

Interprofessional Shared Decision Making in the NICU: A Survey of an Interprofessional Healthcare Team

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Abstract

Background: The purpose of this study was to determine how different members of an interprofessional (IP) team (nurses, physicians, respiratory therapists, and other professionals) perceived collaboration and satisfaction with the decision-making process across three decision types (triage, chronic condition management, values-sensitive decisions) in a neonatal intensive care unit (NICU).

Methods and Findings: All members of the team at a tertiary NICU in Canada who consented to the study received a modified version of the Collaboration and Satisfaction about Care Decisions (CSACD) instrument. A total of 96 completed surveys were returned (response rate of 81.4%). Collaboration scores were calculated for each participant, professional group, and the IP team. The Pearson product-moment correlation coefficient was used to investigate the relationship between perceived collaboration about decision making and satisfaction with the decision-making process. Inter-group comparisons across different decision types were also calculated. The majority of statistically significant differences in professional perspectives about decision making were about triage decisions. Nurses and respiratory therapists were more likely than other groups to feel the decision-making process was inadequate. There was a strong, positive correlation between perceived collaboration in decision making, satisfaction with the decision-making process, and satisfaction with the decision.

Conclusions: Findings from this survey suggest that healthcare professionals' views differ about what constitutes optimum interprofessional shared decision making (IPSDM), and the decision type is an important influencing factor for IPSDM.

Keywords: Interprofessional; Shared decision making; Collaboration; Intensive care

Background

Interprofessional (IP) practice is a process by which professionals from different disciplines collaborate to provide an integrated and cohesive approach to patient care [1]. Shared decision making (SDM), a key component of IP practice [1], enables the separate and shared knowledge and skills of care providers to synergistically influence patient care provided [2].

Shared or collaborative decision making has been identified as an optimal model of treatment decision making [3]. Collaborative decision making in the intensive care unit (ICU) has been associated with lower rates of risk-adjusted mortality, higher levels of nurse and resident job satisfaction [4], and improved end-of-life care [5]. Poor decision-making processes have also been shown to contribute to the occurrence of critical incidents [6] whereas team member contributions during ICU patient decision-making rounds have been associated with a reduction in adverse event rates [7].

However, for successful outcomes to be achieved by IP teams, it is essential that all members communicate their unique perspectives and knowledge, and that their contributions are understandable to the other members of the team [8].

A systematic review, consisting of 28 studies from 10 countries, explored the barriers and facilitators to implementing SDM in clinical practice and found that little is known about SDM from the perspective of health professionals other than physicians [9]. Another realist review completed for this study, which included 15 studies from four countries, explored the processes of shared decision making in intensive care. Findings primarily addressed nurse and physician interactions about ethical decision making and barriers to interprofessional shared decision making (IPSDM). No studies explored this concept from the perspective of the full team or as related to different types of decisions.

The purpose of this study was to determine how different members of an IP team of nurses, physicians, respiratory therapists, and other professionals perceived collaboration and satisfaction with the decision-making process in a neonatal intensive care unit (NICU) across three decision types: triage, chronic condition management, and values-sensitive decisions. Triage decisions were defined as decisions for health problems requiring alternate levels of professional care or expertise, for example, emergency response and transfer to level III NICU or need for cardiology or surgical services. Chronic condition management decisions were defined as those decisions necessary to manage critically ill infants with complex care needs, for example, use of inotropes, nutrition, and respiratory support or sepsis/immune system issues. Values-sensitive decisions were defined as those decisions with two or more options that require families and the IP team to consider their values associated with the benefits and harms related to each option, for example, resuscitation, initiation of treatment, surgical interventions, and withdrawal of care or palliation. These decision types were selected because they represent three very different patient situations for which decisions are made in an NICU. Comparison across decision types helped to clarify whether IPSDM happens for all decisions or in only certain situations.

Methods

Conceptual framework

The Shared Decision Making and Health Care Team Effectiveness Model, developed for this study, is based on concepts from a recent systematic review of the healthcare team effectiveness literature [10] and a decisional conflict framework [11]. This model illustrates the relationships among components of IP practice, clinical decision making, team effectiveness, and healthcare outcomes. The central portion of this model depicts the IPSDM process that occurs among members of an IP team and other participants (e.g., the patient, family, or surrogate decision makers). According to this model, factors that affect decision making include the participants involved in the decision, the nature of the decision (decision type, difficulty, and urgency), uncertainty inherent in the nature of the decision (complexity of the decision and availability of evidence), individual decisional conflict, IP decisional conflict, and degree of

agreement among participants in the SDM process. During the process of shared decision making within an IP team, decisional conflict is not simply an individual issue for each participant (including patient, family, and healthcare provider); depending on the decision to be made, it may also be an issue across professional groups when there is a struggle to come to agreement about different options.

