^{12,13} IPCP is envisioned to enable teams to meet goals that no one member could accomplish in isolation.¹⁴

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One collaborative model of care delivery that supports achievement of the Triple Aim is that of Family-Centered Care (FCC). Integration of key concepts from the FCC model, such as dignity and respect, information sharing, participation and also collaboration, enables a partnership approach to build on the inherent strengths of children and families.¹⁵ FCC, paired with interprofessional care delivery practices that also strive for mutual respect, may well positively impact care outcomes.¹⁶

Patient Centered Care (PCC), philosophically congruent to Family Centered Care, acknowledges and empowers families as partners in care delivery.¹⁷ PCC is also highlighted as one of the Institute of Medicine's six health care aims that attempt to ensure patient values assist in guiding all clinical decisions.³ FCC, practiced at the site of the research study, is a care delivery model that supports the Triple Aims of health care.

Integrated teams, with common goals and shared decision-making, are essential to effectively implement a FCC model in healthcare.¹⁸ Shared decision making is fundamental to enable IPCP. IPCP enables team members work collectively together and strive to deliver comprehensive primary health care, fully applying their knowledge and skills, in order to effectively meet the needs of a particular population.¹⁹ Additionally, in support of this shared decision-making concept, "interprofessional collaboration is the process of developing and maintaining effective interprofessional working relationships with learners, practitioners, patients, clients, families and communities to enable optimal health outcomes" (as cited in,⁹). The Family Centered Care model requires collaboration which is constructed upon this shared decision-making concept. It supports clinical practices where patients and families are integral and equal partners in care delivery practices.¹⁵ This approach enhances effective teamwork within healthcare arenas. Brandt asserts "the most successful health care systems are focusing on becoming learning organizations to implement teams of not only health professionals but also to meaningfully partner with patients, families, and communities" (as cited in,²⁰).

1. Interprofessional collaborative practice

With IPE as a foundation, IPCP improves the delivery of healthcare services and positively impacts patient outcomes.⁷ However, a comprehensive review of multiple studies calls for more rigorous research studies to specifically examine these IP collaborative practices. There is a clear need to link the impact of practice-based IPC interventions to subsequent healthcare outcomes (as cited in,²¹). In 2014, Brandt, Lutfiyya, King, and Chioreso presented a scoping review of the IPP and IPE literature, assessing the status of research studies connecting interprofessional education and interprofessional practices towards the development of the Triple Aims of effective, quality patient care delivered with positive patient outcome experiences. They concluded that the impacts of IPE, and also IPP on patient care have not yet been demonstrated through clinical research.

2. Interprofessional collaborative practice and family satisfaction outcomes

Outcome measurements related to IPCP have been scarcely reported scarcely in the scholarly literature. The recently published report, *Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes*, included an examination of studies attempting to specifically correlate the impact of IPE with patient and population outcomes. This comprehensive report noted less than a handful of studies reported results striving to clearly relate IPCP to patient and/or family communications ($n = 2$) and/or outcomes ($n = 1$), while the majority of reviewed works

focused on processes related to practices within the organization overall.⁴ The challenges in concluding the associations within these relationships, in part appear to be due to the complex nature of the overall healthcare environment, with many factors simultaneously influencing actual practices, perceptions and final outcomes. Few studies have been published that examine this complex issue.

Specifically, one study by Shaw, Davidson, Smilde, Sondooza and Agan,²² examined family satisfaction in the intensive care unit (ICU). Ninety-eight interprofessionals were educated in patient communication techniques. Family satisfaction scores improved post clinician education. This study did not focus on team collaboration specifically, but education on individual clinician's communication with patients and families. Fifteen years earlier, a randomized control trial focused similarly on education related to patient communication techniques. However, while clinicians reported a moderate improvement in their communication skills, in this study patient satisfaction scores did not improve as a result of the training of the clinicians.²³ In addition, well over two decades ago, it was noted that IP collaboration, specifically between RNs and MDs, decreased the amount of negative patient outcomes related to patient transfer status.²⁴

A common indicator used to measure quality of healthcare is patient/family satisfaction.²⁵ Patient satisfaction has been referred to as a critical outcome indicator.²⁶ As noted, above, there are minimal studies that explored the impact of IPCP with the outcome of family satisfaction. These limited studies clearly conclude conflicting results. No study specifically explored the relationship between perceptions of collaborative practices, using a valid and reliable tool, and the outcome of patient and family satisfaction. This research study attempts to bridge the gap in the literature and to establish baseline data for future investigation.

