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ORIGINAL RESEARCH

Family, nurse, and physician beliefs on family-centered rounds: A 21-site study

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Abstract

Background: Variation exists in family-centered rounds (FCR).

Objective: We sought to understand patient/family and clinician FCR beliefs/attitudes and practices to support implementation efforts.

Designs, Settings and Participants: Patients/families and clinicians at 21 geographically diverse US community/academic pediatric teaching hospitals participated in a prospective cohort dissemination and implementation study.

Intervention: We inquired about rounding beliefs/attitudes, practices, and demographics using a 26-question survey coproduced with family/nurse/attending-physician collaborators, informed by prior research and the Consolidated Framework for Implementation Research.

Main Outcome and Measures: Out of 2578 individuals, 1647 (64%) responded to the survey; of these, 1313 respondents participated in FCR and were included in analyses (616 patients/families, 243 nurses, 285 resident physicians, and 169 attending physicians). Beliefs/attitudes regarding the importance of FCR elements varied by role, with resident physicians rating the importance of several FCR elements lower than others. For example, on adjusted multivariable analysis, attending physicians (odds ratio [OR] 3.0, 95% confidence interval [95% CI] 1.2–7.8) and nurses (OR 3.1, 95% CI 1.3–7.4) were much more likely than resident physicians to report family participation on rounds as very/extremely important. Clinician support for key FCR elements was higher than self-reported practice (e.g., 88% believed family participation was important on rounds; 68% reported it often/always occurred). In practice, key elements of FCR were reported to often/always occur only 23%–70% of the time.

Result: Support for nurse and family participation in FCR is high among clinicians but varies by role. Physicians, particularly resident physicians, endorse several FCR elements as less important than nurses and patients/families. The gap between attitudes and practice and between clinician types suggests that attitudinal, structural, and cultural barriers impede FCR.

INTRODUCTION

In 2012, the American Academy of Pediatrics and the Institute for Patient and Family-Centered Care recommended family-centered rounds (FCR): rounds occurring in the patients' room with involvement from families and nurses.¹ Patient/family involvement during key clinical decision-making activities is associated with fewer miscommunications and improved patient/family experience and engagement.^{2–11} Objectives of FCR include providing daily updates and formulating a shared understanding with the patient/family; however, FCR practice varies.^{6,11–18} FCR elements may include standard presentation formats (e.g., SOAP: subjective-objective-assessment-plan),¹⁹ family/nurse participation, teaching, use of plain language, and written plans.^{4,6,20,21}

To address FCR variability, the Patient and Family-Centered (PFC) I-PASS Study Group developed the PFC I-PASS program for FCR, which includes standardized bidirectional communication for rounds, family/nurse engagement, health literacy best practices, and a written rounds summary.¹³ Following the initial implementation of PFC I-PASS in seven academic medical centers, harmful medical errors fell by 38%, and several facets of patient and family experience improved.¹³ However, the poststudy qualitative analysis identified multiple barriers to implementation and adoption. Subsequently, as part of a larger dissemination and implementation study of PFC I-PASS, known as the PFC I-PASS Safer Communication on Rounds Everytime (SCORE) Study,²² we conducted a baseline analysis of patient/family, nurse, and physician beliefs/attitudes, and self-reported practices about FCR.

METHODS

We collected baseline data across 21 geographically diverse community and university-based pediatric teaching hospitals in the United States participating in the PFC I-PASS SCORE Study.¹³ The study population included patients/families, nurses, resident physicians, and attending physicians. Clinicians not participating in FCR were excluded from the sample. We included English, Arabic, Mandarin, and Spanish-speaking families and patients (if age \geq 13). Boston Children's Hospital provided IRB approval.

Informed by prior research¹³ and the Consolidated Framework for Implementation Research,²³ we coproduced with family/nurse/attending-physician collaborators a 26-question survey about participant demographics, experience with FCR, importance beliefs/attitudes ratings, and occurrence ratings of key FCR elements using Likert scales. Questions explored communication between rounding members, rounding format, and limitations to adherence (Supporting Information). The Likert-scaled survey had a sixth-grade Flesh-Kincaid reading level and was translated into Arabic, Mandarin, and Spanish.

During the study, we administered the survey to two randomly selected patients (\geq 13 years) or family members (of any age) per week per site before anticipated discharge. We surveyed resident physicians before their end-of-rotation on study units, and nurses and attending physicians as convenience samples. Participants completed surveys electronically (via computer/tablet/QR code) or on paper, facilitated by a study team member.

