



ORIGINAL ARTICLE

Family satisfaction with intensive care unit communication during the COVID-19 pandemic: a prospective multicentre Australian study Family Satisfaction - COVID ICU

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Key words

COVID-19, critical care, family, pandemic, satisfaction, virtual communication.

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Abstract

Background: Virtual communication has become common practice during the coronavirus disease 2019 (COVID-19) pandemic because of visitation restrictions.

Aims: The authors aimed to evaluate overall family satisfaction with the intensive care unit (FS-ICU) care involving virtual communication strategies during the COVID-19 pandemic period.

Methods: In this prospective multicentre study involving three metropolitan hospitals in Melbourne, Australia, the next of kin (NOK) of all eligible ICU patients between 1 July 2020 and 31 October 2020 were requested to complete an adapted version of the FS-ICU 24-questionnaire. Group comparisons were analysed and calculated for family satisfaction scores: ICU/care (satisfaction with care), FS-ICU/dm (satisfaction with information/decision-making) and FS-ICU/total (overall satisfaction with the ICU). The essential predictors that influence family satisfaction were identified using quantitative and qualitative analyses.

Results: Seventy-three of the 227 patients' NOK who initially agreed completed the FS-ICU questionnaire (response rate 32.2%). The mean FS-ICU/total was 63.9 (standard deviation [SD], 30.8). The mean score for satisfaction with FS-ICU/dm was lower than the FS-ICU/care (62.1 [SD, 30.3] vs 65.4 (SD, 31.4); $P < 0.001$). There was no difference in mean FS-ICU/total scores between survivors ($n = 65$; 89%) and non-survivors ($n = 8$, 11%). Higher patient Acute Physiology and Chronic Health Evaluation III score, female NOK and the patient dying in the ICU were independent predictors for FS-ICU/total score, while a telephone call at least once a day by an ICU doctor was related to family satisfaction for FS-ICU/dm.

Conclusions: There was low overall family satisfaction with ICU care and virtual communication strategies adopted during the COVID-19 pandemic. Efforts should be targeted for improving factors with virtual communication that cause low family satisfaction during the COVID-19 pandemic.

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Mallikarjuna Reddy Ponnappa Reddy, Umesh Kadam and Ashwin Subramaniam contributed equally to this study.

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Introduction

Over the past 2 years, intensive care units (ICUs) have been dealing with many new challenges concerning the management of patients admitted with severe acute respiratory syndrome coronavirus (SARS-CoV-2) infection. Stringent public health measures and complex

visitation restrictions were imposed to minimise coronavirus disease 2019 (COVID-19) transmission risk. Generally, admissions to an ICU invoke heightened anxiety and emotional stress for most patients and their families.¹⁻⁴ During these stressful moments, families feel vulnerable and require support, comfort, reassurance and closeness to their loved ones. Moreover, they expect comprehensive, consistent and timely face-to-face updates on their loved one's health status and prognosis. This strategy not only eases anxiety and fear among the families² but also helps build trust and therapeutic alliances between the healthcare workers (HCWs) and families. Resultantly, communicating with families is highly regarded as an integral part of overall patient care.^{5,6}

Of the many challenges, public health isolation measures and ICU visitation restrictions added layers of complexity in communicating with patients and families. Consequently, the HCWs have been deprived of face-to-face sit-down meetings where they could listen to families patiently, inform them of the patient's condition or break bad news using appropriate verbal and nonverbal communication skills displaying empathy.⁷ However, nothing prepares anybody for the realities of communicating in an entirely new way with families at times of such stress.

Virtual communication has become common practice during the COVID-19 pandemic to address the restrictions to family ICU visitation.^{8,9} Knowing the family experiences of the patients in COVID-ICU is vital to minimise risks for patients and families.¹⁰ We explored the family satisfaction of virtual ICU communication techniques and family satisfaction during the COVID-19 pandemic with the hypothesis that the new communication techniques were inadequate and lacked a personal touch.

Methods

Ethics

The study Family satisfaction with ICU communication during the COVID-19 pandemic: A prospective multicentre Australian study, was approved by the Monash Health research ethics committee (reference number: 70706/MonH-2020-241 767) on 15 January 2021 in accordance with the ethical standards of the institutional ethics committee on human experimentation and with the Declaration of Helsinki 1975, and site-specific assessments were obtained from the other two hospitals. The need for informed consent was waived because of the observational nature of the study and consent was implied by completion of the survey.