The study was undertaken to discover relationships between IPCP and patient/family satisfaction outcomes. The specific purposes of this study were to gain an understanding of clinicians' perceptions of the level of collaboration between disciplines on individual units and to identify the relationship between scores on an IPCP assessment and scores on patient/family satisfaction quality survey. Study results will also lead to development of future strategies targeted to improving collaboration among clinicians, removing barriers to collaborative practice, and improving the quality of care delivery and ultimately patient outcomes. The specific research questions addressed were:

- What are the perceptions and the degree to which interprofessional team members collaborate with one another to provide comprehensive, timely, and appropriate care?
- Is there a correlation between the average scores on Collaborative Practice Assessment (CPAT) and the average patient/family satisfaction scores?

3. Methods

3.1. Design

Researchers from a pediatric hospital collaborated with researchers from a local university to conduct a prospective, descriptive, mixed-methods research study. The purpose of the study was to gain an understanding of clinicians' perceptions of the level of teamwork and collaboration between interprofessionals on patient care units and to identify any relationships between interprofessional collaborative practices and patient/family satisfaction quality outcomes. The study was deemed exempt after reviews by the affiliated practice and academic Institutional Review Boards. Ethical Considerations for the protection of human subjects and the

consent to participate were addressed through the privacy of recruitment emails; an introductory script explaining the study including the option to withdraw; and the collection of confidential information on the survey. Consent to participate was acknowledged by a subject's willingness to complete the survey, after reading the introductory script and then accessing the secure link to begin the survey. Although no identifiers were collected on the CPAT survey, there was minimal risk of researchers knowing the identity of a subject from survey responses matched with specific demographic data. Subjects were notified of this minimal risk in the introductory script.

3.2. Setting

A free-standing, urban, pediatric, tertiary care, academic medical center in the Mideast served as the setting for the study. The research facility is a Level 1 Trauma Center with 315 total licensed beds, including 103 critical care beds (55 beds neonatal intensive care, 36 beds pediatric intensive care, and 12 beds cardiac intensive care). The medical center routinely serves neonates, infants and children up to 18 years of age. The average yearly volume of patients includes: over 20,000 combined inpatient and observation stays; roughly 80,000 Emergency Department visits; approximately 23,500 surgical procedures; and more than 1,000,000 outpatient visits. Specialty services are offered to children undergoing organ transplantation, cardiovascular surgery, oncology treatment regimes, and gastroenterology procedures to name a few. As noted, the model for patient care delivery is one of Family Centered Care.¹⁵ Several patient and family-centered initiatives have previously been implemented using an interprofessional collaborative practice approach, such as routine bedside rounding and patient care conferences that enhance shared decision-making practices as well.

3.3. Participants and recruitment

A convenience sample of clinical staff was recruited to participate in a one-time voluntary survey. Clinical staff defined as interprofessional care providers, were those having a direct impact on the clinical care of the pediatric patients. These interprofessional individuals included staff in the roles of nurses, nurse practitioners, patient care technicians, pediatric medical/surgical residents, fellows and attending physicians, pharmacists, occupational therapist, physical therapists, social workers, child life specialists, respiratory therapists, and also care coordinators.

Potential subjects were identified by leadership across 16 different patient care areas throughout the hospital. These areas were clustered into four unit categories; medical, medical-surgical, intensive care, and surgical/perioperative. Units were clustered according to common standards and processes for patient care flow need within hospitals across the nation. The four units were clustered according to types of patients serviced, level of care needed and types of providers required to deliver the necessary care. This clustering offers a common language and will assist with future comparison studies. Subjects were invited, and reminded twice, to participate in the survey through an introductory script delivered via email. These emails, offering study participation, were sent at three different time points within the 30 days of data collection.

3.4. Data collection

Study data collected included the survey Likert items and three open-ended questions, as well as selected items from a patient/family satisfaction tool. Study data were collected and managed using REDCap (Research Electronic Data Capture), which is a secure,

web-based application designed to support and manage data capture for research studies.²⁷ Potential subjects were provided a direct link to the survey within the email introductory script. The survey remained open for 30 days to obtain maximum number of subject responses.