SETTING

Twelve university-based and nine community-based teaching hospitals throughout the United States participated. Twenty sites were general pediatric units, one was a subspecialty. Sites were free-standing children's hospitals ($n = 4$), pediatric hospitals within larger systems ($n = 14$), or within adult hospitals ($n = 3$). Pediatric residency program sizes ranged from 15 to 150. None of the sites had previously formally implemented PFC I-PASS.

STATISTICAL ANALYSIS

Demographic characteristics of clinicians (nurse, resident physicians, and attending physicians) and patient/family participants were summarized with counts and percentages. Associations between demographic characteristics and clinician role were assessed with χ^2 tests.

Self-reported beliefs about the importance of key FCR elements were dichotomized into "very" or "extremely" important versus "somewhat," "a little bit" or "not at all" important. These groups were labeled as those with "high perceived importance" and "low perceived importance," respectively. Self-reported clinician practice of FCR elements was dichotomized into "often" or "always" occurs versus "sometimes," "rarely," or "never" occurs.

We used mixed effects logistic regression to model the rate of belief (very or extremely important) for each of the key FCR elements by role. Random intercepts were included to adjust for clustering by site. Least squares estimates and 95% confidence intervals (95% CI) are reported. We performed all pairwise comparison tests for differences in beliefs by role with a Bonferroni adjustment for multiple comparisons. Among clinicians, we used mixed effects, and multivariable logistic regression to estimate the association between role and belief of the importance of family participation on rounds adjusting for clinician gender, age, race and ethnicity, and years of experience. We used mixed effects logistic regression to compare the rates of practice for the FCR elements (family participation, nurse participation, plain language, and written plan) between clinicians with high perceived importance and those with low perceived importance. All analyses were performed using the SAS System for Windows v9.4.

RESULTS

Sample characteristics

Out of 2578, 1647 individuals returned surveys. Twenty-two were excluded for missing information, leaving 1625 surveys: 616 patients/parents, 441 nurses, and 568 physicians (369 resident physicians; 199 attending physicians). The overall response rate was 64%. We excluded 312 surveys (providers who had never participated in FCR were excluded because the questions related to experience with FCR), leaving 1313 for analysis (Supporting Information: Table 1). Relationship to the patient, age, gender, race and ethnicity, language proficiency, education, and income demographics varied among patient/family respondents (Supporting Information: Table 2a); most patient/family respondents were female, English proficient, with adequate health literacy, and with some college education. Age, race, and years of experience varied across clinician types (Supporting Information: Table 2b), however, most were female and non-Hispanic white. Most attending physicians had more than 6 years of experience while the nursing experience was evenly distributed among the categories of experience.

Patient/family and clinician beliefs and attitudes about FCR

Most respondents reported that the main purpose of rounds was for doctors, nurses, and patients/families to talk and to give information to each other (families 93%; nurses 93%; resident physicians 81%; attending physicians 85%) over other choices (i.e., for doctors to talk and give information to each other; for doctors and nurses to talk and give information to each other; for doctors and patient/family to talk and give information to each other; to help teach doctors [train residents]). Beliefs/attitudes about the importance of FCR elements varied by role. Resident physicians rated all items except "physician participates on rounds" lower in importance than all other team

members. Resident- and attending-physician groups each rated the importance of the family-related elements (i.e., “family shares understanding of the plan” and “diagnosis/plans written down for the family”) lower compared to families and nurses ($p < .05$; Figure 1).

Predictors of family participation on rounds

In unadjusted models, clinician type, gender, age, and years of experience were associated with believing family participation on rounds is important. In adjusted multivariable models, only clinician type was a significant predictor, with attending physicians (odds ratio [OR] 3.0, 95% CI 1.2–7.8) and nurses (OR 3.1, 95% CI 1.3–7.4) being much more likely than resident physicians to report that family participation on rounds was very or extremely important (Table 1).

Rates of clinician rounding beliefs and practices

Clinician ratings of the importance of various FCR elements were generally higher than self-ratings of their experience with those elements in practice. For elements that were rated as very and extremely important, clinicians reported them often or always occurring in practice only 23%–70% of the time (Figure 2). For instance, 88% of clinicians believed family participation on rounds was very/extremely important but only 68% of clinicians reported that the family expresses concerns often/always (Figure 2). This gap between belief and practice persisted across FCR elements, with variation by specific element and role type (Supporting Information: Figure 1).