Study setting and sample population

This study took place in a Canadian tertiary care NICU that provides complex care to approximately 300 infants per year requiring specialist care. The members of the IP healthcare team in this unit included nurses, physicians, respiratory therapists, pharmacists, occupational and physiotherapists, dieticians, and social workers.

Procedure

Ethical approval was received from the Research Ethics Boards at the participating hospital and the local university. Key stakeholders and managers of the NICU were approached to ascertain their interest in the project. The medical and nursing directors of the NICU were provided with an information letter about the study, which was then circulated to the IP team and posted in the NICU. Information sessions for all staff were also provided, to answer questions and address concerns.

Following the information sessions, all members of the IP team working in the NICU were sent a copy of the information sheet and consent form and a copy of the Collaboration and Satisfaction about Care Decisions (CSACD) instrument [12] via internal mail. All members of the team were invited to participate in the survey to ensure broad representation. To ensure the confidentiality of participants' identities, surveys were numbered and a sealed ballot box was provided in the NICU for returned surveys. Two email reminders were sent to the team at weekly intervals beginning two weeks after the questionnaires were distributed using a modified Dillman process [13]. Completion of the survey was used as an indication of implied consent to participate in this phase of the study.

The CSACD is a valid and reliable instrument [12] that was originally designed to measure nurse-physician collaboration in making specific patient care decisions in an intensive care unit (ICU). The instrument consists of nine items. The first six items measure critical attributes of collaboration (i.e., planning together, open communication, shared responsibility, cooperation, consideration of concerns, and coordination) that are scored from 1 (strongly disagree) to 7 (strongly agree) on a Likert-type scale. The seventh question is a global measure of collaboration scored from 1 (no collaboration) to 7 (complete collaboration). The last two items measure satisfaction with the decision-making process and the decision and are scored from 1 (not satisfied) to 7 (very satisfied). A seven-point scale was chosen by the developers because it offered enough choice to provide variance in responses [12]. The total possible collaboration score (questions 1–7) is 7 to 49, with a higher score indicating more collaboration in the decision-making process.

Content validity for the collaboration scale is supported by the scale's development from a literature review [14] and by review of the questions by nursing and

medical experts in collaborative practice [15]. Criterion validity is supported through correlation of the global collaboration question with the six critical attribute items (correlation coefficient of .87) [12–16]. Reliability and construct validity have been demonstrated in a pilot study ($n = 58$) [12]. Cronbach's alpha (a measure of the internal consistency and reliability of the instrument) was reported to be .98 in a nursing sample and .93 for the medical residents for the six critical attributes of collaboration [15–16]. Construct validity was supported by a principal factor analysis, which produced a two-factor solution (one for collaboration and one for satisfaction [12–15]). The six critical-attribute collaboration items explained 75% of the variance in collaboration. The Eigenvalue for the collaboration factor was 4.5. Factor loading for the six items ranged from 0.82 to 0.93 [12–16].

Minor modifications were made to the original instrument (with permission) for use with an IP team in an NICU. The instrument was also formatted to address three different clinical decision types: triage decisions, chronic condition decisions, and values-sensitive decisions [17].

Analysis

Descriptive statistics (frequencies, means, and percentages) were generated to describe the characteristics of the study sample group, perceptions about IP collaboration, and satisfaction about healthcare decisions. A collaboration score was calculated for each participant by adding his/her individual responses for questions 1 through 7. Mean collaboration scores for each professional group and the IP team as a whole were also calculated. The Pearson product-moment correlation coefficient was used to investigate the relationship between collaboration about decision making (Q1–7), satisfaction with the decision-making process (Q8), and satisfaction with the decision (Q9). Inter-group comparisons of collaboration for different types of decisions (triage, chronic condition management, and values-sensitive decisions) were also conducted.

Analysis of variance (ANOVA) was chosen to measure differences among groups in this study. A post hoc analysis with Scheffe pairwise comparison procedure was used to determine if there were differences among groups. The criterion for significance was set *a priori* at $\alpha = .05$. The Scheffe post hoc test is customarily used with unequal sample sizes, which was the case with this data set [18]. Analyses were completed separately for each decision type. Since this was an exploratory and not a confirmatory study, no other adjustments for multiple testing were required [19].