3.5. Survey tools

The Collaborative Practice Assessment Tool (CPAT) was developed to collect background information about collaborative practices that assess the degree of provision of comprehensive, timely, and appropriate patient care.¹¹ The CPAT is a 56 item, seven-point Likert scale type survey tool, measuring clinicians' perceptions of teamwork and collaborative practice. It was used with permission from Queen's University Ontario and reproduced electronically for ease of survey distribution, data collection, and subsequent analysis. Possible responses on the Likert scale range from strongly disagree to strongly agree. The 56 Likert items are further categorized across eight domains of collaborative practice including: mission, meaningful purpose, goals; general relationships; team leadership; general role responsibilities, autonomy; communications and information exchange; community linkages and coordination of care; decision-making and conflict management; and patient involvement.¹¹

Reliability and validity testing of the CPAT were reported by the researchers through two separate pilot tests.¹¹ Follow-up confirmatory analysis revealed a Normed Fix Index (NFI) with a range of 0.901–0.970, a Comparative Fix Index (CFI) with a range of 0.943–0.986, and a Tucker Lewis Index with ranges from 0.851 to 0.973. For each of the above mentioned statistics, a score of 1.0 would indicate a perfect fit, and anything above 0.90 is considered acceptable. These comprehensive analyses indicate the CPAT provides a "good measure of collaborative practice".¹¹ Only one research study using this CPAT tool has been published thus far.⁶

3.6. CPAT background and open-ended questions

Subjects provided additional background information that included gender, profession, years working in the profession, and which unit of the hospital they work most of the time. Some clinicians work on multiple units across the hospital and were directed to select the unit worked on most of the time in order to complete the tool. Individual units of the hospital were clustered to align with the unit type, using national benchmark classifications for the purposes of future analysis and data comparisons.

The third set of data collected with the CPAT were the open-ended questions related to collaboration and collaborative practices that were included at the end of the survey. The three questions were: (a) What does your team do well with regards to collaborative practice? (b) In your practice what are the most difficult challenges to collaboration? (c) What does your team need help with to improve collaborative practice?

3.7. Patient satisfaction survey

The Press Ganey[®] Inpatient Pediatric Survey was used to determine parental satisfaction with overall hospitalization experience.²⁸ The outcome of satisfaction was measured by selected items from the Press Ganey[®] (PG) survey tool. The PG survey is typically sent electronically to parents/families of all patients discharged from the hospital, with the allotment of one survey every 90 days. The tool is used to measure standards of care related to patient experiences at the research facility. Satisfaction scores are reported anonymously and clustered for reporting into aggregate means measured on a five-point Likert scale, with responses

ranging from very poor to very good.

The research team selected two questions from the PG survey that would potentially be directly impacted through interprofessional collaborative practices. The PG tool is known to be a reasonable and valid measure of patient/family satisfaction outcomes. The two PG questions selected were “staff efforts to include you in decisions about your child’s treatment” and “how well staff worked together to care for your child” and.²⁸ The satisfaction scores were collected from the quarter corresponding with CPAT administration and included responses from all of the hospital unit clusters represented in the research study.

3.8. Data analysis design

Quantitative and qualitative data analyses were performed on the research data. Analysis of the descriptive and open-ended CPAT survey tool data, as well as correlation with Press Ganey[®] satisfaction responses from two questions were completed. Survey tool results were entered into the REDCap system then downloaded into an Excel database. Measures of central tendency (mean) and dispersion (standard deviation, range) were used to describe continuous characteristics. ANOVA was used to compare the means of the clusters of units for each domain of the CPAT and the Bonferroni adjustment for multiple comparisons was made. The primary goal of the correlations was to assess the association between each of the Press Ganey[®] questions and the CPAT data. A Spearman correlation coefficient was used to assess the association between the average overall CPAT (across all items) score for each individual unit and the corresponding unit’s average score for each of the Press Ganey[®] questions.

Qualitative analysis of the open-ended questions was done using thematic text analysis. This is a descriptive qualitative approach involving the generation of codes and then developing overarching themes from the participant responses.