Setting

This prospective multicentre survey was conducted in three metropolitan ICUs in Victoria, namely Werribee Mercy, Monash Health Casey and Frankston Hospitals. These hospitals with bed capacities between 275 and 500 and a total of 35 ICU beds had mixed medical and surgical patients. They were staffed with two attending intensivists, one ICU senior registrar and either one or two ICU residents during the daytime and one on-call intensivist, one ICU senior registrar and one ICU resident at nighttime. All three hospitals had visiting restrictions during the study period.

ICFS-ICU questionnaire

The survey was conducted using an adapted version of the validated Family Satisfaction with the ICU (FS-ICU) 24-questionnaire.^{6,11-23} The original FS-ICU questionnaire measured two broad parts. The first part assessed the satisfaction level of domains related to ICU care. The second part focused more on satisfaction with the quality of information and decision-making. It contained three open-ended questions for written comments: Do you have any recommendations on how care in the ICU could be improved? Do you want to mention something that we did well? Do you have any further comments or recommendations that could be helpful for the staff of the ICU? For the study, we asked a fourth free-text question to explore the virtual communication strategy during the COVID-19 pandemic: Do you have any suggestions or comments regarding video/phone calls organised with patients in the ICU during restrictions for visitation? The FS-ICU provided three summary scores: FS-ICU/care (satisfaction with care), FS-ICU/dm (satisfaction with information/decision-making) and FS-ICU/total (overall satisfaction with the ICU).

Modified FS-ICU questionnaire development and distribution

The adapted questionnaire was prepared and revised following input by clinical experts. A web-based anonymous survey was developed using the Google Forms platform and published online (Supplementary appendix). The family/next of kin (NOK) were provided the option of responding to the survey either electronically or paper-based, which was posted to those NOK upon request. Three reminders were sent 2 weeks apart. Social workers' assistance was used to effectively handle stressful phone call conversations with NOK.

Participants and recruitment

The NOK of all consecutive adult patients aged >16 years admitted to the ICU for ≥ 48 h, between 1 July 2020 and 31 October 2020, were requested to complete the questionnaire. Those who refused consent were excluded. The patients' and their NOK details were collected from the patients' electronic medical records. Participation was voluntary, with no incentives offered.

Data collection

Patients' demographic data obtained from electronic medical records included age, sex, illness severity score (Acute Physiology and Chronic Health Evaluation [APACHE] III scores), need for mechanical ventilation, ICU length of stay (LOS) and ICU mortality. The NOK were requested to provide the following data: age group, sex, relation to the patient, their educational status, whether they lived with the patient, geographical proximity to the hospital and how often they visited the patient if not living together and any previous ICU experience. The deidentified survey responses were exported from the online survey platform into Microsoft Excel format. All paper-based responses were manually entered. The individual items of the FS-ICU represented in a five-point Likert response between poor and excellent and the scale values were transformed between 0 and 100, with higher numbers indicating greater satisfaction (for most items: 0 = poor, 25 = fair, 50 = good, 75 = very good, 100 = excellent) as previously published.^{12,18,21}

Outcome measure

The primary aim was to identify whether the NOK were satisfied with the overall ICU communication. Subgroup analyses were performed by comparing the survey responses between different groups, namely: (i) NOK's age (<60 vs ≥ 60 years); (ii) NOK's sex; (iii) NOK's level of education (up to high school vs college-level); (iv) whether the NOK were able to visit the patient in the ICU; and (v) patients' ICU LOS (<3.5 vs ≥ 3.5 days).

Statistical analysis

Descriptive statistics are presented both using the mean (standard deviation [SD]) and median (interquartile range [IQR]). Categorical data are described using frequencies and percentages. Cronbach α analysis was performed to assess for internal consistency of the items that measure the same constructs and an $\alpha > 0.70$ was deemed good internal consistency reliability for