Relationship between clinician beliefs versus self-reported practices

Behaviors rated as more important were performed more often across all clinician types, though none were close to 100%. For instance, among clinicians who believed patient/family participation to be very/extremely important, 71% reported the family often or always expressed concerns when they round; as compared to only 49% who believed patient/family participation not to be very/extremely important ($p < .001$; Figure 3). Despite clinicians reporting that an FCR element was very or extremely important (e.g., use of plain language), when stratified by role, no element was reported to be “often” or “always” practiced by more than 82% of respondents (Supporting Information: Figure 2). For example, attending physicians who rated family participation as very/extremely important (“high perceived importance” in Supporting Information: Figure 2) reported this practice occurring often/always 76% of the time; in contrast, attending physicians who did not rate family participation to be very/extremely important (“low perceived importance” in Supporting Information: Figure 2) reported this practice occurring often/always 41% of the time. Attending physicians who reported nurse

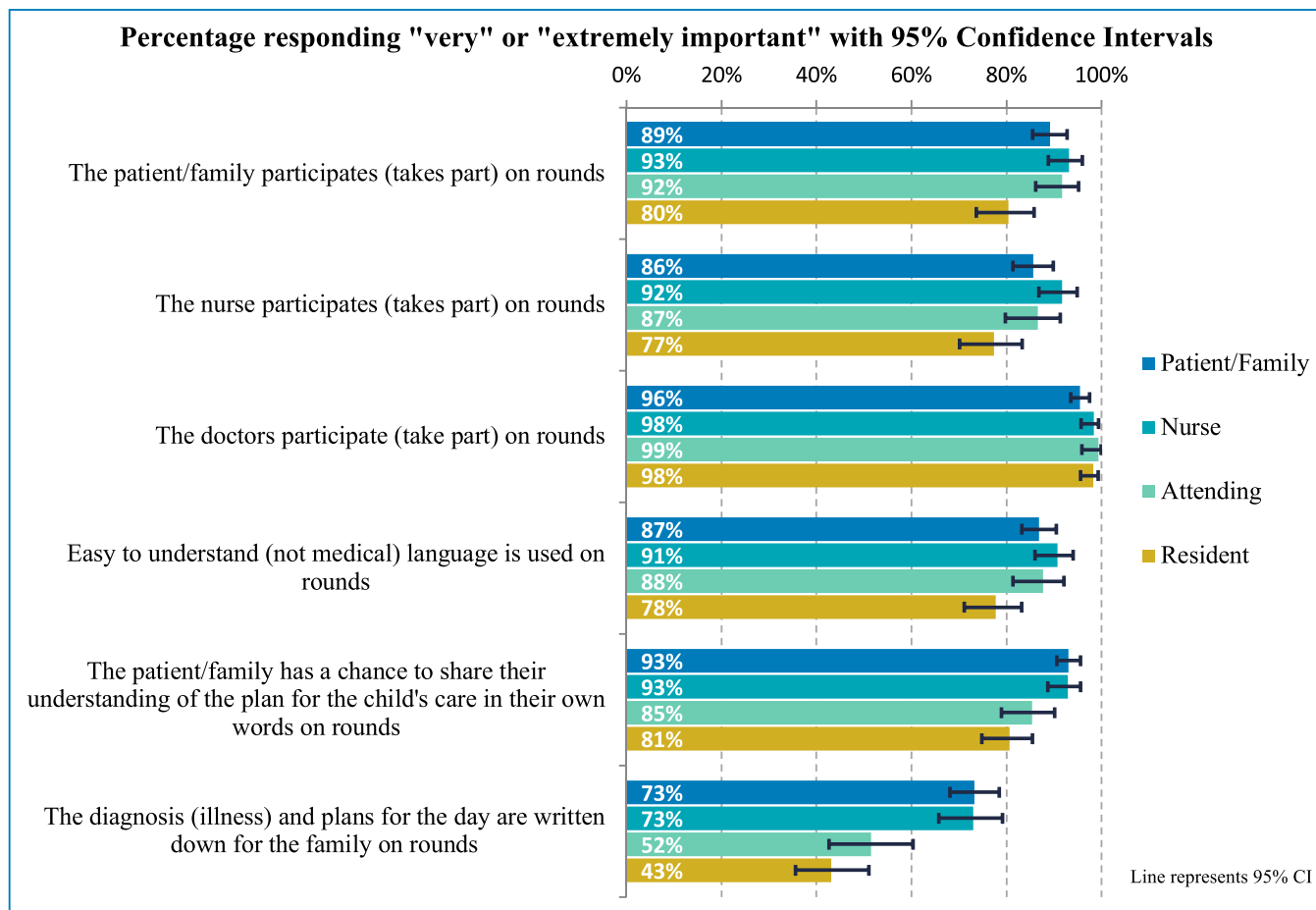
participation as very or extremely important reported it occurring often/always only 39% of the time (Supporting Information: Figure 2). There were no statistically significant differences in the gaps by role.

