Interprofessional Case Conference Enhances Group Learning and the Quality, Safety, Value, and Equity of Team-Based Care

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Introduction: Patients seeking treatment for complex conditions require coordinated care from interprofessional clinicians. Collaborative engagement in an interprofessional community of practice is crucial to the collective competence of a team and the provision of high-quality, safe health care leading to improved patient outcomes. The objective of this descriptive, cross-sectional study was to describe interprofessional communication, coordination, and collaboration of participants in an integrated practice unit that was structured to include weekly case conferences as part of routine practice.

Methods: Data were collected from October 2019 to February 2020. Web-based surveys were administered to a convenience sample that included 33 questions and followed the CHERRIES checklist for reporting results. Items focused on team knowledge, impact on patient care, and communication, and conference focus and effectiveness. Descriptive and survey item analysis included frequency, percentage, means and standard deviation, Chi-square, and Pearson correlation analysis. Patient outcome data were collected via a Patient Global Impression of Improvement scale and were analyzed using a paired sample *t* test.

Results: Survey respondents (n = 161) included clinicians and administrative staff. Results demonstrated that interprofessional case conferences improved the collective competence of the team, including team knowledge and communication. Participants viewed case conferences as a means to enhance care delivery quality, value, safety, and equity. In the study period, there was also a statistically significant improvement between the patient's first follow-up and last visits.

Conclusion: Survey respondents indicated that case conferences were an effective means to deliver high-quality, patient-centered care through interprofessional collaboration and education.

Keywords interprofessional collaboration, team-based care, integrated practice unit, collective competence, community of practice, patient-centered care, patient-reported outcomes, high-value care

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A collaborative, team-based approach is crucial to the provision of high-quality, safe health care.[1–4] Patients seeking treatment for complex conditions require coordinated care from a variety of interprofessional clinicians. Interprofessional collaboration (IPC) exists when clinicians from multiple specialties and health professions competently work together to optimize their response to the needs of their patients.

The expertise of an assembled group of individuals does not alone translate to effective IPC within a health care team. As Lingard[1] suggests, "*competent individuals can form incompetent teams* because teamwork is more than the sum of the parts." To safely deliver high-quality care, collective competence of the health care team is necessary.[5] Collective competence requires teams to develop shared knowledge, undergo mutual experiences, and engage socially while balancing this interdependence with individual expertise and autonomy.[1,3] Hospital and clinical organizations should promote collective competence and integrate IPC into their operations to enhance quality and properly address ongoing health care demands.[6–9]

There are several factors leading to successful IPC within an organization. Among these are (1) common goals; (2) clear roles; (3) mutual trust; and (4) team resilience.[2–4,6,7,10] Barriers include power differentials and poor communication among team members. Physicians traditionally enjoy preeminent social status on an interprofessional team, with highly-sought opinions related to the perception of their unmatched technical expertise.[2,11] Conversely, the expertise and opinions of other health professionals are often held in lower esteem and overridden by their physician counterparts.[2,11,12] As a result, nurses and other clinicians may deploy avoidance strategies designed to limit interactions or bypass physicians.[2,11,13] This power structure inhibits the contribution of individual expertise and prevents open communication, which is well-known to interfere with collective competence and diminish the quality of patient care.[1,6,11,14–19]

To breach the power structure, overcome barriers to care, and engage in IPC, competent teams ideally establish a community of practice (CoP). A CoP is an assembled group of individuals within a network who share interests or values, and

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who further connect through collaborative learning.[20–22] CoPs in medicine are constructed around common goals and in an environment that facilitates learning and practicing together. CoPs have the potential to (1) close gaps in individual knowledge; (2) triage and resolve patient care problems; (3) reflect on patient outcomes and; (4) develop a shared mental model of clinical practice while engaging in social learning.[20,23] Interprofessional CoPs have demonstrated cohesive decision-making and problem solving, and the attainment and application of collective knowledge through interprofessional education (IPE).[4,21]

Structured, continuing IPE is one mechanism that allows team members to engage with one another in a social learning environment to enhance the care they provide[8] and "train as a workforce that is better prepared to respond to local health needs."[9] Common primary aims of interprofessional case conferences are to develop treatment plans, advance knowledge, and improve patient outcomes.[24,25] Important secondary objectives can include enhancing teaming skills of the participants when case conferences are structured to also serve as an IPE intervention designed to improve IPC.[10,24–32] There is little evidence in the peer-reviewed literature that describes the potential role of case conferences as interprofessional CoPs to facilitate team development, including addressing common power differentials.