4. Results

4.1. Quantitative findings

4.1.1. Demographic data

A total of 1358 clinicians were identified by leadership for potential recruitment into the study. There were 173 subjects that participated in the study, yielding an overall response rate of 13%, which is below what researchers anticipated. The responses of each profession roughly approximated the target sample, however there was slight underrepresentation for the MD and a slight overrepresentation of the RN group. Again, units were clustered based on national benchmark groupings. This unit type of clustering was reflective of units similar in specialty patient population types, teamwork, and processes. It also provides the best data sets for this specific study results and analysis, as well as the potential for external comparisons. Interprofessionals viewed themselves as “team” members from one chosen unit to answer the survey. Sample characteristics are outlined in [Table 1](#).

4.1.2. Results of CPAT

Analysis of individual CPAT scores revealed a mean score of 5.51 (SD = 0.75), on the seven-point Likert scale. This finding supports a high degree of interprofessional collaborative team practices among direct patient care providers across the hospital. Subject demographics such as age, education, etc. were not found to significantly impact the overall CPAT scores. However, the group with over 10 years’ experience up to 20 years’ experience had the highest mean CPAT score at 5.78 (SD = 0.59). Mean scores from all subjects were described according to the eight domains (see

[Table 2](#)). The domain of Patient Involvement had the highest mean at 6.18 (SD = 0.95), and the domain of Decision Making and Conflict Management had the lowest mean of 4.53 (SD = 0.82).

Overall CPAT scores were further clustered by unit categories as previously described. Mean unit type scores of the clustered units were reported as: Surgical/Perioperative (M = 5.56, SD = 0.69); ICU (M = 5.53, SD = 0.70); Medical/Surgical (M = 5.52, SD = 0.88); and Medical (M = 5.53, SD = 0.61). There was no statistically significant difference between the clustered units in overall CPAT scores ($p = 0.7605$). Additionally, clustered unit type domain scores were analyzed to highlight overall perceptions, areas of strength in collaborative practices, as well as opportunities to impact barriers perceived by interprofessional team members. Statistical significance was not detected across the unit type groupings, in any of the eight domains. Mean domain scores revealed Decision Making had the lowest mean across three of the four unit types; and Patient Involvement had the highest mean in three of four unit types (see [Table 2](#)).

Lastly, an analysis was completed to determine if members of various professions perceive interprofessional collaborative teamwork differently. [Table 3](#) outlines these results. There was an overall borderline significant difference between professions with a p -value of 0.057. However, there were no pairwise significant differences due to the Bonferroni multiple comparison correction. Clinical care coordinators scored the highest of any interprofessional group. Unfortunately, no OT, PT or pharmacy interprofessionals are represented in the research sample.

4.1.3. Association of CPAT with Press Ganey[®] scores

Patient/parent satisfaction scores from Press Ganey[®] were computed from a total of 312 survey respondents. Scores for the questions “staff efforts to include you in decisions about your child’s treatment” and “how well staff worked together to care for your child” were calculated. The PG raw scores were on a Likert scale from one to five and were converted to a scale of zero to 100 as directed by PG staff.²⁹ Responses ranged from very poor to very good on the tool: 1 = 0% very poor, 2 = 25% poor, 3 = 50% fair, 4 = 75% good, and 5 = 100% very good). See [Table 4](#). A spearman correlation coefficient of average CPAT scores across a unit to the

Table 1
Participant characteristics.

| Total participants | 173 |
|----------------------------|--------------|
| <i>Gender</i> | |
| Male | 20 (11.56%) |
| Female | 151 (87.28%) |
| Not identified | 2 (1.12%) |
| <i>Years of Experience</i> | |
| Up to 3 years | 49 (28.3%) |
| Over 3 - up to 4 years | 60 (34.7%) |
| Over 10 - up to 20 years | 35 (20.2%) |
| Over 20 years | 25 (14.5%) |
| <i>Profession</i> | |
| Registered Nurse | 113 (65.3%) |
| Physician Resident | 7 (4.0%) |
| Physician Attending/Fellow | 15 (8.7%) |
| Patient Care Technician | 12 (6.9%) |
| Social Worker | 3 (1.7%) |
| Child Life Specialist | 2 (1.2%) |
| Respiratory Therapist | 3 (1.7%) |
| Clinical Care Coordinator | 3 (1.7%) |
| Other | 15 (8.7%) |
| Medical | 17 (9.83%) |
| Medical - Surgical | 54 (31.21%) |
| Surgical - Perioperative | 31 (17.92%) |
| Intensive Care Unit | 70 (40.46%) |
| Did not indicate | 1 (0.5%) |

average Press Ganey[®] scores across the corresponding unit showed no significant correlation for the areas of inclusion about decisions ($r = 0.009$, $p = 0.964$) and working together as a team ($r = 0.230$, $p = 0.516$).