subscales. Correlations between items were calculated by Spearman rank-order correlations. Two-group comparisons were analysed using either a standard *t* test for normally distributed data or Wilcoxon rank-sum test for nonnormal data. Two-group comparisons were analysed using Mann-Whitney *U* test. A logistic regression analysis was conducted to examine the relationships between FS-ICU scores and the characteristics of patients (age, sex, ICU LOS, ICU mortality, need for mechanical ventilation and APACHE III scores) and NOK characteristics (call at least once daily, level of education, age ≥ 60 years, sex, of non-English-speaking background, patients' ICU LOS, if mechanically ventilated or died in the ICU). Although prepandemic, a score of <75 independently predicted FS-ICU/total,²² our median FS-ICU/total score was 65.9. Therefore, the family satisfaction scores were assigned to two categories based on a score of <65 versus ≥ 65 . The results are presented as odds ratios (ORs) with 95% confidence intervals (CIs). Two-sided tests were performed at an α level of <0.05 throughout using SPSS Statistics (version 27, IBM). The missing data were handled by a case-wise deletion in the individual analyses. NOK's comments to the four open-ended questions were analysed qualitatively.

Results

Response rate and demographics of ICU patients and respondents

During the recruitment period, the NOK of 441 patients who met inclusion criteria were invited to participate. Although about half ($n = 227$) agreed to participate, only 73 NOK completed the survey (response rate, 32.2% [73/227]) and were included in the final analysis (Fig. 1). More than 95% of the survey questions were answered by all respondents, with no differential responses for the various survey questions. The patients' NOK who agreed to participate had higher median APACHE III scores than those who refused (58 [41–73]) vs 45 ([19–72]); $P < 0.001$). However, there was no difference in APACHE III scores of patients' NOK who initially agreed to participate, compared with those who completed the survey (55 [41–76]) vs 60 ([42–73]); $P = 0.94$). A total of 30.1% of patients ($n = 22$) needed mechanical ventilation. The median ICU LOS was 3.5 (2.5–5.9) days, with an ICU survival rate of 89%. The baseline characteristics of the participating NOK showed that the majority were women (61.6%, $n = 45$); 47% were aged ≥ 60 years and half were partners. A total of 38.4% of NOK ($n = 28$) did not live with the patient and 41.1% ($n = 30$) had up to a high school education. The baseline characteristics of the

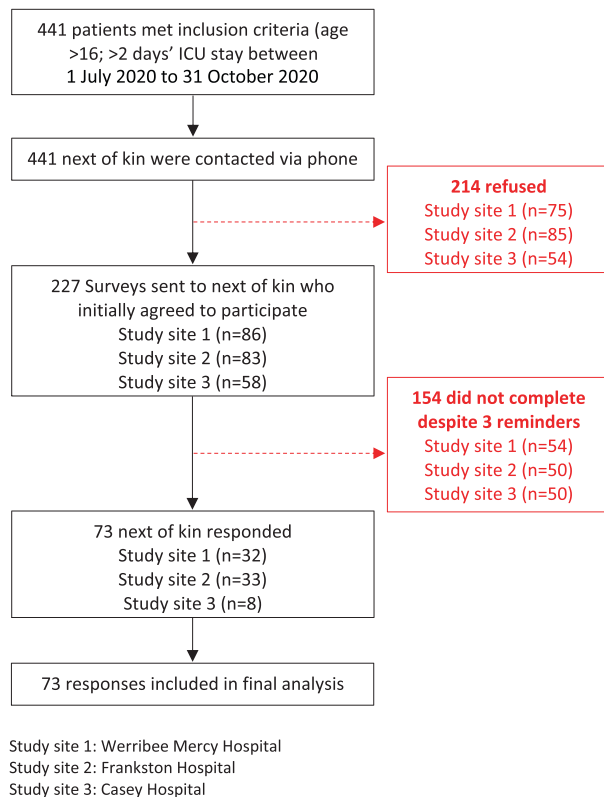


Figure 1 Flowchart of study participants.

patients and responding NOK are summarised in Table S1.

Summary scores

The mean (SD) FS-ICU/total was 63.9 (30.8) on a scale of 0 to 100 (Table 1), with the mean FS-ICU/dm score lower than the FS-ICU/care score (62.1 [30.3] vs 65.4 [31.4]; $P < 0.001$). The mean (SD) scores for family satisfaction with care (FS-ICU/care and FS-ICU/dm) are illustrated in Figure 2. NOK reported the greatest satisfaction with the ICU staff's compassionate and empathetic nature (item #11). The respondents did not find it helpful to gain information via a video call and this scored the lowest (item #16). Among the eight patients who died in the ICU, half the NOK felt that the patient's treatment was withdrawn appropriately and 62.5% ($n = 5/8$) felt supported by the ICU staff (Table S2). There was no difference in the mean FS-ICU/total scores between patients who died and those who survived (67.2 [27.6] vs 67.3 [28.3]; $P = 0.99$). Cronbach analysis found that the subscale's α alpha level was very high

(all scores ≥ 0.96). The correlation between FS-ICU/care and FS-ICU/dm was 0.72 (the correlation matrices of subdomains are presented in Table S3 and individual items in Table S4).