In this article, we describe interprofessional case conferences that were created in part to counteract the power differential, thus improving communication and actively engaging health professionals in IPC and IPE. We also describe the results of our exploratory, longitudinal survey research that was conducted to study the collective competence of the health care team within an integrated practice unit (IPU) that included weekly case conferences as part of routine practice.

METHODS

In 2017, our academic institution opened a new clinic designed to modernize the delivery of high-value care. The IPU, is a multispecialty, IPC model created to mitigate the fragmentation, complexity, and inefficiency that patients often experience when seeking care.[33] It includes health care clinicians with specialized training in minimally invasive gynecologic surgery, urogynecology, and clinical focus areas within general obstetrics and gynecology such as vulvar disorders and chronic pelvic pain. Dermatologists, psychiatrists, physician assistants, nurse practitioners, licensed clinical social workers, registered nurses, pelvic floor physical therapists, dieticians, and medical assistants round out the team. To achieve higher value for the patient, each IPU clinic session is operationalized around a condition and evidence-based care pathways are followed to standardize practice (Table 1).

Team Outcomes

The IPU's structure challenges existing conventions in that the entire team is responsible for contributing to the health and care of each patient. In other words, the physician is not the primary leader, but rather a team member with a specific role and responsibilities. This core egalitarian principle provides a foundation for a CoP in team-based IPC and IPE. The team is expected to collaborate to address, analyze, and improve the care pathways, objectively measure patient progress using PROs, optimize person-centered care, and enhance the collective competence of the team. Although a physician, physician assistant, or nurse practitioner may ultimately retain primary responsibility for executing a treatment plan, attention to holistic, biopsychosocial care is recognized as an important component of patient outcomes; therefore, a high value is placed on the input of the entire team.

To bolster team-based care, we designed facilitated interprofessional case conferences for each of the three conditions specifically to: (1) foster mutual trust and communication among health professionals; (2) create and address common goals for patient care; (3) enhance individual and group learning; (4) recognize individual roles and responsibilities of team members; (5) role model team-based care for medical students, residents, and fellows; and (6) reduce the traditional power differential among physicians and other health care professionals. In addition, we aimed to address the four domains of health care quality as defined by the Institute of Medicine.[15]

1. Quality, or the degree to which health care services increase the likelihood of desired health outcomes, represent a positive health care experience for patients, and evidence-based practice.
2. Safety, which is defined as the reduction or elimination of preventable harm to patients;
3. Value, which is calculated health outcomes that matter to patients divided by the cost of care; and
4. Equity, or the determination that a patient's health is not compromised or disadvantaged because of race, ethnicity, gender, socio-economic status, sexual orientation, level of education, housing environment, or other social determinants.

At the time of the study, case conferences were scheduled to occur up to three times per week for 75 minutes per session. Each session focused on one of the three clinical conditions. Clinical time was specifically allocated to case conferences to ensure the availability and participation of the team. To role model situational leadership, the conferences were facilitated by a nurse practitioner or physician assistant. Before each session, patient cases were solicited from all clinical team members for inclusion in each conference. Conferences began with a facilitator's statement regarding the team's underlying values (Figure 1), reflecting a philosophy that "everyone teaches, everyone learns." This was followed by a brief, 10-minute group learning session on a relevant clinical topic that was presented by a team member, resident, or medical student in attendance. After the presentation, patient cases were reviewed and evidence-based treatment plans were developed or patient-reported outcomes were discussed. Facilitators invited participation from all attendees and decisions included input from all team members. The resulting plans of care were summarized in an oral presentation by a medical student or resident and were documented in the electronic health record.

Survey research focused on the outcomes of the conferences as it aligned to the aforementioned objectives. The study was approved by the university institutional review board. There were no known risks to survey participation. The participants' identities were protected; surveys were anonymous, cookies were not used, and internet protocol addresses were unique. There was no compensation to participate in the study.