4.2. Qualitative findings

Using thematic text analysis, data from the open-ended questions were entered into Atlas.ti (vers. 6.2.28). Initially, codes were generated from the respondents' words. Major categories of communication, process and values were predominant in initial coding. In continued analysis meaningful themes were generated using participant wording. Frequency and co-occurrence of themes were evaluated.

Question 57. The first question asked the participants to identify what they do well in regards to collaborative practice. Responses were broken into categories of communication, process or values.

Communication. Several respondents indicated "some work well together." A theme of inconsistency was identified supported by the following comments: "some better than others;" "some doctors better than others;" "depends on the shift;" or "depends on the attending." However, during emergency or critical situations, collaboration occurred consistently as supported by the following comments, "Everyone always pulls together" and "everyone understands their role and executes their tasks."

Process. Twenty-five responses could be coded as process related. Most were positive, expressing that their team had developed successful processes. The theme identified under the process category was collaboration as demonstrated by rounding, huddles or team meetings. Rounding was mentioned most often ($n = 12$) in this question relating to successful practices.

Values. The third category was that of values. The primary theme was respect. Specifically mentioned was "respect for the bedside nurse" and "respectfully abiding by care plan even if disagreements." Another theme was team cooperation toward a shared goal.

Question 58. Question 58 asked the respondent to detail the most difficult challenges to collaboration. There were 71 responses to this question recorded. Categories of communication, process and values were evident here also, but from the perspective of what is not working.

Communication. When asked to identify the challenges to collaboration, themes identified included not listening and rudeness. "Some of the doctors not listening to our concerns and being rude." The relationship between novice nurses and some nurse practitioners was preserved as being intimidating and hindering communication at times.

Processes. Respondents described processes that didn't function effectively due to the many services involved and the constant change in care. One respondent stated, "Having everyone on the same page pretty much sums it up." Decisions are made in one service and not communicated to others.

Values. Lack of respect was a theme. Many clinicians perceive a distrust of novice nurses. Novices perceive being excluded from decisions and increased anxiety to call physicians. The need for mentoring of novice nurses was also identified.

Question 59. What does your team need help with to improve collaborative practice? Thirty-one respondents answered this question. The categories included education and process.

Education. Requests were made for education related to professionalism, listening, communicating with patient's families as well as using the courses already available at their institution on quality.

Process. Many suggestions were made for improving team processes. Suggestions included utilizing Ipads for access to data by bedside nurses, more formal rounds including family, and use of an existing QI program.

One staff expressed thanks that their input was solicited to improve the collaborative atmosphere on their unit. The qualitative responses reflected similar themes throughout the three questions with an overwhelming desire for a respectful, positive work environment. The suggestions to create the environment are not costly, but require a culture change.

5. Discussion

To improve collaborative practice among healthcare providers in the acute care setting, the insights of clinicians regarding themselves as a team, must first be explored. This research study provides baseline of perceptions of IPCP, which has not been previously described in the literature. Despite the inability to demonstrate statistical significance, this research project was able to: identify perceptions of the concepts of team and collaborative practices of interprofessionals working on various units; and to identify specific dimensions of collaborative practices within the eight domains of the CPAT tool.

Researchers identified across all levels of acute care, interprofessionals perceived a moderately high level of IPCP with a mean score across all participants of 5.51 on the 7-point Likert scale. This finding indicates overall interprofessional team collaborative practices are present within the research hospital. The qualitative analysis of data indicates strong relationships on units leading to the sharing of a common vision, a critical skill for quality care delivery. Processes such as rounding, huddles and team meetings, when successfully carried out positively impacted team members' sense of collaborative practice. This finding aligns with Earnest & Brandt,¹⁴ who suggest that IPCP teams can meet goals more effectively than when attempting to accomplish goals individually. Although it is encouraging to discover the positive identification of IPCPs, further exploration of the composition and characteristics of individuals within interprofessional teams may be warranted, including fluidity of membership on the team. Typical levels of teamwork at this institution are also valuable for future comparisons at this and other institutions.