Results

Characteristics of the sample group

The collaboration survey was distributed to 118 members of the NICU IP team. A total of 96 completed surveys were returned, giving an overall response rate of 81.4% (nurses (RN), $n = 68/85$, RR = 80%; physicians (MD), $n = 13/15$, RR = 86.7%; respiratory therapists (RT), $n = 8/11$, RR = 72.7%; other health professionals (OHP), $n = 7/7$, RR = 100%). Although the majority of participants were nurses (70.8%),

other key members of the IP team were also represented (MD = 13.5%; RT = 8.3%; OHP = 7.3%). The majority of participants were female ($n = 86, 89.6\%$), with university education ($n = 61, 62.3\%$) and extensive experience in both their professional roles (> 15 years experience, $n = 53, 55.2\%$) and work in NICU (> 15 years experience, $n = 41, 42.7\%$). Most participants worked either days or a combination of days and nights ($n = 84, 87.5\%$). These results reflected the total population of healthcare professionals working in the NICU. Detailed demographic and professional information is presented in Table 1.

Table 1: Participant distribution

Category		Frequency	Percent
Professional Group	Nurse	68	70.8
	Physician	13	13.5
	Respiratory Therapist	8	8.3
	Other Health Professional	7	7.3
	Total	96	100.0
	Missing	0	0
Gender	Male	10	10.4
	Female	86	89.6
	Total	96	100
	Missing	0	0
Education Completed	College Diploma	30	31.2
	University - Undergraduate Degree	31	32.3
	University – Graduate Degree	30	30
	Other	2	2.1
	Total	93	96.9
	Missing	3	3.1
Work Experience	Less than 1 year	2	2.1
	1-2 years	10	10.4
	3-5 years	10	10.4
	6-10 years	14	14.6
	11-15 years	5	5.2
	More than 15 years	53	55.2
	Total	94	97.9
	Missing	2	2.1
Work in NICU	Less than 1 year	8	8.3
	1-2 years	9	9.4
	3-5 years	14	14.6
	6-10 years	15	15.6
	11-15 years	6	6.2
	More than 15 years	41	42.7
	Total	93	96.9
	Missing	3	3.1
Work Schedule	Permanent days	19	19.8
	Permanent nights	8	8.3
	Combination of days and nights	65	67.7
	Total	92	95.8
	Missing	4	4.2

Characteristics of the collaboration and satisfaction scores

Professional group mean collaboration scores varied from a low score of 21.88 (RT – for triage decisions) to a high score of 41.67 (OHP – for chronic condition decisions). The team's mean collaboration score was lowest for triage decisions (31.23 out of 49, $SD = 7.82$). The team's mean collaboration score for values-sensitive decisions was slightly higher (31.41 out of 49, $SD = 8.08$), and perceived collaboration around decision making for chronic condition decisions was highest (33.73 out of 49, $SD = 7.12$). These scores fell just above the middle score (28) of the possible range (7–49) for satisfaction. This suggests that the team as a whole perceived the extent of collaboration around decision making in this NICU was less than it could be (Table 2).

Mean values for reports of satisfaction with the decision-making process (Q8) were all above the median score (4) of the possible range (1–7) for satisfaction, except for respiratory therapists' rating for triage decision making ($M = 3.38$). Physicians and other health professionals were consistently more satisfied with the decision-making process than nurses and respiratory therapists (triage decisions, $p = .001$; chronic condition decisions, $p < .001$; values-sensitive decisions, $p = .002$) (Table 3).

Mean values for reports of satisfaction with the decisions made (Q9) were above the median score (4) of the possible range (1–7) for satisfaction for all groups and all decision types. Mean scores for satisfaction with the decision were highest for triage decisions; values-sensitive decisions rated the lowest (Table 3).

Collaboration in decision making and satisfaction with the decision-making process were highly correlated [20] for nurses across all decision types (triage, $r = .742$, $p < .01$; chronic condition, $r = .807$, $p < .01$; values sensitive, $r = .849$, $p < .01$) and for physicians related to chronic condition ($r = .735$, $p < .01$) and values-sensitive ($r = .554$, $p < .05$) decisions. The relationship between variables was also strong [20] for respiratory therapists with respect to chronic condition decisions ($r = .825$, $p < .05$). In addition, there was a strong correlation between collaboration in decision making and satisfaction with the decision-making process for other health professionals with respect to values-sensitive decisions ($r = .942$, $p < .01$) (Table 4). Cronbach's alpha (a measure of the internal consistency and reliability of the instrument) was .94 for the six critical attributes of collaboration across all sample groups in this study.

Collaboration in decision making and satisfaction with the decision itself was also highly correlated [20] (but to a lesser extent) for nurses across all decision types (triage, $r = .509$, $p < .01$; chronic condition, $r = .681$, $p < .01$; values sensitive, $r = .669$, $p < .01$) and for physicians related to chronic condition ($r = .643$, $p < .05$) decisions. The relationship between variables was also strong [20] for respiratory therapists with respect to chronic condition decisions ($r = .749$, $p < .05$). In addition, there was a strong correlation between collaboration in decision making and satisfaction with the decision for other health professionals with respect to values-sensitive decisions ($r = .896$, $p < .01$) (Table 4).