TABLE 1.
Integrated Practice Unit (IPU) Clinic and Conference Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
Vulvar disorder clinic and case conference	General obstetrics and gynecology clinic	**Pelvic floor disorder clinic and case conference**	General obstetrics and gynecology clinic	**Pelvic pain disorder clinic and case conference**

The research team created two versions of a questionnaire to query the effectiveness of the case conferences (Table 2). Survey items were developed after conducting a literature review on topics such as multidisciplinary and interprofessional teams, IPC, and IPE. Face and content validity for items were addressed by well-defining the constructs and after consultation with faculty and clinicians, and clinicians-in-training (ie, medical students, residents, and fellows). Criterion-related validity was accomplished by empirical association with the existing scales on the constructs of interest. The first version of the survey, or "long survey" was administered a total of two times: once at the start of the data collection period and again at the end to assess overall case conference participant's perspectives. Items covered domains such as communication, knowledge, and patient care of the individual participant, communication, knowledge, and patient care of the team, the focus of the case conferences (ie, quality, safety, value, or equity), and the overall effectiveness of each conference. The "short survey" included a subset of items from the long survey within the domains of team knowledge and patient care. The short survey was administered immediately after each case conference session during the study period. The survey used a seven-point Likert scale with anchors ranging from "strongly disagree" to "strongly agree." Optional open-ended feedback was requested in both survey versions.

The convenience sample was comprised of a diverse representation of women's health clinicians. Eligible participants included professionals attending the women's health department IPU case conferences and were recruited in-person by nonprobability purposive sampling. All eligible case conference participants were emailed a link to the survey immediately upon the conclusion of the conference or within one business day. Email messaging included a description of the survey aims and processes. In addition, information about the survey purpose, respondent eligibility, minimal risks, anonymity, and lack of compensation was included. Completion of the survey implied consent and respondents were free to discontinue the survey at any time.

Data were collected from October 2019 to February 2020 via Qualtrics survey software. Data collection was subsequently suspended because of COVID-19. One hundred thirteen short surveys and 51 long surveys were completed for a total of 161 survey responses. Data were downloaded from Qualtrics into SPSS version 26 statistical software (IBM Corp, Released 2019. IBM SPSS Statistics for 26.0, Armonk, NY: IBM Corp) for analyses. Immediately after the download, a review for missing data and distribution was conducted. Only completed surveys were analyzed. Descriptive analyses included frequency, percentage, means, standard deviation, and Pearson correlation analysis. The research team followed the CHERRIES checklist for reporting results.[34]

Patient Outcomes

A central facet of this care model requires that patients complete validated patient reported outcome (PRO) instruments throughout the course of their treatment to provide their own individual perspective on the progress of their health.[35] PROs are followed longitudinally by the entire interprofessional team, which is on hand to holistically address the needs of the patient in a single clinic location. Specifically, the Patient Global Impression of Improvement (PGI-I) is used to measure the patient's interpretation of symptom change after an