Table 2
Mean scores of CPAT by overall hospital and unit types.

| Domain | Overall | ICUs | Medical/-Surgical | Medical | Surgical/Perioperative |
|--|------------------|------------------|-------------------|------------------|------------------------|
| Mission, Meaningful Purpose, Goals | 5.84 (SD = 0.81) | 5.81 (SD = 0.81) | 5.84 (SD = 0.99) | 5.76 (SD = 0.66) | 5.96 (SD = 0.56) |
| General Relationships | 5.93 (SD = 0.89) | 5.87 (SD = 0.89) | 5.88 (SD = 1.04) | 5.97 (SD = 0.57) | 6.09 (SD = 0.78) |
| Team Leadership | 5.48 (SD = 0.89) | 5.41 (SD = 0.84) | 5.60 (SD = 0.87) | 5.15 (SD = 1.05) | 5.65 (SD = 0.95) |
| General Role Responsibilities, Autonomy | 5.41 (SD = 0.76) | 5.42 (SD = 0.80) | 5.52 (SD = 0.64) | 5.17 (SD = 0.69) | 5.34 (SD = 0.87) |
| Communication & Information Exchange | 5.59 (SD = 0.89) | 5.64 (SD = 0.83) | 5.69 (SD = 0.85) | 5.10 (SD = 1.00) | 5.56 (SD = 1.01) |
| Community Linkages & Coordination of Care ^a | 4.85 (SD = 1.25) | 4.92 (SD = 1.14) | 5.01 (SD = 1.24) | 4.10 (SD = 1.26) | 4.80 (SD = 1.42) |
| Decision Making & Conflict Management | 4.53 (SD = 0.82) | 4.6 (SD = 0.82) | 4.42 (SD = 0.85) | 4.54 (SD = 0.83) | 4.52 (SD = 0.78) |
| Patient Involvement | 6.18 (SD = 0.95) | 6.20 (SD = 0.97) | 6.35 (SD = 0.69) | 6.14 (SD = 0.79) | 5.87 (SD = 1.30) |

^a One domain item inadvertently omitted on electronic survey tool.

Table 3
Mean scores of CPAT by interprofessional team members.^a

| Profession | Number of participants | Mean | Standard Deviation |
|-------------------------------|------------------------|------|--------------------|
| Clinical Care Coordinator | 3 | 6.09 | 0.18 |
| Other | 15 | 5.96 | 0.59 |
| Patient Care Technician (PCT) | 12 | 5.75 | 0.76 |
| Physician Attending | 15 | 5.70 | 0.76 |
| Social Worker | 3 | 5.65 | 0.40 |
| Respiratory Therapist | 3 | 5.63 | 0.42 |
| Registered Nurse | 113 | 5.42 | 0.70 |
| Child Life Specialist | 2 | 5.26 | 0.47 |
| Physician Resident | 7 | 5.00 | 1.43 |

^a Borderline significance with a p-value = 0.057.

Examining mean CPAT scores across professions revealed an overall borderline significance with a p-value of 0.057, however no pairwise significant differences were noted. Researchers were not surprised to learn that among the different professions the clinical care coordinators mean composite score was highest overall at 6.09 (SD = 0.18). It is reasonable to conclude that given their job description, this was not unanticipated as their work routinely involves multiple interprofessional team members in coordinating the discharge plan. Patient care technicians (PCT) scored third highest with an overall CPAT score of 5.75 (SD = 0.76). The dyad mode of operation is intrinsic within daily functioning in the life of a PCT is the Registered Nurse (RN) and PCT. In the dyad, the RN routinely and consistently delegates tasks to the PCT throughout the day. The constant exchange of information requires a team approach to effectively care for the patient and could explain the high score of the PCTs' perception of team work on the CPAT tool.

Further examination of each domain within the CPAT tool can help providers to narrow clinicians' perceptions of IPCP and to identify specific areas of high and low perceived IPCP. These perceptions offer a foundation for the development of strategies aimed at improving overall IPCP or support for continued effective collaboration processes. Regarding the overall CPAT scores, there was no statistically significant difference between domains. With a hospital-wide mean (M = 6.18), staff agreed to the concept of teamwork within the domain of patient involvement. Additionally, this domain was the highest scoring domain in three of four unit clusters. The CPAT scores ranked highest related to patient involvement. This domain had the highest overall mean score and reinforces the foundational model of Family Centered Care and shared decision making practices enacted at the research institution.