Satisfaction with the decision-making process and satisfaction with the decision were highly correlated [20] for nurses across all decision types (triage, $r = .641$, $p < .01$; chronic condition, $r = .646$, $p < .01$; values sensitive, $r = .592$, $p < .01$) and for physicians

Table 2: Professional group and team mean collaboration scores (questions 1-7 CSACD)

Decision Type	Triage Decisions						Chronic Condition Decisions						Values Sensitive Decisions					
	Mean	SD	Range	n	95% CI		Mean	SD	Range	n	95% CI		Mean	SD	Range	n	95% CI	
Group																		
RN	31.26	6.89	14-43	67	29.61-32.91		32.26	6.70	14-45	66	30.64- 33.88		29.55	7.18	10-44	66	27.82-31.28	
MD	33.92	8.18	23-46	12	29.29-38.55		38.69	6.14	27-49	13	35.35-42.03		38.77	6.46	26-47	13	35.26-42.28	
RT	21.88	7.77	9-34	8	16.50-27.26		31.88	7.32	20-41	8	26.81-36.95		30.50	5.35	20-37	8	26.79-34.21	
OH	41.25	2.99	38-45	4	38.32-44.18		41.67	3.39	38-47	6	38.96-44.38		36.29	7.04	26-43	7	31.07-41.51	
Mean Team Score	31.23	7.82	9-46	91	29.62-32.84		33.73	7.12	14-49	93	32.28-35.18		31.41	8.08	10-47	94	29.78-33.04	

Note: RN = nurses; MD=physicians; RT=respiratory therapists; OH=other health professionals. Collaboration Scores = sum of questions 1-7 CSACD Instrument (total possible score 7-49)

Table 3: Interprofessional collaboration about patient care decision making across three decision types