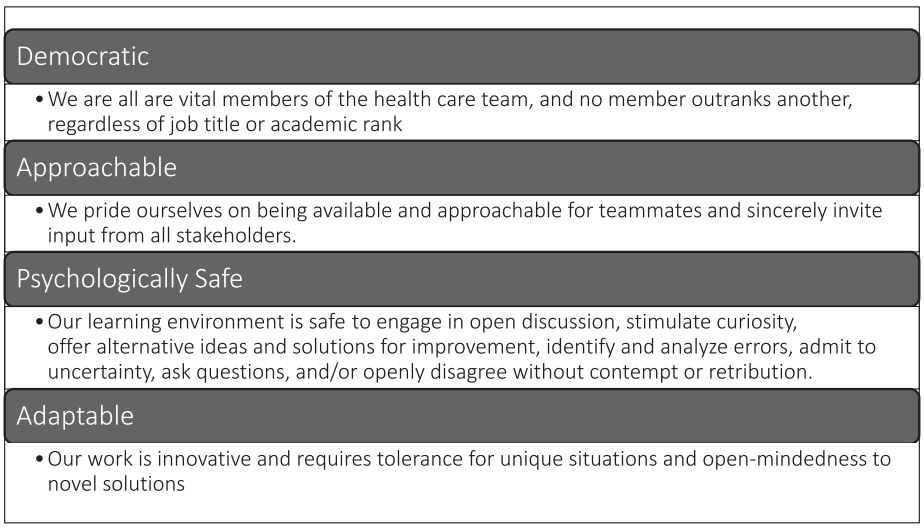

FIGURE 1. Interprofessional case conference core values

TABLE 2.
Survey Domains and Items

Domain	Items
Knowledge: Individual	1. The presentations enhance/reinforce my medical knowledge. 2. The team discussions enhance/reinforce my medical knowledge. 3. My understanding of team member roles is clear. 4. My understanding of my own role is clear.
Communication: Individual	1. I feel comfortable voicing my opinion in case conference. 2. I feel comfortable asking questions in case conference. 3. In making patient care decisions, I mainly consult with colleagues from my own profession.
Patient care: Individual	1. I improve my ability to triage challenging patients by attending case conference. 2. I am able to modify the management of my patients as necessary. 3. I enhanced the quality of care that I provide to patients.
Knowledge: Team*	1. The clinicians-in-training presentation modified team decisions. 2. Clinicians-in-training presentations are used in decision-making regarding patient care plan. 3. Discussions of the evidence influenced team decisions. 4. Group learning enhanced the knowledge of the overall team.
Patient care: Team*	1. Patient goals were discussed for all patients as applicable. 2. Psychosocial aspects of care were addressed as applicable. 3. Barriers to care were addressed as applicable. 4. Patient outcomes were discussed for patients as applicable. 5. All team members present were able to share their expertise. 6. Plans of care were optimized based on team consensus. 7. Pathways were optimized based on team consensus.
Focus of case conference	1. Quality: Defined as the degree to which health care services increase the likelihood of desired health outcomes, represent a positive health care experience for patients, and evidence-based practice. In general, case conference is effective in addressing quality. 2. Safety: Defined as reduction or elimination of preventable harm to patients. In general, case conference is effective in addressing safety. 3. Value: Defined as health outcomes that matter to patients at the lowest cost. In general, case conference is effective in addressing value. 4. Equity: Defined as patient's health not compromised or disadvantaged because of race, ethnicity, gender, income, sexual orientation, neighborhood, or other social condition. In general, case conference is effective in addressing equity.
Overall conference effectiveness	1. In general, case conference is an effective means to enhance medical knowledge. 2. In general, case conference is an effective means to enhance the provision of team-based care. 3. In general, case conference is an effective means to improve the quality of patient care. 4. In general, case conference is a means to improve patient reported outcomes.

*Included in the long and short surveys.

intervention. The PGI-I is a validated 7-point single-item scale, "Check the number that best describes how your condition is now, compared with how it was before treatment," from "very much better" (1) to "very much worse" (7).[36]

Patients who attended two follow-up clinical visits between October 2019 to February 2020 were included in the sample population used to assess self-reported outcomes ($n = 208$). The first visit referred to the first follow-up encounter within the specified timeframe and the last visit referred to the final recorded follow-up encounter within the specified timeframe. All patients who attended only one visit were excluded from the sample. For patients who attended more than two visits, only their first and last recorded appointments during the timeframe were included in the analysis. A paired sample *t* test was used to examine the differences in self-reported condition between patient's first and last visit.

RESULTS

Team Outcomes

Survey items related to the domains of team knowledge and patient care were presented in the short and long surveys. The remaining domains were also presented in the long survey (Table 2). The surveys were administered over the data collection period to a possible total of 374 participants and achieved an overall response rate of 43%. Reported response percentages include a combination of "strongly agree" and "agree" responses.