DISCUSSION

Patients/families, nurses, resident physicians, and attending physicians in 21 geographically diverse inpatient pediatric units in university- and community-based teaching hospitals reported considerable variation in beliefs/attitudes regarding common rounding elements. While there was broad agreement on the purpose of rounds, namely, to share ideas among team members, beliefs about the importance of individual FCR elements varied among team members. Clinician beliefs that specific FCR elements were important consistently exceeded self-reported rates of their actual practice. Respondents who believed a particular FCR element was important were more likely to report that element occurring.

While all role groups endorsed the importance of FCR, differences in ratings of the importance of specific FCR elements existed between groups. Resident physicians rated nurse participation, use of plain language, and checking for understanding as less important than others. Notably, resident physicians were three times less likely than nurses or attending physicians to rate family participation in rounds as important. This may reflect resident physician developmental level for learning (e.g., a need to focus on the science of medicine over the interpersonal aspects of the practice of medicine); multiple competing workflow demands; cognitive overload, and/or burnout; or, it may signify a gap in knowledge about the benefits of achieving a shared understanding about clinical status and plans by the entire team early in the day.^{5,10,24} This suggests that additional work is needed to ensure that FCRs are meeting the needs of resident physicians, a crucial stakeholder for FCR in teaching hospitals. Important resident physician specific considerations like time, work, resource compression, and high patient acuity must be accounted for to effectively perform FCR in a manner aligned with resident needs.

Family responses aligned most closely with nurse responses for FCR elements. This alignment may reflect the valuable collaboration between patients/families and nurses compared to others.^{4,7,10,19,25–28} Resident- and attending-physician responses were also closely aligned, perhaps due to congruous workflows, shared training, and culture. Both attending- and resident-physician responses varied from family and nurse importance ratings. These findings demonstrate that not all stakeholders have agreement on or shared understanding about the essential elements of FCR, with resident physicians having beliefs/attitudes most discordant from those of families and nurses. Except for physician participation, residents consistently rated the importance of FCR elements lowest of all team members. This is consistent with existing literature on resident physician attitudes about FCR, which describe questioning whether the



Pairwise Comparisons of Family Centered Rounds Elements by Role						
	Resident vs Attending	Resident vs Nurse	Resident vs Patient/Family	Attending vs Nurse	Attending vs Patient/Family	Nurse vs Patient/Family
Family/patient participation on rounds	**	***	**			
Nurse participation on rounds		***	*			
Doctor participation on rounds						
Plain language used on rounds		***	**			
Patient/family has a chance to share their understanding of the plan of care in their own words		***	***		*	
Diagnosis and plans for the day are written down for the family		***	***	***	***	

* p<.05, ** p<.01, *** p<.001

FIGURE 1 Self-reported beliefs about the importance of key family-centered rounds elements by role. There were no differences between families and nurses in most components. Residents rate all rounding components lower than nurses and families except for physician participation on rounds. Bonferroni adjusted *p* values to account for multiple comparisons. **p* < .05; ***p* < .01; ****p* < .001.