Decision Type	Triage				Chronic Condition				Values Sensitive			
	n	Mean	95% CI	Sig	n	Mean	95% CI	Sig	n	Mean	95% CI	Sig
Q1: Plan together												
Nurse	68	4.42	4.09-4.75		67	4.57	4.29-4.84		67	3.93	3.58-4.29	
Physician	13	4.77	3.95-5.59		13	5.69	5.24-6.15		13	5.54	4.95-6.12	
Respiratory Therapist	8	2.50	1.32-3.68		8	4.50	2.89-6.11		8	4.62	3.29-5.96	
Other Health Prof	5	6.20	5.64-6.76		6	6.33	5.79-6.88		7	5.29	4.41-6.17	
Total	94	4.40	4.09-4.71	<.001	94	4.83	4.57-5.09	<.001	95	4.31	4.01-4.62	.001
Q2: Open communication takes place												
Nurse	68	4.91	4.61-5.21		67	5.00	4.71-5.29		67	4.51	4.22-4.81	
Physician	13	5.54	4.81-6.26		13	6.00	5.40-6.60		13	5.85	5.03-6.66	
Respiratory Therapist	8	3.12	2.18-4.07		8	4.62	3.74-5.51		8	4.62	3.86-5.39	
Other Health Prof	4	6.50	5.58-7.42		6	6.33	5.79-6.88		7	5.43	4.38-6.48	
Total	93	4.91	4.63-5.19	<.001	94	5.19	4.94-5.44	.002	95	4.77	4.51-5.04	.003
Q3: Responsibilities are shared												
Nurse	68	4.33	4.00-4.66		67	4.57	4.26-4.87		66	4.15	3.83-4.47	
Physician	13	4.69	3.94-5.45		13	4.77	3.98-5.56		13	4.69	3.90-5.49	
Respiratory Therapist	8	3.25	2.18-4.32		8	4.62	3.54-5.71		8	4.75	3.88-5.62	
Other Health Prof	5	5.00	3.48-6.52		6	5.67	4.23-7.10		7	4.86	3.73-5.98	
Total	94	4.32	4.04-4.60	.067	94	4.67	4.41-4.93	.242	94	4.33	4.07-4.59	.232
Q4: Cooperate together												
Nurse	68	4.63	4.35-4.91		67	4.71	4.45-4.97		67	4.35	4.05-4.65	
Physician	13	4.69	3.69-5.69		13	5.92	5.40-6.44		13	5.77	5.16-6.38	
Respiratory Therapist	8	3.38	1.97-4.78		8	4.75	3.88-5.62		8	4.12	3.43-4.82	
Other Health Prof	5	6.00	5.12-6.88		6	6.17	5.74-6.60		7	5.29	4.41-6.17	
Total	94	4.61	4.33-4.88	.005	94	4.97	4.74-5.20	<.001	95	4.59	4.34-4.85	<.001
Q5: Concerns are considered												
Nurse	68	4.29	4.01-4.56		67	4.47	4.15-4.79		67	4.13	3.78-4.48	
Physician	12	5.17	3.99-6.34		13	5.77	5.21-6.33		13	5.92	5.16-6.68	
Respiratory Therapist	8	3.25	2.01-4.49		8	4.38	3.29-5.46		8	4.00	3.00-5.00	
Other Health Prof	5	6.00	5.12-6.88		6	6.17	5.38-6.96		7	5.43	4.38-6.48	
Total	93	4.40	4.12-4.69	<.001	94	4.75	4.47-5.03	<.001	95	4.46	4.15-4.77	<.001
Q6: Decision-making is coordinated												
Nurse	67	4.29	4.02-4.57		66	4.45	4.15-4.75		67	4.31	3.96-4.65	
Physician	13	4.62	3.67-5.56		13	5.23	4.48-5.98		13	5.46	4.83-6.10	
Respiratory Therapist	8	2.88	1.83-3.92		8	4.25	3.28-5.22		8	4.12	2.83-5.42	
Other Health Prof	5	5.20	4.16-6.24		6	5.50	4.93-6.07		7	5.00	3.93-6.07	
Total	93	4.26	4.00-4.52	.003	93	4.61	4.36-4.86	.036	95	4.50	4.21-4.79	.029
Q7: Collaboration occurs												
Nurse	67	4.43	4.16-4.69		66	4.52	4.25-4.80		67	4.34	4.05-4.62	
Physician	13	4.77	3.87-5.66		13	5.31	4.59-6.02		13	5.54	4.95-6.12	
Respiratory Therapist	8	3.50	2.09-4.91		8	4.75	3.78-5.72		8	4.25	3.38-5.12	
Other Health Prof	5	5.20	4.16-6.24		6	5.50	4.93-6.07		7	5.00	3.81-6.19	
Total	93	4.44	4.18-4.69	.051	93	4.72	4.48-4.95	.040	95	4.54	4.29-4.79	.006
Q8: Satisfied with the decision making process												
Nurse	67	4.50	4.18-4.82		66	4.22	3.88-4.56		66	4.08	3.74-4.43	
Physician	13	5.38	4.75-6.02		13	5.69	4.94-6.45		13	5.69	4.86-6.52	
Respiratory Therapist	8	3.38	2.49-4.26		8	4.75	3.88-5.62		8	4.50	3.61-5.39	
Other Health Prof	5	5.80	4.44-7.16		6	6.17	5.38-6.96		7	5.14	3.59-6.69	
Total	93	4.60	4.32-4.87	.001	93	4.60	4.30-4.90	<.001	94	4.42	4.11-4.73	.002
Q9: Satisfied with decisions												
Nurse	67	4.89	4.60-5.18		66	4.69	4.42-4.96		67	4.44	4.10-4.78	
Physician	13	5.46	4.99-5.93		13	5.62	4.98-6.25		13	5.62	4.98-6.25	
Respiratory Therapist	8	4.38	3.38-5.37		8	4.50	3.73-5.27		8	4.50	3.87-5.13	
Other Health Prof	5	5.60	4.49-6.71		6	5.83	5.40-6.26		7	5.29	4.13-6.45	
Total	93	4.96	4.72-5.20	.097	93	4.88	4.65-5.11	.004	95	4.67	4.39-4.95	.019

Table 4: Correlations (Pearson r) between total collaboration score (Q 1-7), satisfaction with the decision-making process (Q8), and satisfaction with the decision (Q9)

Decision Type	Triage Decisions	95% CI	Chronic Condition Decisions	95% CI	Values Sensitive Decisions	95% CI
Group	Correlations between total collaboration score (Q 1-7) and satisfaction with the decision-making process (Q8)					
RN	.742** (n=67)	0.561-0.855	.807** (n=66)	0.661-0.894	.849** (n=66)	0.730-0.918
MD	.281 (n=12)	-0.349-0.736	.735** (n=13)	0.125-0.941	.554* (n=13)	0.005-0.846
RT	.700 (n=8)	-0.009-0.940	.825* (n=8)	0.288-0.967	.425 (n=8)	-0.399-0.869
OH	.837 (n=4)	-0.634-0.996	.262 (n=6)	-0.697-0.885	.942** (n=7)	0.437-0.995
Group	Correlations between total collaboration score (Q 1-7) and satisfaction with the decision (Q9)					
RN	.509** (n=67)	0.235-0.708	.681** (n=66)	0.468-0.819	.669** (n=66)	0.450-0.812
MD	.397 (n=12)	-0.229-0.790	.643* (n=13)	0.143-0.881	.517 (n=13)	-0.047-0.831
RT	.501 (n=8)	-0.314-0.891	.749* (n=8)	0.094-0.951	.071 (n=8)	-0.667-0.738
OH	- ^a (n=4)	-	.386 (n=6)	-0.619-0.911	.896** (n=7)	0.163-0.991
Group	Correlations between satisfaction with the decision making process (Q8) and satisfaction with the decision (Q9)					
RN	.641** (n=67)	0.412-0.793	.646** (n=66)	0.417-0.797	.592** (n=66)	0.342-0.763
MD	.688** (n=13)	0.03-0.930	.795** (n=13)	0.264-0.956	.896** (n=13)	0.563-0.978
RT	.553 (n=8)	-0.248-0.905	.745* (n=8)	0.085-0.95	.707* (n=8)	0.005-0.942
OH	.919* (n=5)	0.195-0.994	.759 (n=6)	-0.136-0.971	.929** (n=7)	0.348-0.994