Demographics (n = 157)

Demographic information was collected at the respondents' option. Case conference attendees included members of the interprofessional health care team (Figure 2). Participants were comprised of health professionals (attending physician, nurse practitioner, physician assistant; 40%, $n = 63$), medical trainees (fellow, resident, medical student; 33.1%, $n = 52$), administration, leadership, other faculty (10.2%, $n = 16$), allied health professionals (pelvic floor physical therapist, social worker, dietitian; 9.6%, $n = 15$), and other medical professionals (nurse, medical assistant; 7%, $n = 11$). Because of the nature of the academic setting with clinicians-in-training, there was some divergence in the actual individuals who participated in the conference; however, most anonymous respondents reported to attend more than one case conference per week (78%), and therefore, representation of the defined interprofessional roles was consistent.

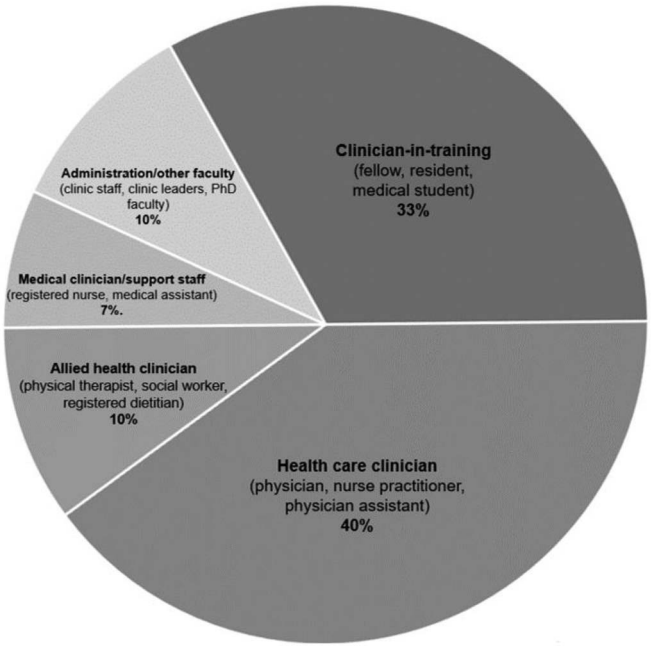

FIGURE 2. Case conference participant demographics

Individual Participant Knowledge, Communication, and Patient Care (n = 51)

Individual clinical knowledge was enhanced by presentations (100%) and team discussions (98%). Participants recognized individual roles (98%) and the roles of other participants on the team (97.1%). Case conference attendees felt comfortable voicing their opinion (94.1%) and asking questions (92%). When making patient care decisions in practice, 64% of participants consulted with colleagues from other health care professions, whereas 36% consulted mainly with colleagues from their own profession. (Figure 3). Overall, respondents who attended case conferences improved on their ability to triage challenging patients (89.3%), modify patient management plans (97.8%), and enhanced the quality of care they provided to patients (97.8%).

Team-Based Knowledge and Patient Care (n = 164)

Team decisions for patient treatment plans were made (91.8%) or modified (85.7%) after the clinician-in-training presentation. Evidence-based discussions influenced team decisions (95%) and group learning exercises enhanced the knowledge of the overall team (95.1%). Patient goals, patient outcomes, psychosocial aspects of care, and barriers to care were discussed or addressed as applicable (88%, 91.2, 95%, 94.4% respectively). Team members felt that they were able to share their expertise (93.7%) during the discussions, that team-based care was applied to all patients presented when appropriate (95.9%), and that plans of care and pathways were optimized based on team consensus (100%).

Focus of Case Conferences (n = 49)

In general, case conferences were effective in addressing the four Institute of Medicine domains: quality (98%), safety (85.4%), value (95.7%), and equity (87.5%). The strongest relationship existed between equity and safety (r = .689, P = .00).

Conference Effectiveness (n = 51)

Case conferences were an effective means to enhance clinical knowledge (100%) and the provision of team-based care (97.9%). In addition, the conferences were perceived as a way to improve the quality of patient care (100%) and patient-reported outcomes (97.9%).