TABLE 1 Resident physician, attending physician, and nurse beliefs regarding the importance of family participation on rounds

	N	Very or extremely important, N (%)	Unadjusted OR	p Value	Adjusted OR	p Value
Provider type						
Resident	285	224 (78.6)	Ref	<.001	Ref	.02
Attending	169	154 (91.1)	2.5 (1.4, 4.6)		3.0 (1.2, 7.8)	
Nurse	243	227 (93.4)	3.4 (1.8, 6.2)		3.1 (1.3, 7.4)	
Gender						
Male	138	112 (81.2)	Ref	.03	Ref	.16
Female	530	470 (88.7)	1.8 (1.1, 3.1)		1.4 (0.8, 2.5)	
Other/declined	16	10 (62.5)	0.6 (0.1, 2.5)		0.4 (0.1, 2.0)	
Age (years)						
18–34	412	356 (84)	Ref	.02	Ref	.19
35–44	154	135 (87.7)	1.2 (0.7, 2.2)		0.7 (0.3, 1.6)	
45–74	117	111 (95.7)	3.9 (1.5, 10.1)		2.0 (0.5, 7.8)	
Race and ethnicity						
Asian, non-Hispanic	109	94 (86.2)	0.9 (0.4, 1.6)	.45	1.1 (0.6, 2.2)	.46
Black, non-Hispanic	35	31 (88.6)	1.3 (0.4, 4.1)		1.7 (0.5, 5.3)	
Hispanic	47	42 (89.4)	1.3 (0.5, 3.5)		1.6 (0.6, 4.3)	
White, non-Hispanic	419	363 (86.6)	Ref		Ref	
Other, non-Hispanic	29	23 (79.3)	0.5 (0.2, 1.4)		0.7 (0.2, 1.9)	
Multiracial, non-Hispanic	28	27 (96.4)	4.3 (0.6, 32.7)		5 (0.6, 39.7)	
Years of experience						
<1	159	127 (79.9)	Ref	.02	Ref	.96
1–5	259	220 (84.9)	1.4 (0.8, 2.4)		1.1 (0.6, 1.9)	
6–15	159	143 (89.9)	1.9 (1, 3.8)		0.9 (0.3, 2.6)	
≥16	110	105 (95.5)	4.6 (1.7, 12.5)		1.1 (0.2, 5.1)	

Note: Bold values indicate $p < .05$.

Abbreviations: OR, odds ratio; Ref, reference.

practice of FCR negatively impacts learner efficiency, teaching, psychological safety/comfort, and autonomy.^{7,25,28–30} Understanding the needs of resident physicians during FCR (e.g., having time and support to enter orders or call consults in between patient rooms) can help address misalignment and is crucial to operationalizing effective FCR in teaching hospitals. Future work should investigate ways to support resident-physician needs during FCR.

Clinician beliefs that specific rounding features were very or extremely important consistently exceeded reported rates of actual practice. Respondents who believed in a particular rounding feature were also more likely to report performing it but those deeming an FCR element as important did not report performing it close to 100% of the time. These findings point to

the important role that beliefs/attitudes play in the implementation and the influence of non-attitudinal factors on practice adherence.

Addressing attitudinal barriers can be complex. Normalization process theory is a sociological theory in which individuals must assign meaning to an action (sensemaking), commit, expend effort, and assess the value of an action before complex behaviors become routine practice.³¹ This theory suggests that gaps between resident-physician beliefs and other stakeholder beliefs may be narrowed by ensuring resident physicians understand and accept the benefits of nurse and family engagement (i.e., sensemaking). Promoted at the organizational and team level, sensemaking may help narrow the belief gaps demonstrated by team members to incorporate nurse and family input during FCR; however basic workflow needs must first and foremost be

