Humanizing the intensive care unit experience in a comprehensive cancer center: A patient- and family-centered improvement study

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Original Article

Abstract

Objectives. Improving family-centered outcomes is a priority in oncologic critical care. As part of the Intensive Care Unit (ICU) Patient-Centered Outcomes Research Collaborative, we implemented patient- and family-centered initiatives in a comprehensive cancer center. **Methods.** A multidisciplinary team was created to implement the initiatives. We instituted an open visitation policy (OVP) that revamped the use of the two-way communication boards and enhanced the waiting room experience by hosting ICU family-centered events. To assess the initiatives' effects, we carried out pre-intervention (PRE) and post-intervention (POST) family/caregiver and ICU practitioner surveys. **Results.** A total of 159 (PRE = 79, POST = 80) family members and 147 (PRE = 95, POST = 52) ICU practitioners participated. Regarding the decision-making process, family members felt more included (40.5% vs. 68.8%, $p < 0.001$) and more supported (29.1% vs. 48.8%, $p = 0.011$) after the implementation of the initiatives. The caregivers also felt more control over the decision-making process in the POST survey (34.2% vs. 56.3%, $p = 0.005$). Although 33% of the ICU staff considered OVP was beneficial for the ICU, 41% disagreed and 26% were neutral. Only half of them responded that OVP was beneficial for patients and 63% agreed that OVP was beneficial for families. Half of the practitioners agreed that OVP resulted in additional work for staff. **Significance of results.** Our project effectively promoted patient- and family-centered care. The families expressed satisfaction with the communication of information and the decision-making process. However, the ICU staff felt that the initiatives increased their work load. Further research is needed to understand whether making this project universal or introducing additional novel practices would significantly benefit patients admitted to the ICU and their family.

Introduction

Caregivers of cancer patients suffer a profound impact on their well-being and quality of life (Girgis et al., 2013; Sun et al., 2019). Their emotional burden worsens when their loved one is hospitalized and requires an intensive care unit (ICU) admission. Moreover, as the cancer population is at high risk of developing life-threatening events that require intensive care treatment (Wallace et al., 2016; Gutierrez et al., 2018; Cuenca et al., 2020), developing and enacting better family-centered care strategies for critically ill cancer patients is paramount. Increasing family engagement has been associated with a shorter ICU stay (Lee et al., 2019), decreased cardio-circulatory complications (Fumagalli et al., 2006), and reduced patient falls (Dupree et al., 2014) without increasing infection rates or adverse events (Adams et al., 2011; Bishop et al., 2013).

Historically, ICUs have maintained strict policies about visitation and family-centered care (Liu et al., 2013). However, the belief that patients in the ICU benefit from restricted visitation has been contradicted by evidence that social isolation can increase morbidity and mortality (Cacioppo et al., 2011). The COVID-19 pandemic has highlighted the various deleterious psychological effects that prohibiting visitation can generate in patients, families, and healthcare providers (Azoulay et al., 2021). The Guidelines for Family-Centered Care in the Neonatal, Pediatric, and Adult ICU suggest that family members of critically ill patients be "offered open or flexible family presence at the bedside" (Davidson et al., 2017). Despite this, hospitals' visitation policies in their ICUs still vary widely (Liu et al., 2013). Strict visitation policies cause the families to stay mainly in the ICU waiting room, making them feel less engaged with the care of their loved one (Davidson et al., 2017). For these reasons, waiting rooms should be a place of comfort with nearby restrooms and places to eat, and should post easily read signage to help family members navigate around (Deitrick et al., 2005; Karlsson et al., 2011).

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To enhance the ICU family engagement and overall satisfaction of care by patients and their families, we participated in a national performance improvement study called the Patient-Centered Outcomes Research (PCOR) Collaborative (Kleinpell et al., 2019). We implemented multilevel patient- and family-centered initiatives that were focused on (1) applying an open visitation policy (OVP), (2) using daily two-way communication boards, and (3) enhancing the ICU waiting room experience. Here, we report the perspectives of both the families and the ICU practitioners on these performance improvement initiatives.