Prediction of family satisfaction

Logistic regression analysis was conducted to identify patient and NOK factors that might have influenced family satisfaction (Table S5). A higher APACHE III score was the only patient-related predictor that showed a significant adjusted effect associated with family satisfaction for median FS-ICU/total scores < 65 (OR, 0.98 [95% CI, 0.96–1.00], $P = 0.032$) for FS-ICU/total, (OR, 0.98 [95% CI, 0.96–1.00], $P = 0.021$) for FS-ICU/care and (OR, 0.98 [95% CI, 0.96–1.00], $P = 0.049$) for FS-ICU/dm. With regards to NOK-related factors, female sex (OR, 0.31 [95% CI, 0.10–0.94], $P = 0.038$) and patient dying in the ICU (OR, 6.96 [95% CI, 1.04–46.61], $P = 0.046$) were independent predictors for median FS-ICU/total score ≥ 65 . Female sex (OR, 0.28 [95% CI, 0.09–0.85], $P = 0.025$) and telephone calls at least once a day by the ICU doctor (OR, 0.29 [95% CI, 0.09–0.92], $P = 0.035$) were independent predictors for the median FS-ICU/dm score of < 65 . There were no independent predictors for FS-ICU/care.

Open-ended written comments

Two hundred three comments (67 respondents) were categorised into six themes: statements of gratitude and satisfaction; care; communication; respect and compassion showed to family or patient; other and suggestions on how to organise video calls with patients when visitation restrictions occur; and 29 subthemes (Table 2). Many NOK expressed gratitude and satisfaction. The most frequently identified negative comments highlighted the frequency and regularity of communication, access to an ICU doctor, lack of respondents' awareness of the telecommunication devices and not being able to visit their loved ones in the ICU. The areas for improvement as recommended by the respondents included regularity of family updates, improving access to contact patients and accuracy of updates, showing respect and compassion to the family, educating the family about virtual communication and use of devices and improving communication skills of HCWs.

Subgroup analysis

Analysis of FS-ICU subdomains based on NOK's education status was significant, with those with up to a high school education having poorer overall satisfaction of