The two domains of General Relationships and Mission, Meaningful Purpose and Goals were also ranked very highly as noted previously (5.93 and 5.84 respectively). In the qualitative data analysis, some professionals mentioned their team was welcoming and sought input from all team members. These types of teams may serve as models for team education and repurposing. These study findings are consistent with Nancarrow et al.'s assertions that characteristic principles of good interdisciplinary teamwork include, "positive leadership and management attributes; communication strategies and structures; personal rewards, training and development; appropriate resources and procedures; appropriate skill mix; supportive team climate; individual

characteristics that support interdisciplinary team work; clarity of vision; quality and outcomes of care; and respecting and understanding roles" (2013, p 1).³⁰

In contrast, the Decision Making and Conflict Management domain scored the lowest, across the hospital and again in three of four unit types with a mean score of 4.53. Consistent with the recommended usage of the CPAT tool, this appears to be an identified professional development need and the team may potentially be impacted by educational interventions. Paired with qualitative results, that indicated although there was an overall call for an atmosphere of respect, newer staff particularly is often intimidated, especially by nurse practitioners and physicians. Thus, this particular finding has implications as an identified barrier to collaborative team practices. Improvement in managing conflict is an essential step to developing shared decision making in a team, a critical aspect of successful collaboration.¹⁸ The Brinkert³¹ review of healthcare literature on conflict communication, finds this issue to be pervasive in acute care and costly due to burnout, turnover and absenteeism. Potential interventions identified as successful in the literature include enhanced communication mechanisms,³² preceptorship programs³³ and problem-based learning strategies.³⁴

The clustered units scores ranged from a high of 5.56 (Surgery/ Perioperative) to a low score of 5.33 (Medical). Although no direct statistical correlations were able to be made between CPAT and PG scores, it is noteworthy that the surgery/perioperative cluster also had the highest PG scores. This relationship is worth exploring in future investigations in order to further build on the strengths of these teams and to develop strategies for application in other areas.

This study also looked for a relationship between clustered units' CPAT scores and two questions selected from the respected Press Ganey[®] survey, that in the opinion of the research team, are associated with teamwork and collaboration. As was noted, although a positive correlation was anticipated, no relationship was uncovered. It is possible that the PG question identified to measure outcomes are more global in nature and are not specific enough to measure the impact IPCP. This broader relationship between patient/family outcomes and team collaborative functioning is notably outlined in the *Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes* (2015). The document puts forth discussions of the difficulty of this challenge to correlate linkage in a well-defined manner, due to the complexities and intricacies within care environments impacting outcome measures.

Table 4
Mean scores of press Ganey[®] by overall hospital and unit type.

| | Overall Hospital N = 312 | Medical N = 71 | Medical-Surgical N = 138 | ICUs N = 6 | Surgical-Perioperative N = 96 |
|--|-----------------------------|-------------------|-----------------------------|---------------|----------------------------------|
| Staff efforts to include you in decisions about your child's treatment | 89.13 | 85.56 | 89.96 | 60 | 91.46 |
| How well staff worked together to care for your child | 91.69 | 89.08 | 91.85 | 83.3 | 93.49 |

Identified benchmark levels of interprofessional collaborative practices, as well as key domain IPCP scores, were established. However, the lack of correlation between IPCP and patient outcomes in this study is consistent with the significant gap identified across all health care professions that highlights the need to develop a framework to measure the impact of IPE on collaborative practice and patient outcomes.³⁵

6. Limitations

The lack of paired data complicated the association calculations were identified as a limitation. The need to treat the unit clusters as individual data points for the correlation analysis, lead to the small number of pairings. Thus, the small number of data points available for analysis, created by the clustering of units by specialty patient population types, teamwork, and processes may have been a factor in the lack of correlation between CPAT scores and outcomes.

The ICU cluster reported an extremely low number of responses, as children are not routinely discharged from the ICU units. This very small N (6) may contribute to skewed results on the overall Press Ganey[®] for this unit cluster and no generalizations are able to be made about this specific data. Reporting on the Press Ganey[®] survey also depends on parental memory of events and is not completed in real time of care delivery, potentially altering reported results.