Methods

Study design and setting

This "before and after" performance improvement multilevel intervention study was approved by the Qualitative Institutional Review Board and was conducted in the 34-bed medical and 18-bed surgical ICUs at the University of Texas MD Anderson Cancer Center. A multidisciplinary workgroup consisting of physicians, nurses, advanced practice providers, pharmacists, physical therapists, occupational therapists, dieticians, patient educators, patient advocates, chaplains, social workers, ethicists, and volunteer services was formed. The workgroup was involved in planning, addressing concerns, enabling information dissemination, and implementing patient- and family-centered care initiatives. In order to achieve a substantial improvement in family-centered care, the team decided to execute multiple initiatives simultaneously in a multilevel fashion.

To be considered eligible to participate in the study, respondents must have been caregivers of a patient admitted to the ICU or a healthcare provider who primarily worked in the ICU. We conducted pre-intervention (PRE) and the post-intervention (POST) surveys for families of patients admitted to the ICU and for ICU practitioners. The PRE surveys were carried out 1 month before the implementation period. At the same time, the institution renovated the ICUs and waiting rooms following the SCCM ICU design guidelines (Thompson et al., 2012). After a 6-month implementation period, the POST surveys were conducted. Consequently, there were two separate groups of family members who responded to the surveys (Figure 1). Potential participants were approached by the research team, only those who were willing to participate in the study were offered the links to the survey. The web secure database REDCap was used to anonymously collect and store all the survey data.

Initiatives

Open visitation policy

A visitor pass system was implemented that allowed each family to have two passes to the ICU. One was a 24-h pass, allowing one family member to stay in the patient's room at any time during the day or night. The second pass allowed a second family member to be in the patient's room between 10:00 AM and 10:00 PM.

Two-way communication boards

We implemented this initiative early to optimize communication between patients, families, and caregivers. Daily goals were established for every patient during multidisciplinary rounds in the morning. Nurses updated the daily goals board with a minimum of two to three goals to be accomplished for the day, and subsequently, with a multidisciplinary approach, the ICU team addressed the goals with patients and families. Audits were performed daily to identify and overcome potential barriers. Patients and families were encouraged to write questions or concerns to the ICU team on the board.

Enhanced waiting room experience

We worked with volunteer services to provide therapeutic coloring books and daily coffee services to the waiting room. A comprehensive calendar was created to inform that family members of events could participate in free of charge. We held events such as ICU family celebrations, card-making sessions, and holiday music therapy sessions directed by a certified music therapist. The calendar also included MD Anderson's Integrative Medicine Program events such as yoga meditation, drumming sessions, Tai Chi, group singing, and cooking lessons.

Surveys

The PCOR collaborative leadership provided the surveys for this study (Kleinpell et al., 2019). The family/caregiver participants'
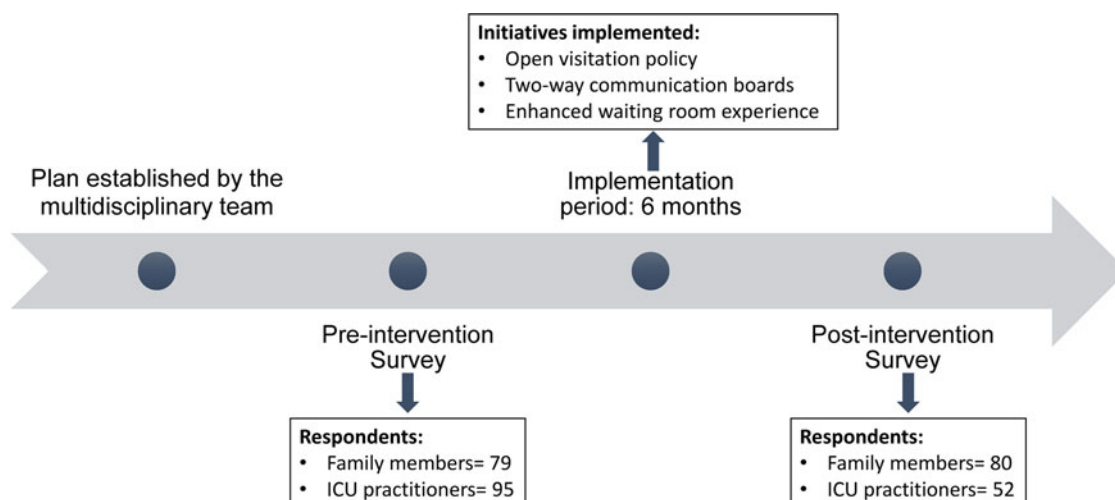