Table 1 Overview of all items

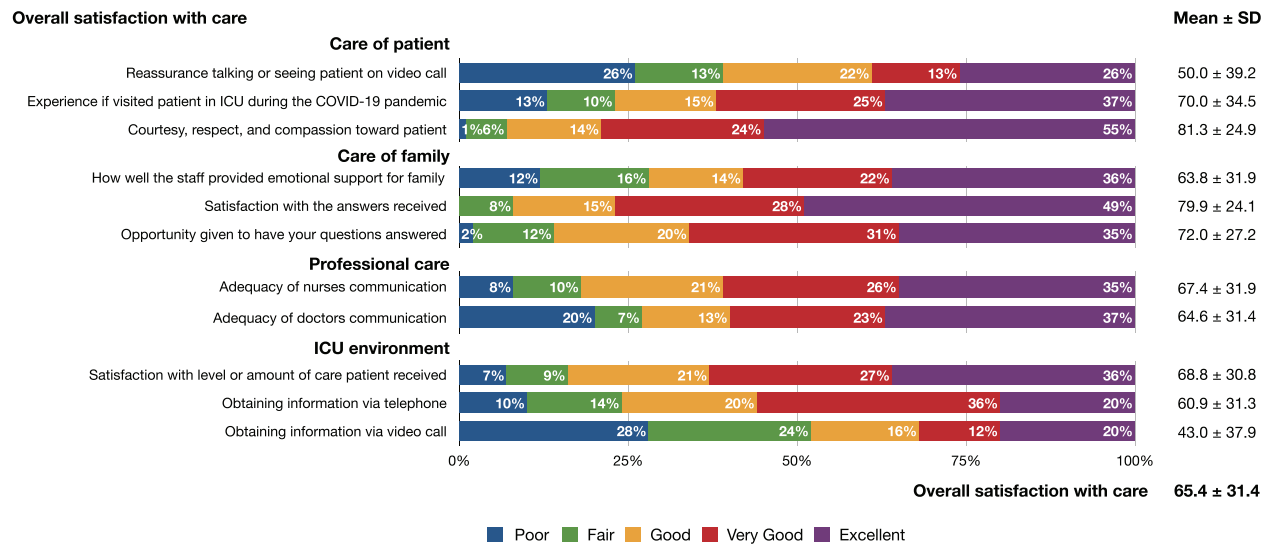
Items	Data missing, %	Not applicable, %	Median (IQR)	Mean (SD)	Corrected item subscale correlation†
Overall satisfaction of care					
Care of the patient					
17. Did you feel reassured when talking to or seeing your family member on a video call?	-	68.5	50 (0–75)	50.0 (39.2)	0.97
18. If you visited your family member in ICU during the COVID-19 pandemic, how was your experience?	1.4	44.4	75 (50–100)	70.0 (34.5)	0.97
11. Did you feel that the ICU staff were compassionate and empathetic?	1.4	1.4	75 (75–100)	81.3 (24.9)	0.97
Care of family					
3. Overall, how was the emotional support provided by the ICU staff?	-	4.1	75 (25–100)	63.8 (31.9)	0.97
13. How satisfied were you with the answers you received?	1.4	8.3	75 (75, 100)	79.9 (24.1)	0.97
14. How much opportunity were you given to have your questions answered?	1.4	8.3	75 (50–100)	72.0 (27.2)	0.97
Professional care					
4. How well did the nurses communicate with you about your family member?	-	2.7	75 (50–100)	67.4 (31.9)	0.97
5. How well did the doctors communicate with you about your family member?	-	2.7	75 (25–100)	62.0 (38.5)	0.97
ICU environment					
2. How was your overall experience interacting with the ICU staff?	-	-	75 (50–100)	68.8 (30.8)	0.97
15. How helpful was it to obtain information about your family member's condition via telephone?	1.4	1.4	75 (50–75)	60.9 (31.3)	0.97
16. Was it helpful to gain information about your family member's condition via video call?	-	65.6	25 (0–75)	43.0 (37.9)	0.97
Overall satisfaction with decision-making					
Information needs					
6. How often did the ICU doctors communicate with you about your family member's condition?	-	5.5	50 (25–75)	46.7 (30.6)	0.94
12. Did you feel that the ICU staff were patient when responding to your queries?	1.4	6.9	75 (75–100)	80.6 (24.5)	0.93
8. How easy was it to understand the information the ICU doctors provided about your family member's condition?	-	2.7	75 (50–100)	64.6 (31.4)	0.93
1. How did the ICU staff do in considering/meeting your needs as next of kin during your family member's ICU admission?	1.4	-	75 (50, 100)	69.1 (31.5)	0.93
7. How easy was it for you to get information from the ICU doctors about your family member's condition?	-	4.1	50 (25–75)	54.3 (34.6)	0.93
9. Did you feel that the information you received from ICU staff was reliable?	1.4	2.8	100 (50, 100)	78.9 (26.1)	0.94
10. Did you feel that the information given to you about your family member was consistent across various doctors/nurses?	1.4	4.2	75 (75–100)	73.9 (25.5)	0.93
Decision-making process					
19. Did you feel included in the decision-making process?	-	-	50 (25–100)	56.2 (37.4)	0.93
20. Did you feel supported during the decision-making process?	-	-	50 (50–75)	61.0 (27.9)	0.93
	1.4	-	50 (50–75)	52.8 (31.6)	0.93

Table 1 *Continued*

Items	Data missing, %	Not applicable, %	Median (IQR)	Mean (SD)	Corrected item subscale correlation†
21. Did you feel you had enough information to make an informed decision about your family member's treatment?					
22. When making decisions, did you have adequate time to have your concerns addressed and questions answered?	2.7	-	50 (25–50)	45.1 (31.6)	0.93
The total score of family satisfaction with care in the ICU			65.9 (33.0–88.6)	63.9 (30.8)	0.98

†Corrected item subscale correlations were Cronbach α with 'scale with item deleted'. COVID-19, coronavirus disease 2019; ICU, intensive care unit; IQR, interquartile range; SD, standard deviation.