Some elements of the research study design could be strengthened. The smaller sample sizes for both tools is recognized and generalizability of the findings should be done with caution. The sample distribution was roughly representative of the institution as a whole. However, all participants in the sample were interprofessionals working in a pediatric facility and this collective voice may actually be strength of the study.

7. Implications and recommendations

The goal of the study was to identify the current status of collaborative practice at the site through identifying the insights of clinicians. Clinician responses to the survey and open-ended questions lay the groundwork for creating an effective model of IPCP and education that fits the culture of the institution. Areas of strength, and those calling for development to increase the collaboration were identified in eight different domains. Strengths can be built upon, and areas of weakness used as a foundation for team learning.

The study also has implications for the institution's leadership awareness and development. Professional and institutional accrediting standards recently began including interprofessional collaborative practice requirements.³⁶ Very different from quality improvement of clinical issues, these standards require changing individual communication styles as well as the overall culture of the institution. The study tool allowed the state of the communication culture to be identified in an in-depth way.

The study presents a piece of the puzzle of identifying outcomes of IPCP on patient and family satisfaction and quality clinical care. The question of correlation between the average scores on the CPAT and the average patient/family satisfaction scores revealed no direct correlation. This can however be the groundwork for future studies further exploring relationships between collaborative practices and patient and family satisfaction.

Combining knowledge gained from the CPAT results with the latest effective pedagogical strategies will lead to development of a model of practice and education that will move the institution towards improved team collaboration. Models using the Communities of Practice model^{37,38} provide an interesting framework. At a recent leadership summit, Graham McMahon, President of the

Accreditation Council for Continuing Medical Education, noted the many benefits of a community of practice where open reflection and sharing on issues can occur.³⁹ Johns Hopkins Hospitals has developed clinical communities as a bottom-up approach to quality improvement that supports peer learning and develops shared norms.⁴⁰ Communities of Practice create the collaborative approach within the learning process, modeling collaboration as it is learned. These models stimulate collaboration within their structure.

Clearly, expansion of the current team structure to other interprofessionals included in the discussions, to begin to develop interventions, is warranted and key to consensus building and crafting a strategic plan to successfully move forward. An option may be to select members with particular years' experience (10–20 years), as they have the most optimal communication interactions with interprofessional team members. Engaging family members and patients to assist in redesign of structures and processes of care delivery is ideal. The use of daily interdisciplinary rounds and care conferences increases the involvement of multiple practitioners. Transition from historically medical-led to nurse-led bedside rounds is also an option to consider, that may enable visible plans of care to all interprofessionals and patients/families alike, strengthening the common vision for collaborative practices and shared decision-making.

Effective teams have a clear purpose, mechanism for conflict resolution and places patients at the center of practice that enables improved patient care and enhanced patient safety.⁴¹ Thus, consideration of a process change to a hospital wide shared governance model – not merely nursing shared governance – may well impact the decision making and conflict management domain rated lowest overall. Systematic structure and process initiatives, including education for effective decision-making and conflict management, are essential for strengthened effective interprofessional practice. Coalitions sharing experiences with other pediatric centers may identify best practices and curricula for this specific type of practice.

Recommendations for future research include specific dyad pairing of IP team members with the patient and family dyad within research institutions. This process would omit some convolutions and contributing variables for a stronger data analysis that could include a paired *t*-test and a more classical correlation analysis. A Power Analysis, to determine the sample size necessary to potentially uncover even a small effect size, may be warranted. However, a few confounding variables would remain, due to the complex nature of the overall environment and the complexity of teamwork. In the future it may be appropriate to ask IP clinicians if they have had formal IPE when surveying with CPAT, as this correlation would further strengthen the link between IPE and IPCP, the very foundation necessary for improved patient outcomes.

8. Conclusion

Practicing health care collaboratively is vital to improving patient care outcomes. This study adds to the limited research literature on collaborative practice in the acute care setting by examining the perceptions of healthcare providers' sense of teamwork. It may serve as a baseline for future studies to build a body of evidence for effective team collaboration. Research documenting the effectiveness of team-based care impacting the Triple Aims identified by the IOM, guides evidence-based approaches to collaboration. Use of the results of this study can add to the collective foundation being laid that will truly influence outcomes, so that “a century hence, this moment will clearly stand out as one ripe with both need and opportunity”,¹⁴ p. 500).

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