Fig. 1. Study schema.

surveys were based on the Family Satisfaction with Care in the ICU Survey (Wall et al., 2007), which has well-established reliability and validity (Kleinpell et al., 2019). The questions addressed demographic information, staff competence, treatment of family, communication, waiting area environment, and overall family satisfaction. The ICU practitioners responded to the Patient- and Family-Centered Adult Intensive Care: A Self-Assessment Inventory (A Self-Assessment Inventory, 2019). The questions inquired about demographics such as age, sex, ICU practitioner role, years of practice, experience in the ICU, personal and professional experience with family presence, and family-centered care integration. Additionally, both the caregivers' and practitioners' POST surveys also included specific questions evaluating the implemented local initiatives (Kleinpell et al., 2019). All surveys were based on a Likert scale.

Statistical analysis

Descriptive analyses were performed for patients' family and ICU practitioner demographics and responses. For categorical variables, counts and frequencies were reported. Frequencies were calculated based on the non-missing values. For continuous variables, mean and standard deviation were reported. Differences between the PRE and POST intervention surveys were calculated using the X^2 test. All statistical analyses were performed using the statistical software IBM SPPS Statistics for Windows, version 25 (SPSS Inc., Chicago, IL, USA).

Results

A total of 159 (PRE = 79 and POST = 80) family members completed the surveys. Table 1 describes the demographics and basic information of the participants. The families'/caregivers' roles included daughter (21%), wife (17%), son (13%), parent (8%), and husband (5%). "Others" involved extended family members (partner, brother, sister, and other) (18%). Almost half of the caregivers (50.9%) had previous experience caring for a family member in the ICU. Approximately 42% of the caregivers lived with the patients. A total of 147 (PRE = 95 and POST = 52) ICU practitioners participated in the surveys. Most of them were nurses (43%), followed by advanced practice providers (12%), clinical pharmacists (12%), physicians (9%), respiratory therapists (9%), and others such as occupational therapists, speech therapists, and dieticians (15%).

Family members' perspectives

Overall, in the 159 caregivers (PRE and POST combined), the "excellent" to "very good" response for "ease of getting information" was 72%. The "fair" to "poor" response was 8%. The "excellent" to "very good" responses for "understanding of information" were 74% and the "fair" to "poor" responses were 5%. Regarding their understanding of information, 74% of the participants rated it as "excellent" or "very good" and just 5% considered it "fair" or "poor". About 73% of caregivers responded "excellent" to "very good" with regard to the "completeness of information," indicating that most family members were satisfied with how well the information regarding their loved ones was conveyed to them by the care team. A much lower percentage of respondents (8%) reported that "completeness of information" was "fair" to "poor." Most (71%) of the families were satisfied with the "consistency of information," indicating that they received similar