Open-Ended Feedback

The qualitative feedback received was limited. Many strengths were noted across conferences. The team approach and cross-discipline learning to promote high-quality, comprehensive care was described as a benefit to patients. Free-flowing conversation among the entire team was noted to be valuable, although the conversation often centered on addressing the

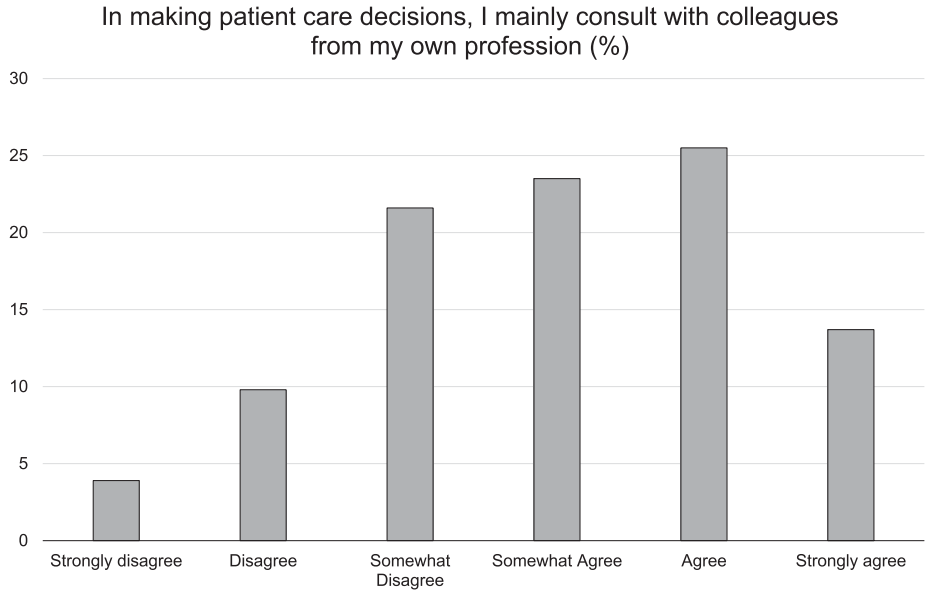

FIGURE 3. In-practice consultation with colleagues from other health professions

patient goals. Case conferences were believed to increase the provision of value-based care; however, it was felt that expansion of discussions on economic barriers to care could benefit the team.

Growth opportunities included a better balance of time allocation between learning and patient care discussions. Capping the time for interesting discussion after an engaging learning presentation ensured that there was adequate time to discuss patient cases. Feedback varied in response to the presentation style of the individual facilitator by case conference type. For example, participants in the vulvar conferences felt there was an opportunity to improve the focus, organization, preparedness, and structure of these sessions. Furthermore, team dynamics and the quality of the discussion were dependent on the team members present by conference type, accounting for those who were absent or late.

Patient Outcomes

Collective Competence

In the six-month period of time in which this study took place, there was a statistically significant improvement between the patient's first follow-up visit (M = 3.25, SD= 1.12) and last visit (M = 2.82, SD= 1.13), t(207) = 5.47, $P < .0001$, using the PRO, PGI-I.[36]

DISCUSSION

IPC and education have been proposed as being essential to the delivery of high-quality health care.[8,9] The literature suggests that case conferences are an effective IPE intervention to promote team-based care.[10,24–32] This study describes the experience of interprofessional teams within a women's health IPU that incorporated regular, weekly case conferences to address complex clinical questions, produce comprehensive decisions, implement coordinated actions to manage patients, and engage in interprofessional learning.[37] The objectives of the conferences are to build trust, improve communication, reduce existing power differentials, enhance coordinated care, and reinforce knowledge in an effort to build collective competence in a CoP.

This study addressed many factors pertaining to health care delivery in an IPU clinic, including IPC and IPE. The survey items queried knowledge and patient care at the individual and group level and communication, the focus of case conferences, and their overall effectiveness. Participants consistently reported favorable responses for attainment of clinical knowledge and their ability to triage and create plans for complex cases and enhance the quality of patient care on an individual level. Three-quarters of participants used the conferences to consult clinicians from different professions rather than primarily consulting colleagues from their own profession. This result suggests that the conferences meet a desired clinician need for IPC in care delivery and support a culture shift toward enhanced collaboration. From a team perspective, responses indicated that case conferences were an effective means to enhance clinical knowledge, facilitate team-based care, improve the quality of care, and use PROs to guide clinical decision-making. Participants responded positively regarding the learning benefit of presentations, the use of evidence-based practice, and the discussions on barriers and other psychosocial factors affecting patients. They valued the consensus-driven approach to the coordination of treatment plans.