(A)



(B)

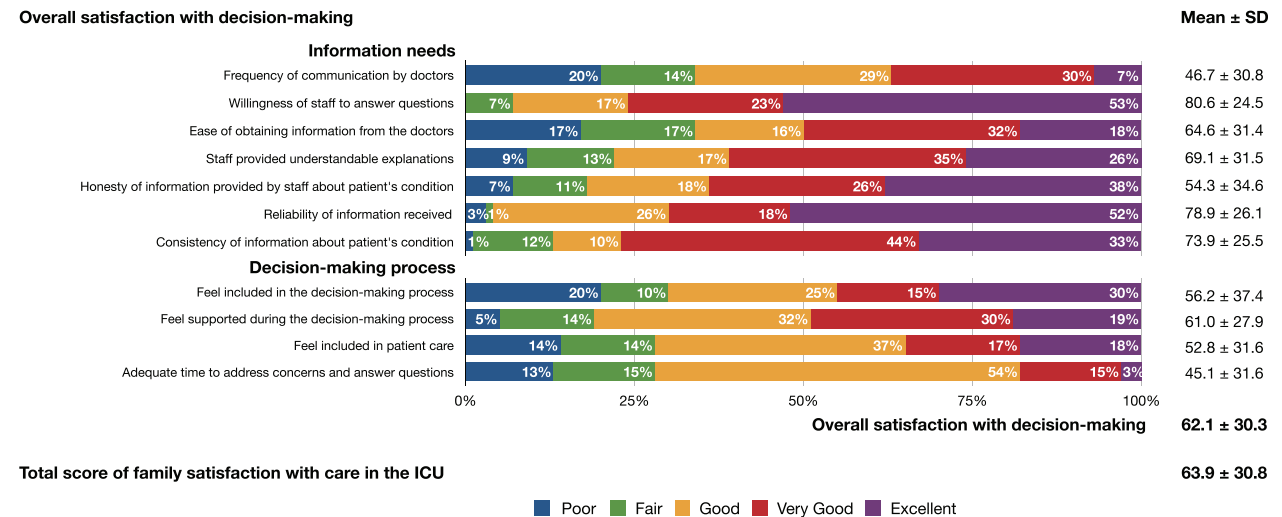


Figure 2 Scores for family satisfaction with intensive care unit (ICU) care and decision-making. COVID-19, coronavirus disease 2019.

Table 2 Written comments categorised by themes

Categories of written comments	Positive	Negative
Statements of gratitude and satisfaction		
Statements of gratitude	18	0
Statements of satisfaction	17	0
Care		
Evaluation of overall care	21	4
Evaluation of specific care activities	0	1
Family or patient mental health and well-being	8	4
Communication		
Overall satisfaction with communication	4	0
ICU staff communication skills	0	4
Frequency of communication	0	11
Regular updates	3	10
Honesty and openness	2	1
Access to appropriate ICU doctor for communication	1	6
Clarity and completeness of communication across staff	3	2
Video calls	3	5
No follow-up/being left waiting	0	5
Nonspecific	2	3
Respect and compassion showed to family or patient		
Shown to family	3	3
Shown to patient	3	0
Other		
Hygiene (management of COVID-19 and public safety)	2	1
Inclusion of family in care and decision	3	2
Visiting hours and patient access	2	5
Privacy	0	1
Suggestions on how to improve video/phone calls with patients when visitation restrictions occur		
Overall satisfaction	3	5
Lack of awareness of this service	0	11
Access to device	0	4
Lack of guidance	0	4
Frequency of video calls	0	2
Consistency of video calls	0	2
Communication with family regarding feasibility (e.g. if patient delirious)	3	0
Improving access to contact patients (e.g. dedicated phone person)	1	6

A total of 67 next of kin who responded with open-ended comments. Comments were analysed by framework approach. First, subthemes were developed from comments and statements. Next, subthemes (given in normal print) were grouped into themes (given in bold). If one respondent made more than one positive or negative comment to the same subtheme, only one was counted. COVID-19, coronavirus disease 2019; ICU,

care when compared with those with at least a college-level education. However, there was no difference in overall satisfaction with decision-making based on NOK's education status (Table S6). All other subdomain

subgroup analyses, based on NOK's age (<60 vs ≥60 years), sex, if they were able to visit them in the ICU or patients' ICU LOS (<3.5 vs ≥3.5 days), were comparable (Tables S7–S10).