Table 1. Demographics and basic information of the participants

Family members	PRE N = 79	%	POST N = 80	%
Age (years), Mean (SD)	47.98	(±15.23)	47.1	(±14.86)
Sex				
Female	54	68.35	48	60
Male	25	31.65	32	40
Relationship to patient				
Husband	6	7.59	3	3.75
Wife	21	26.58	6	7.5
Partner	1	1.27	1	1.25
Brother	5	6.33	9	11.25
Sister	4	5.06	8	10
Daughter	16	20.25	18	22.5
Son	8	10.13	12	15
Father	3	3.80	0	0
Mother	4	5.06	6	7.5
Other	11	13.92	17	21.25
Before this most recent event, have you been involved as a family member of a patient in an ICU?				
Yes	45	56.96	36	45
No	34	43.04	44	55
Do you live with the patient?				
Yes	38	48.1	28	35
No	41	51.9	52	65
ICU practitioners	PRE N = 95	%	POST N = 52	%
Age in years, Mean (SD)	38.86	(±10.54)	41.13	(±12.10)
Sex				
Female	74	77.89	37	71.15
Male	13	13.68	9	17.31
Prefer not to answer	8	8.42	6	11.54
Clinical role				
Advanced practice nurse	6	6.45	7	13.21
Nurse	40	43.01	28	52.83
Clinical pharmacist	11	11.83	3	5.66
Physician	8	8.6	9	16.98
Physician assistant	5	5.38	1	1.89
Occupational therapist	8	8.60	1	1.89
Other	17	16.13	3	7.55
Total years working in an ICU setting, Mean (SD)	9.28	(±8.08)	10.73	(±7.25)
Years working in the current ICU, Mean (SD)	6.06	(±5.67)	6.8	(±5.46)

ICU, intensive care unit.

messages from doctors and nurses, etc. A very small portion of relatives (9%) responded "fair" to "poor." About 59% of families responded "excellent" to "very good" about the "frequency with

which ICU doctors communicated information." A few families (15%) felt less satisfied, responding "fair" to "poor." The "excellent" to "good" response for family care and concern by ICU staff was 91%. The responses of the family members by PRE and POST are summarized in Table 2;. Overall, the "excellent" response rate increased from PRE to POST; however, none of the improvements were statistically significant.

Most of the relatives (80%) felt included in the decision-making process ("very" 55%, "somewhat included" 25%). Fewer relatives felt excluded (9%). There was a statistically significant increase in the rate of "very included" in the decision-making process from the PRE to POST ($p < 0.001$). A considerable number (78%) felt supported during the process, whereas 8% felt totally or somewhat overwhelmed. A significantly higher rate of participants felt very supported ($p = 0.011$) after the implementation of the initiatives. About half (45%) of the relatives believed that they had good control of the process, whereas 30% felt less in control, and just 9% felt that the process was somewhat or completely out of their control. The proportion of respondents who felt in control of the process in the POST survey was higher than in the PRE survey ($p = 0.005$). About 13% of the caregivers believed that they needed more time to make decisions or to discuss or address their concerns.

Caregivers' perspectives regarding the ICU waiting room areas, OVP, and daily goal boards are presented in Supplementary Table 1. Among the 159 caregivers (PRE and POST combined) who responded to the survey, 71% considered their satisfaction with the ICU waiting area environment to be "excellent" or "very good". Most respondents described access to the kitchen (69%), nutritious snacks (75%), and laundry facilities (77%) as "very well" to "ok." Regarding access to place for prayer or reflection, the majority (95%) reported "very well" to "ok" responses. Overall, the "excellent" and "very well" responses rate increased from PRE to POST; however, only access to kitchen facilities ($p < 0.001$) and nutritious snacks ($p = 0.008$) were statistically significant. In the POST survey, the families evaluated the OVP and daily board goals. Over half of the respondents knew that the visitation policies had relaxed recently (60.7%), most of them were satisfied with the OVP (89%) and believed that the OVP was helpful for them and their loved ones (87.6%). Likewise, the majority of the participants (77.4%) were aware of the use of the daily goal boards, liked it (81.9%), and agreed that it was helpful for them and their loved ones (81.9%).