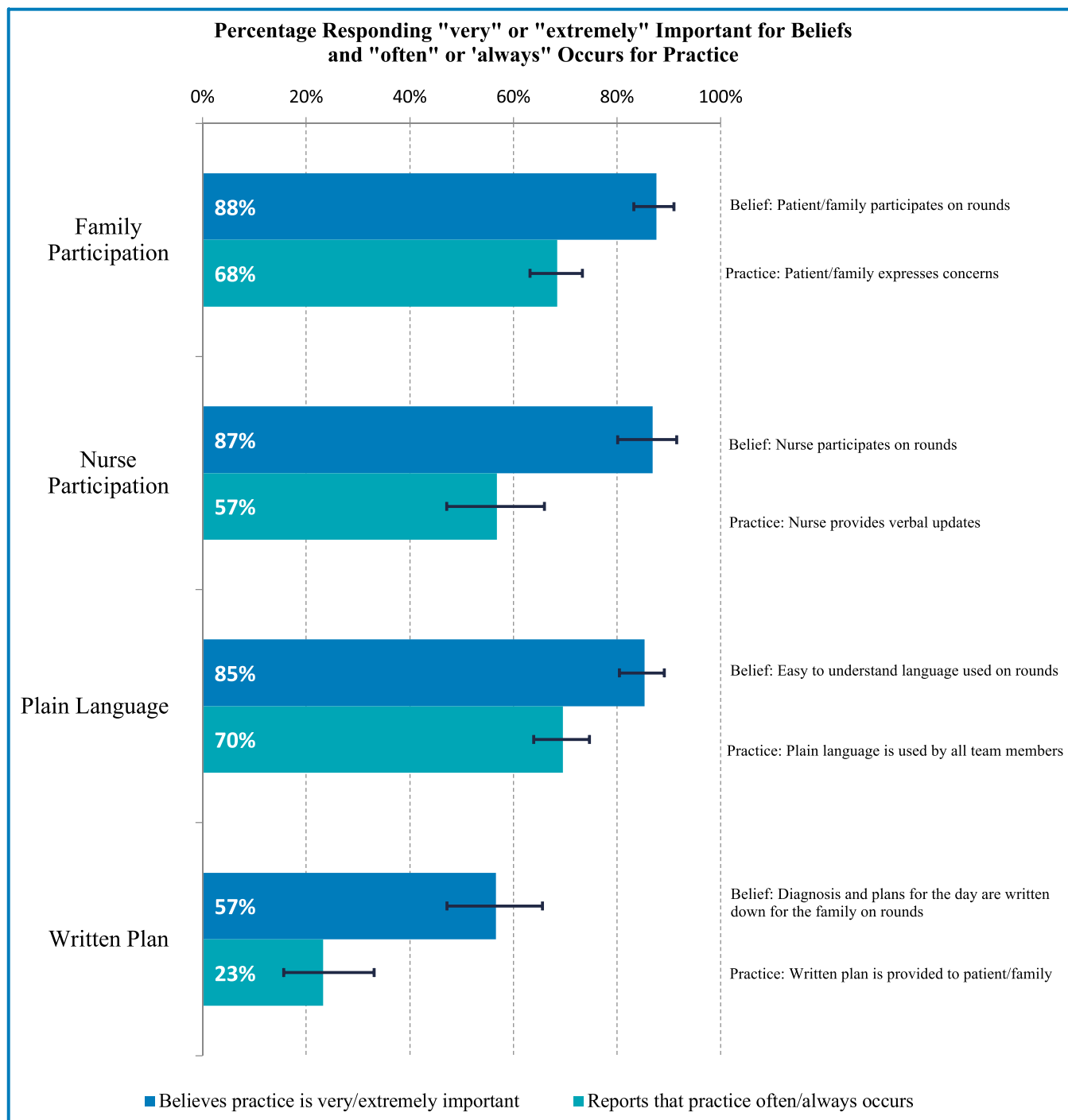


FIGURE 2 Clinician (nurse, resident physician, and attending physician) self-reported beliefs and practices regarding the importance and practice of family-centered rounds elements.

understood. A future area of study is to systematically assess how resident physicians (as crucial members of FCR, who may have less input into how FCR will be conducted compared to attending physicians) would prioritize elements of FCR if given an opportunity to build a model of FCR “from scratch.”³²

Consistent with other studies, the presence of non-attitudinal barriers to performance may include logistical or staffing barriers.^{4-7,10,11,17,20,26,33-35} Families and nurses who intend to attend

FCR are not always able to participate given variability in FCR timing (historically physician-driven),³⁵ or competing clinical responsibilities (e.g., medication administration).^{25,36} Variable rounding practice may affect language interpreter scheduling, impacting the engagement of families with limited English proficiency in care.^{10,11,35,37-40} Similarly, variability in the timing of rounds may disproportionately burden families who require advanced notice or a fixed timeframe in order to participate in rounds. The role of telehealth in engaging team