Case conferences were also a means to assess care delivery in a number of ways. In addition to providing a structured avenue to implement standardized care pathways, it served as a forum to modify these pathways based on emerging evidence and where appropriate. The facilitated conference sessions enabled the team, including medical students, residents, and fellows, to suggest and discuss alternate approaches for patients whose goals were not met or adherent to the pathways. Discussions were held until unanimity was reached. This consensus-driven approach created an opportunity for members of the care team to engage with one another as a CoP.

Although the primary aim of this study was to describe team dynamics within the case conferences, an underlying goal of the team discussions was to ultimately bolster the quality of patient care delivery and outcomes. Notably, PGI-I data collected as part of standard clinical intake demonstrated patient improvement while in the care of the team, reflecting the CoP's overall collective competence. Although only six months of data were available during the study period because of logistical changes in the PRO collection process, the outcomes are likely to be reflective of the overall study period because no other changes within the IPUs occurred during that time.

The primary strength of the study is that it addressed the perceptions of the case conferences among health professionals in a CoP as part of a novel approach to patient care. Participants were queried about themes that were the central aims of the conferences, many of which centered around collective competence and other aspects of the CoP. Anonymous survey methods protect the privacy of respondents, which may improve cooperation and honest feedback.[38] The study provided a team-based framework that could be modified to accommodate a traditional clinical setting to enhance the collective competence of a CoP within the broader medical community and improve patient outcomes.

Limitations of the study include its implementation at a single institution; thus, external validity was not established. As most traditional clinic models do not collect PROs while simultaneously engaging in IPC or IPE in a single clinical space, there may be modifications needed to implement or directly compare this model with a traditional setting. The study design is also a limitation. The cross-sectional, descriptive methodology precludes the ability to establish causal relationships and limits understanding of trends over time.[39] Self-reporting inherent in survey methodology also affects generalization of findings.[40] In addition, the survey response rate was 43% and selection bias was possible because of the use of a convenience sample. The use of an anonymous survey limited the ability to analyze trends and perceptions among team members by role. Also, survey responses indicated that presentation styles varied by conference session, thus formal training or professional development in facilitation skills could further improve team building opportunities in this setting.

The exploratory nature of this study provides several areas of intrigue to guide future work. For example, a study using PRO data to compare the patients' perspective of their care to the clinical team's perceptions could reveal valuable insight into any perceived differences in the quality, value, safety, or equity

of care. In addition, there is no current literature to guide appropriate expectations for improvement in PGI-I scores in patients with complex gynecologic disorders such as those seen in our clinic. Finally, we would be interested in gaining deeper insights regarding the impact of the conferences on medical students, residents and fellows in their knowledge acquisition and their perceptions of the quality of care provided within the IPU clinical model.

CONCLUSION

The interprofessional case conferences are an effective means to enhance the collective competence of the team to deliver high-quality, patient-centered care in a novel clinic model. Team consensus and PROs were used to drive decision making, evaluate patients' progress over time, and modify treatment plans when indicated. The establishment of core team values that underscores the importance of each CoP member disrupted the traditional power structure. This approach fostered an environment of inquiry and communication that allowed the team to evaluate and adjust care pathways on a continual basis. Additional research is needed to assess the impact of the case conferences on medical students, residents, and fellows. It may also be worthwhile to explore how these principles can be implemented in traditional clinical settings. This exploratory study revealed that team members engaged in valuable IPC and IPE opportunities that enhanced their collective competence and the quality, safety, value, and equity of care.

Lessons for Practice

- Engaging a nurse practitioner, physician assistant, nurse, medical assistant, dietician, social worker, or physical therapist to plan and facilitate case interprofessional conferences is one way to deconstruct the hierarchy of a CoP.
- Case conferences provide a suitable format to evaluate the effectiveness of the health care team using PRO as one tool to measure quality of care.
- Clinical leaders should allocate time to allow the CoP to assemble and participate in IPC and IPE to enhance collective competence.

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