Notes: RN = nurses; MD=physicians; RT=respiratory therapists; OH=other health professionals.
 ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed);
^a Cannot be computed because at least one of the variables is constant;
 Guidelines for Interpretation (Cohen, 1988):
 r=.10 to .29 small (weak)
 r=.30 to .49 medium
 r=.50 to 1.0 large (strong)

across all decision types (triage, $r = .688, p < .01$; chronic condition, $r = .795, p < .01$; values sensitive, $r = .896, p < .01$). The relationship between variables was also strong [20] for respiratory therapists with respect to chronic condition decisions ($r = .745, p < .05$) and values-sensitive decisions ($r = .707, p < .05$). In addition, there was a strong correlation between satisfaction with the decision-making process and satisfaction with the decision for other health professionals with respect to triage decisions ($r = .919, p < .05$) and values-sensitive decisions ($r = .929, p < .01$) (Table 4).

One-way ANOVA

A one-way ANOVA was carried out to compare perceptions across different types of decisions (triage, chronic condition management, and values-sensitive decisions) and professional groups. Results indicated statistically significant differences across professional groups. Results are summarized in Table 3.

The majority of statistically significant differences in professional perspectives on decision making were about triage decisions. Although nurses reported that two aspects of the decision-making process—planning and consideration of concerns—were not optimal, respiratory therapists were most discontented with five elements of the decision-making process related to triage decisions: planning together, open communication, co-operating, consideration of concerns, and co-ordinated decision making. Despite being significantly less satisfied with the shared decision-making process than physicians and other health professionals, respiratory therapists were not dissatisfied with the decisions that were made.

There were fewer statistically significant differences across professional groups for chronic condition decisions. The issues within this category were primarily due to nursing discontent with four aspects of the decision-making process: planning, open communication, co-operating, and consideration of concerns. In addition, nurses were significantly less satisfied with the shared decision making-process than physicians and other health professionals, and they were significantly less satisfied than physicians with the actual decisions made. Respiratory therapists were also significantly less likely than other health professionals to feel members of the IP team in NICU plan together to make decisions about patient care.

The fewest statistically significant differences across professional groups were found with values-sensitive decisions. The issues that existed primarily revolved around differences in opinions between nurses and physicians. All aspects of the decision-making process were of issue except shared responsibilities and co-ordination of patient care planning. Nurses were also less likely than physicians to be satisfied with the decision-making process and the decisions made in the NICU. Respiratory therapists were significantly less likely than physicians to feel that members of the IP team co-operate to share in the decision-making process and consider concerns from all members of the IP team when making decisions about patient care.

Discussion of results

The findings of this survey are clinically relevant in that some members of the IP team, primarily respiratory therapists and nurses, reported shared decision making

for triage, chronic condition, or values-sensitive decisions is less than optimal. The factors underlying this discontent are associated with key components of a shared decision-making process (e.g., planning, communication, sharing information, and consideration of concerns). Nurses' collaboration scores were relatively stable across all decision types. Respiratory therapists' collaboration scores were lower than the physicians' across all decision types. Physicians' collaboration scores were consistently higher than those of nurses or respiratory therapists, and they were more satisfied with the decision-making process. An earlier study about nurse/physician collaboration in an ICU reported similar results [21]. Nurses and respiratory therapists were more likely than other groups to feel the decision-making process was inadequate.

According to McCloskey and Mass [8], for successful patient outcomes to be achieved by IP teams, it is essential that all members of the team communicate their perspectives and knowledge, and that their contributions are understandable and valued by the other members of the team. In contrast to this view, the results of this survey suggest that variability in the quality of the decision process exists, and the disconnect expressed by members of the IP team may not only decrease professional satisfaction but may result in decisions being made without all the facts.