ICU practitioners' perspectives

The ICU practitioners' perspectives regarding the initiatives are presented in Table 3. Among the 147 respondents (PRE and POST combined), 38% preferred an OVP in the ICU, whereas 42% were in disagreement, and 19% were neutral. Regarding communication with family, 42% of providers believed that the OVP improved it, while 31% disagreed. Almost a quarter of the practitioners (23%) thought that patient care was improved with OVP, whereas 37% disagreed and 40% were neutral. Although 33% responded that OVP was beneficial for the ICU, 41% disagreed and 26% were neutral. In addition, half of them responded that OVP was beneficial for patients, whereas 29% disagreed and 21% were neutral. Most (63%) practitioners agreed that OVP was beneficial for families despite over half of them (51%), believing that it could result in additional work for staff.

The use of the two-way communication boards was supported by 70% of the 147 responders, 26% were neutral, and only 4% were in disagreement. While almost half of the ICU practitioners

Table 2. Family members' perspectives on information dissemination and decision-making process

	PRE N = 79	%	POST N = 80	%
Ease of getting information				
Excellent	31	39.2	38	48.7
Very good	25	31.6	19	24.4
Good	14	17.7	17	21.8
Fair	8	10.1	3	3.8
Poor	1	1.3	1	1.3
N/A	0	–	2	–
Understanding of information				
Excellent	33	41.8	37	47.4
Very good	27	34.2	19	24.4
Good	15	19	18	23.1
Fair	4	5.1	3	3.8
Poor	0	0	1	1.3
N/A	0	–	2	–
Completeness of information				
Excellent	33	41.8	44	56.4
Very good	24	30.4	14	17.9
Good	15	19.0	14	17.9
Fair	7	8.9	4	5.1
Poor	0	0.0	2	2.6
N/A	0	–	2	–
Consistency of information				
Excellent	30	38.5	35	46.1
Very good	24	30.8	20	26.3
Good	17	21.8	14	18.4
Fair	6	7.7	6	7.9
Poor	1	1.3	1	1.3
N/A	1	–	4	–
Did you feel included in the decision-making process?				
Very included	32	40.5	55	68.8
Somewhat included	28	35.4	12	15
I felt neither included nor excluded	12	15.2	6	7.5
Somewhat excluded	3	3.8	4	5
Very excluded	4	5.1	3	3.8
Did you feel supported during the decision-making process?				
I felt very supported	23	29.1	39	48.8
I felt supported	35	44.3	27	33.8
I felt neither overwhelmed nor supported	15	19	8	10
I felt somewhat overwhelmed	4	5.1	5	6.3
I felt totally overwhelmed	2	2.5	1	1.3
Did you feel you had control over the care of your family member?				
I felt I had good control	27	34.2	45	56.3

(Continued)

Table 2. (*Continued.*)

	PRE N = 79	%	POST N = 80	%
I felt I had some control	28	35.4	20	25
I felt neither in control nor out of control	16	20.3	9	11.3
I felt somewhat out of control	5	6.3	4	5
I felt really out of control	3	3.8	2	2.5
Did you have adequate time to have your concern addressed and questions answered?				
I had adequate time	72	91.1	66	82.5
I could have used more time	7	8.9	14	17.5

N/A responses were excluded from the frequency calculations.
ICU, intensive care unit.

(47%) believed that the board improved communication with patients' families, only 23% disagreed. More than a third (35%) of the clinicians agreed that patient care improved; however, 65% were either neutral or in disagreement. Even though most of the responders believed it was beneficial for the unit (60%), the patients (61%), and the families (75%); a third agreed that the two-way communication boards created more work for the staff.

Discussion

Our findings suggest that the implementation of OPV, the two-way communication board, and a revamped waiting room experience enhanced communication and engagement between the family members/caregivers and the medical team. For instance, family members felt significantly more included and supported during the clinical decision-making process, which leads to a higher perception of control over medical decisions. Additionally, the three studied initiatives were well received by the family members. On the other hand, among ICU practitioners, the two-way communication board was more accepted than the OVP. More than half of the ICU practitioners believed that the two-way communication boards were beneficial for the unit and the patients. Even though half of the practitioners believed that OVP created additional work for the staff, nearly two-thirds of them also considered this initiative beneficial for the family members. Interestingly, 61.5% of the clinicians (16 out of 26) who believed that OVP created more work also considered it beneficial to the families.