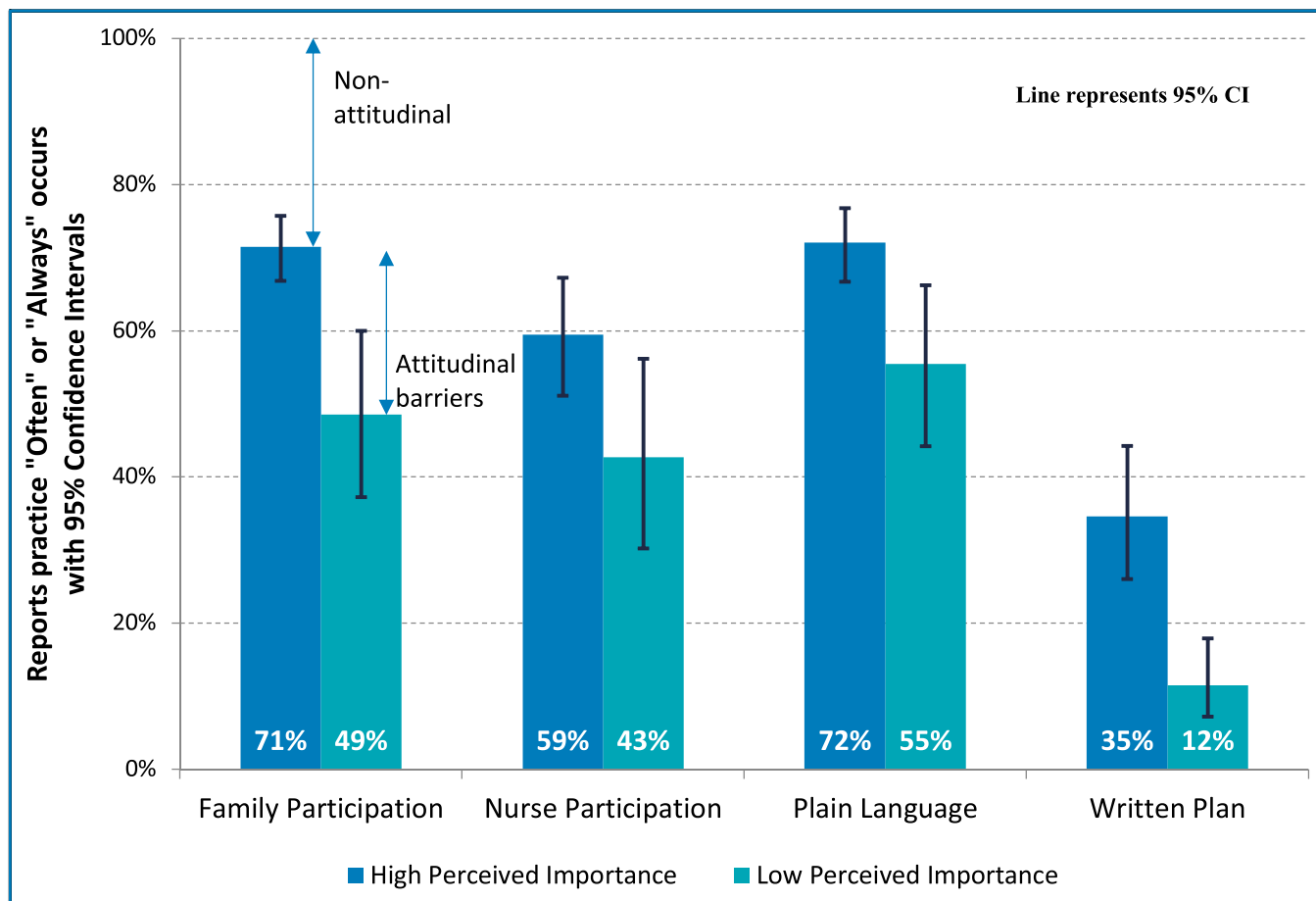


FIGURE 3 Clinician (nurse, resident physician, and attending-physician) self-reported practice occurrence of family-centered rounds. Elements by level of perceived importance for specific elements of FCR. Note that those with “High perceived importance” (those who believe an element of family-centered rounds is “very” or “extremely” important) are more likely to report in turn practicing a given family-centered rounds element than those with “low perceived importance” (those providers who did not believe an element of family-centered rounds was “very” or “extremely” important). The gap between those with “high perceived importance” and “low perceived importance” likely represents attitudinal barriers that may affect adherence to rounding elements. However, even among those with “high perceived importance,” the self-reported rate of that element “often” or “always” occurring is not 100%. This gap suggests the presence of non-attitudinal barriers (e.g., lack of availability of family or nurse). Those with “low perceived importance” may similarly have non-attitudinal barriers as well.

members, including families, who cannot be present at the bedside for FCR is an important coronavirus-19-related innovation that warrants additional study. Future areas of study include exploring factors to facilitate consistent engagement in FCR, and examining trainee teaching and learning on FCR.