There was a strong positive correlation, defined as $r = .50-1.0$ [20], between perceived collaboration in decision making and satisfaction with the decision-making process, with high levels of satisfaction with the decision-making process associated with higher levels of perceived collaboration in decision making (Table 4). However, this association was smaller for physicians than for nurses (consistent with other studies [15,21,22]) and respiratory therapists. Consistent with other literature, this result supports the concept that nurses and respiratory therapists may value collaboration in decision making more than physicians do [22,23] and that physicians see their own input as most important to a good decision. The relationship between variables was also strong [20] for respiratory therapists ($r = .700$) with respect to triage decisions, although these relationships did not reach statistical significance, probably due to small sample sizes in the groups (Table 4).

The higher the collaboration score the more satisfied nurses were with the decision-making process for all decision types. This same trend was seen for physicians with respect to chronic condition and values-sensitive decisions, and for respiratory therapists with respect to chronic condition decisions. These findings suggest decision type is a factor in perceived satisfaction with the decision-making process. Consistent with the above findings, the correlation between satisfaction with the decision-making process and with the decision itself was strong for different decision types for some professional groups, suggesting that both collaboration and the decision being made are critical to perceived satisfaction with the process of decision making.

Levels of collaboration during the decision-making process are influenced by the severity of patient conditions. Some physicians believe that they are the primary decision makers and do not need to collaborate with others [24]. Traditionally, the ultimate decision maker in intensive care is the physician [25]. Team communication processes tend to be more democratic and decisions are made after input from

all team members when patient illnesses are well understood [26]. However, for more complicated patients, senior physicians tend to make key decisions autocratically [26]. Shared decision making depends on the willingness of the physician leader to listen, share decision making, and support collaborative structures (e.g., rounds) as a way to facilitate care co-ordination [27]. Although the physician group in this study reported that the IP team was very collaborative in decision making, this view was not shared by other members of the team, emphasizing the importance of clarifying roles, responsibilities, and processes during IPSDM to ensure optimal decision making and quality decisions.

Another explanation for the different views found during this survey might be that nurses, physicians, and respiratory therapists may define and interpret collaboration and the process of shared decision making differently. Differences in power, roles, and responsibilities within a unit can lead practitioners to have different perceptions about whether events are collaborative or not [28].

The professional viewpoints found in the survey may also be due to differing perspectives about which decision types are conducive to IPSDM. It appears that a more collaborative approach is perceived to be the norm when it comes to values-sensitive decisions than with triage and chronic condition decision making. This approach may be related to people believing there is little time during triage decision making to discuss issues in any depth, and chronic condition management tends to require more input from other health professionals, increasing the deliberations and time required for decision making.

Being receptive, having respect and trust for other professions, and being willing to consider different perspectives is critical to the success of a shared decision-making process [28]. Infants with respiratory problems requiring ventilator support are common in the NICU. Respiratory therapists have special expertise and play an essential role in triage decision making related to the management of respiratory problems and ventilator support in the NICU. In addition, nurses believe they bring a unique perspective to the team discussions; however, they often feel their contribution is undervalued and their voice is not heard [29]. Therefore, if respiratory therapists and nurses feel their perspective is not included in decision making, they may feel disenfranchised from the process. Other healthcare providers have a more limited focus and therefore many not see themselves as needing to be involved in triage decision making, for example. They participate on an as-needed basis rather than continuously, even though they may attend daily decision-making rounds.

The perception of ownership and the process of trade of commodities are mechanisms by which team collaboration is achieved or undermined in complex, high-pressure settings [30]. Recognition of others' possession of knowledge and skills is part of the smooth collaborative functioning of the team. Individual ownership can create interdisciplinary tension when team members feel their ownership of particular knowledge and skills is not recognized (e.g., nurses' intimate knowledge of the patient or respiratory therapists' knowledge of ventilator management) [30]. When the issues of ownership and trade of commodities are not addressed, tensions accumulate and collaboration erodes [30]. Collective ownership of a commodity pro-

vides a foundation for group identity. It promotes collaboration between members of the team [30]. Ownership of commodities could explain the group variation in this study. Perhaps the respiratory therapists and nurses felt that their knowledge and skills were less valued by the team, while physicians and other health professionals perceived patient care to be collectively owned and knowledge and skills adequately shared to facilitate decision making. Further exploration is warranted.

Open communication and the ability to participate in discussions are essential for effective IPSDM in intensive care. In this study, lack of open communication was identified as an issue by respiratory therapists for triage decisions and by nurses for chronic condition and values-sensitive decisions. However, the factors contributing to the different perspectives are unclear. Other research has revealed that nurses find it difficult to speak up during decision making, and fewer nurses than physicians feel that disagreements in the ICU are properly resolved and that input from nurses about patient care is well received [31-32]. A recent systematic review conducted to develop a team performance framework for the intensive care unit identified three elements of communication as essential components of the team decision-making process: a) junior team members able to discuss decisions with team leader, b) input from junior team members being well received, and c) reduced discussion during emergencies and in situations of extreme pressure [32-33]. Further exploration is required to fully explain the communication issues in this NICU setting.