Improving patient- and family-centered outcomes requires a multidisciplinary and coordinated effort. A multilevel approach was selected for this study due to the various facets involved, such as individual caregiver characteristics, medical team interactions, organizational logistics, and institutional policies. Each intervention aimed to improve a different level of influence. For instance, from an organizational level, we enacted an OVP; from a healthcare team level, we implemented the two-way communication boards; and from the families' environmental level, we renovated the waiting room areas. Despite the potential advantages of conducting multilevel intervention research, interpreting its results is challenging (Clauser et al., 2012; Paskett et al., 2016).

This project resulted in several steps toward improved patient- and family-centered intensive care management in cancer patients. Our experience correlates with the growing interest

Table 3. ICU practitioners' perspectives about the initiatives

	Open visitation policy		Communication board	
	N = 52	%	N = 52	%
Preference for the initiative				
Strongly agree	9	17.3	19	38
Somewhat agree	11	21.2	16	32
Neutral	10	19.2	13	26
Somewhat disagree	12	23.1	1	2
Strongly disagree	10	19.2	1	2
N/A	0	–	2	–
Communication with family improves				
Strongly agree	8	15.4	8	15.7
Agree	14	26.9	16	31.4
Neutral	14	26.9	15	29.4
Somewhat disagree	9	17.3	8	15.7
Strongly disagree	7	13.5	4	7.8
N/A	0	–	1	–
Patient care improves				
Strongly agree	3	5.8	7	13.5
Somewhat agree	9	17.3	11	21.1
Neutral	21	40.4	15	28.9
Somewhat disagree	12	23.1	14	26.9
Strongly disagree	7	13.5	5	9.6
Beneficial for ICU				
Strongly agree	5	9.8	10	19.2
Somewhat agree	12	23.5	21	40.4
Neutral	13	25.5	11	21.2
Somewhat disagree	15	29.4	7	13.5
Strongly disagree	6	11.8	3	5.8
N/A	1	–	0	–
Beneficial for patients				
Strongly agree	9	17.3	11	21.6
Somewhat agree	17	32.7	20	39.2
Neutral	11	21.2	12	23.5
Somewhat disagree	11	21.2	5	9.8
Strongly disagree	4	7.7	3	5.9
N/A	0	–	1	–
Beneficial for families				
Strongly agree	14	26.9	8	15.7
Somewhat agree	19	36.5	30	58.8
Neutral	12	23.1	9	17.7
Somewhat disagree	4	7.7	2	3.9
Strongly disagree	3	5.8	2	3.9
N/A	0	–	1	–

(*Continued*)

Table 3. (*Continued.*)

	Open visitation policy		Communication board	
	N = 52	%	N = 52	%
More work for staff				
Strongly agree	13	25.5	3	5.8
Somewhat agree	13	25.5	16	30.8
Neutral	15	29.4	10	19.2
Somewhat disagree	7	13.7	16	30.8
Strongly disagree	3	5.9	7	13.5
N/A	1	–	0	–

N/A responses were excluded from the frequency calculations.
ICU, intensive care unit.

and acceptance of empowering and engaging families and patients by ICU staff (Kleinpell et al., 2018; Naef et al., 2020, 2021). Despite the beneficial effects, we encountered barriers with our project. Notably, the ICU staff expressed concerns that the initiatives added additional work strain. There might be some potential explanations for the ICU staff's perception regarding the OVP. First, the use of the ICU visitation passes required the staff to keep track of whether the caregivers were authorized to enter the ICU. Second, sometimes the family members who stayed overnight would accidentally forget to hand over the pass to the following designated caregiver. Dealing with this created unplanned discussions with the family to solve the issue. Third, some caregivers gained entrance to the unit through other entrances not available to the public, which could have made the practitioners feel that their efforts to provide a structured OVP were futile. This phenomenon is not unique to our project. Previous studies have reported the nursing staff concerns that more liberal visitation policies may interfere with their ability to provide excellent patient care (Berti et al., 2007; Kozub et al., 2017). However, ICUs with open visitation reported that families were highly satisfied with the policy (Soury-Lavergne et al., 2012; Chapman et al., 2016). Physicians and nurses in open visitation ICUs tended to view the policy positively as well (Giannini et al., 2013; Chapman et al., 2016).