Subjective and cultural norms may also influence participation in rounds. For instance, the attending physician has primary oversight for achieving the desired goals for FCR. Each attending physician's underlying attitudes and beliefs about FCR affect actions on rounds (e.g., adjusting rounds for nurse availability) with possible unintended repercussions (e.g., physicians who do not seek out nurse and family presence as mandatory to begin FCR may signal that their input is not valued).^{7,10,35,41-43} This negative reinforcement may lead to future lack of participation from family or nurse team members who may feel their input is not valued. Ensuring that attending physicians consistently prioritize family and nurse input on rounds by modeling necessary

adjustments to ensure availability (e.g., circling back to round when bedside nurse is available) and engagement (e.g., waiting for an interpreter so the family can participate) may positively influence resident beliefs and attitudes. Attending physicians can also be trained about how to maintain psychological safety for resident physicians while promoting family-centeredness and teaching on rounds. This can be achieved on a high level by institutional values that prioritize interprofessional coproduction, shared decision-making, and psychological safety.

To achieve standardized FCR that truly engages *all* team members, organizations must understand each team member's needs and the value of FCR to that member's workflow, and then demonstrate the benefit to patient safety and outcomes without negative impacts on other balancing measures like teaching, autonomy, and burnout. Hospitals must address staffing and logistical barriers that may impede staff's ability to participate in FCR. This may include initiatives such as scheduling rounds,

rounding at times mutually convenient for all stakeholders, assisting resident physicians with other tasks during rounds (e.g., through “physician extenders”), and building in additional learning opportunities throughout the day.

LIMITATIONS

This cross-sectional study was not designed to make direct, causal inferences between knowledge and beliefs/attitudes regarding FCR elements and adherence to FCR, patient safety, or effective communication. Survey questions, coproduced with family and nurse representative input and reviewed by resident physicians, were kept brief and may not assess the full breadth or depth of aspects such as participation, prioritization, or value of rounding elements. Survey methodology can be limiting due to recall and social desirability bias. Because this study was conducted at pediatric university-based and community-based teaching institutions and mainly with pediatric hospitalists, it limits generalizability. Other unmeasured confounders may explain our findings.

CONCLUSIONS

Although support for nurse and family participation in rounds is generally high, the degree of support varies by role, and actual practice varies substantially. Barriers to FCR include divergent beliefs/attitudes between physicians and nurses and families on the purpose of rounds. The gap in all team member groups between beliefs/attitudes and practice suggests that structural barriers exist that prevent a practice of FCR that is inclusive of nurse and family participation.

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CONFLICT OF INTEREST

Drs. Patel, Baird, Calaman, O'Toole, Landrigan, and Spector have served as consultants for the I-PASS Patient Safety Institute. Drs. Patel, Calaman and O'Toole, Landrigan, and Spector hold stock options in the I-PASS Patient Safety Institute. Dr. Srivastava is a physician and founder of the I-PASS Patient Safety Institute, his equity is owned by Intermountain Healthcare. In addition, he has received monetary awards, honoraria, and travel reimbursement from multiple academic and professional organizations for teaching and consulting on quality of care, healthcare systems spreading evidence-based best practices, and pediatric hospital

medicine. Dr. Landrigan has served as a consultant to the Midwest Lighting Institute to help study the effect of blue light on healthcare provider performance and safety. He has received consulting fees from the Missouri Hospital Association/Executive Speakers Bureau for consulting on I-PASS. In addition, he has received monetary awards, honoraria, and travel reimbursement from multiple academic and professional organizations for teaching and consulting on sleep deprivation, physician performance, handoffs, and safety, and has served as an expert witness in cases regarding patient safety and sleep deprivation. Dr. Spector has received honoraria and travel reimbursement for teaching and consulting with multiple academic institutions and professional organizations for work in professional development, leadership development, and I-PASS Study group activities. Dr. Knighton receives grant support from the Moore Foundation and the National Institutes of Health (NIH) not affiliated with this research. He owns shares in a large publicly traded health and wellness company and fees for his work as a venous thromboembolism guideline development methodologist for the American College of Chest Physicians, neither of which are associated with this work. The remaining authors declare no conflict of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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