The results of this survey suggest a number of different processes may be at play during decision making for the three different decision types explored in this study. Triage decisions often involve rapid decision making with little time for discussion, which may limit opportunities for individuals to provide input or feel involved in the decision-making process. Although nurses and respiratory therapists are integrally involved in care during triage situations, their perception of involvement during triage decision making was less than optimal. Chronic condition decisions may involve more time for discussions and include all members of the team, but input was also perceived to be less than optimal, suggesting participation in the process of IPSDM was also compromised. Values-sensitive decision making, most traditionally associated with collaboration among members of the IP team and the family, was perceived to be less problematic but still highlighted differences in opinions between nurses and physicians. This suggests that IPSDM may not be perceived by all members of the IP team the same way, or that the processes used for IPSDM may need to be tailored to different decision types, clinical contexts, and professional groups, and therefore IPSDM may not be feasible for all decision types. Further exploration is needed to fully understand the processes of IPSDM, the barriers and facilitators to this approach to decision making with different decision types, and the reasons nurses and respiratory therapists feel the way they do about decision making. In-depth qualitative research through interviews, focus groups, and observations is required to explore professional perspectives about the process of IPSDM for different decision types, the meaning of IPSDM to different members of the IP team, the ways different professionals ensure their voices are heard during IPSDM, and the influence of power differentials on the process of IPSDM.

Despite disagreeing about most of the steps in the decision-making process, all groups seemed to be in agreement that responsibilities for patient care planning are shared. However, it is not clear from the results of this survey whether respondents feel that decision-making responsibilities are shared appropriately, equitably, or just some of the time.

Results from this survey indicate that: IPSDM involves planning, open communication, co-operation, shared responsibilities, consideration of concerns, co-ordination, and collaboration among members of the IP team; healthcare professionals' views differ about what constitutes optimum IPSDM; and nurses and respiratory therapists were more likely than other groups to feel the decision-making process was inadequate. Recognizing and understanding these results can help to improve the process of IPSDM.

Methodological issues and limitations

There are three potential limitations to this study: social desirability bias, generalizability of findings, and limitations of correlational research. Social desirability bias is a term used to describe the tendency of respondents to reply in a manner that will be viewed favorably by others. Care was taken during this study to ensure the confidentiality of participants' identities by using anonymous surveys, providing ballot boxes for returned surveys, and reporting aggregated results by professional group.

The goal of this study was to explore IPSDM in depth. Therefore, this survey was conducted in one NICU and the sample group was limited to those practitioners currently working in this unit (limiting numbers for some of the professional groups, e.g., respiratory therapy and other health professionals). In addition, the survey used limited descriptions for each of the three decision types presented to the participants (triage, chronic condition, and values-sensitive decisions). These factors may limit the generalizability of results. Replication of this study in different intensive care settings using vignettes of different decision types to provide participants with consistent cases on which to base their answers may strengthen the validity of results.

The other health professionals group answered fewer questions related to triage or chronic condition decisions than did the physicians, nurses, or respiratory therapists. It is not clear whether this is because they felt less involved in triage or chronic condition management decisions and therefore did not have an opinion, they just chose to not answer the question, or they skipped the first two sections to get to the values-sensitive questions that were of more relevance to their practice.

A final limitation of the study is related to examining the relations among many variables. Correlations between variables (collaboration during decision making, satisfaction with the decision-making process, and satisfaction with the decision) do not equal causation. While correlational studies can suggest there is a relationship between two variables, they do not prove that one variable causes a change in another variable. Other variables may play a role, including social relationships, cognitive abilities, personality, professional training, and other factors.

Despite these potential limitations, a number of factors support the reliability and validity of the study findings. The data collection instrument was adapted from

a valid and reliable instrument (CSACD) [12] that has been used to measure collaboration and satisfaction about care decisions in intensive care settings. In addition, Cronbach's alpha (a measure of the internal consistency and reliability of the instrument) was .94 for the six critical attributes of collaboration across all sample groups in this study. The processes used for data collection were simple, transparent, and are reproducible. There was an excellent response rate and representation across all professional groups. In addition, the results demonstrated both statistically significant and clinically relevant differences between professional groups and across decision types.

Conclusions

This study explored perceptions about collaboration and satisfaction with the decision-making process across different professional groups and decision types in a NICU. There was significant variation in professional perspective about collaboration and satisfaction with the decision-making process in the NICU. Although limited to one NICU environment, the fact that approximately 82% of the IP healthcare team participated gives these findings substantial weight. However, the results from this study did not provide a complete picture of the processes involved in decision making among members of the IP team. Therefore, a qualitative study using interviews, focus groups, and observations for in-depth exploration of professional perspectives about the process of IPSDM is warranted.

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