We also faced difficulties implementing the two-way communication boards. The most commonly reported difficulty by the nursing staff was when other patients occasionally required their attention during rounds, precluding the nurse from writing down that particular patient's goal or taking the extra time to talk to the team and address the family. Despite these issues, family members felt more included in the discussions, which is consistent with the literature. Pronovost et al. (2003) carried out a prospective study in which the implementation of daily goal forms resulted in all staff having a better understanding of the goals for individual patients and improved information traffic and communication between families and staff. Additionally, another study reported that implementing ICU daily goal boards decreased the hospital length of stay and reduced errors of omission (Binnekade et al., 2010).

In light of the obstacles we faced, there is a need to promote the higher acceptance of patient- and family-centered outcomes among the ICU staff. Addressing logistical and operational hurdles expressed by the staff should be a priority. Failing to show willingness to hear their input to improve the initiatives' workflow

could lead to a loss of support from the staff. Another potential action that should be considered is conducting educational sessions about patient-centered outcomes, as this seems to be a viable alternative to reach wider acceptance among the practitioners (Coyne and Dieperink, 2017; Nguyen et al., 2017).

Other initiatives to improve patients' and families' experience in the critical care-related facilities are currently being analyzed before introduction in our unit. For instance, specialized care packages could be provided to the family/caregiver when transitioning to comfort care. This gesture can be used to educate and offer a more empathetic environment for patients, families, and staff during the bereavement process (Oliver et al., 2010). Another strategy is introducing the ICU diary to help support patients and families during their ICU stay. The ICU diary can provide resources for caregiver support and the prevention and management of ICU delirium (Rogan et al., 2020). Furthermore, the implementation of ICU diaries could also nurture communication and journaling tools that facilitate mental and physical wellness. Future potential interventions must integrate family-centered outcomes with new technologies such as developing a mobile device application that allows easy access to technological education and frequent ICU questions posed by patients and their caregivers. Due to the wide variability between the acceptance and integration of various initiatives, further research on different strategies to successfully increase patient and family engagement is essential.

The present study has several limitations. First, we encountered resistance to cultural change when staff put up barriers to engagement with two-way communication boards. Second, the multilevel implementation of concurrent patient-centered interventions at once made it difficult to isolate the potential beneficial effects of any single measure. Our study could have benefitted from a multilevel regression analysis that could, in part, isolate the effect of each intervention. Third, due to the nature of the study, different families were surveyed before and after the program was enacted. Thus, differences found between the PRE and POST surveys could have arisen from individual inherent factors of the two groups of respondents rather than being a product of the interventions. Fourth, our institution already had high interaction between patient families and ICU practitioners. Thus, this high baseline engagement could have skewed the observed effect. Therefore, our findings should be cautiously interpreted. For instance, the improvement in family communication and engagement and the higher work burden expressed by practitioners in our study might not be similar if the interventions were implemented in different settings such as community non-specialized cancer centers. Further research should address these concerns.

Conclusions

Our project effectively promoted patient- and family-centered care. The families expressed satisfaction with the communication of information and the decision-making process. Even though more than half of the practitioners agreed that an OVP was beneficial for families, there was a concern that it could create an additional burden to the staff. Practitioners were generally against implementing an OVP and did not believe it would help in patient care. The majority of practitioners supported the use of the two-way communication board which helped transfer information to families and improved their satisfaction. Finally, the added features in the ICU waiting room led to positive changes in family satisfaction. However, due to our limitations, further

research is needed to understand whether making this project universal or introducing additional novel practices would significantly benefit patients and families in the ICU.

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