Discussion

To the best of our knowledge, ours is one of the first prospective multicentre studies in Australia that assessed family satisfaction from virtual communication during the COVID-19-related ICU visitation restrictions and provides early insights. Our FS-ICU survey of 73 patients' NOK admitted to the ICU during the second pandemic wave in 2020 identified some key findings. First, the overall satisfaction scores were lower than those in the prepandemic literature^{6,12,13,15–19} and during the COVID-19 pandemic.²⁴ Second, despite the NOK expressing high satisfaction with courtesy, respect and compassion shown toward patients and families, they articulated that HCWs displayed a lack of emotion during such interactions. Third, the mean FS-ICU/dm score was lower than the FS-ICU/care score, suggesting a relative lack of inclusiveness of NOK in the decision-making process. Fourth, a higher patient APACHE III score, female NOK, death of the patient and a telephone call at least once a day by an ICU doctor independently predicted better family satisfaction with care in the ICU. Last, NOK with lower educational status had poorer overall satisfaction, suggesting that better communication strategies are required. The results of our study need to be interpreted with caution given the relatively low response rate.

Virtual communication evolved as a key modality to bridge the communication barrier between patient families and healthcare providers during the COVID-19 pandemic. Multiple studies before the pandemic explored the quality of face-to-face communication using the FS-ICU tool, demonstrating that the mean FS-ICU scores ranged between 75.4 ± 17.7–85.6 ± 14.6,^{6,15,19,25,26} and had an overall positive impact in reducing family's psychological stress.^{1–4,19} Contrarily, lower mean FS-ICU/total scores were seen in our study. Our findings were comparable to a recent single-centre study of 63 family members of non-COVID-19 critically ill patients, who had a mean FS-ICU/total of 70.5 (SD, 18.6).²⁷ In contrast, a recent study from Portugal found an overall family satisfaction of more than 80% during the pandemic.²⁴ This study was, however, different from our study. For example, it was from a single centre that only estimated overall family satisfaction, rather than exploring FS-ICU/dm and FS-ICU/care specifically. Furthermore, limited visitation was permitted in that study hospital in comparison to ours, where NOK were only allowed for compassionate reasons.

Table 3 Proposed steps to improve communication and family satisfaction

Number	Proposed steps to improve family satisfaction
1	Provision of information about virtual communication and ensuring appropriate device being available and proper orientation about individual devices to the families.
2	Direct access to the patient via a dedicated phone through a family communication or liaison team ^{1,2,35-37}
3	Training HCWs on communication skills, focusing on listening and allowing families opportunity to speak. ³⁸
4	Minimal once daily telephone calls, at a fixed time ³⁹ , by fixed person. ⁴⁰
5	Ensure accuracy and consistency of information.
6	Adopting different communication style and strategies for families with lower educational status. ⁴¹
7	Allowing ICU visitation on compassionate grounds.
8	Early screening for psychological distress and social support levels should be included in updates of visiting and communication policies in ICU. ²⁷
9	It is important to promptly identify family members at risk of poor ICU experience to enhance efforts to provide adequate support. ²⁷

HCW, health care worker; ICU, intensive care unit.

The low family satisfaction in our study could be attributable to the following reasons. The ICU admission-related stress was found to undermine family satisfaction.²⁷ Moreover, instrumental social support activities, such as childcare or assistance with daily chores, may have been limited because of social isolation caused by the stage 4 restrictions across Melbourne.²⁷ Full personal protective equipment donned by HCWs could have masked verbal and nonverbal cues, contributing to lower family satisfaction.^{7,28} The lack of HCW support due to time constraints⁸ could have resulted in insufficient opportunities for families to raise their concerns and/or acquire satisfactory answers. Poor communication style by HCWs and lack of consistency in delivered information could also have resulted in lower satisfaction rates. Furthermore, emotionally and physically exhausted HCWs could have contributed to lower family satisfaction.^{7,20,29} Other factors that could have contributed to lower satisfaction include the first-time experiences for HCWs and families alike,⁸ lack of familiarity and challenges using smart devices and/or technology, inadequate access to technology,⁸ network issues, technical glitches and a noisy environment from monitoring alarms and ventilators, which could have limited effective communication.

Mean FS-ICU/dm scores were lower than the mean FS-IC/care score observed in previous studies.^{12,22,27} This might be attributable to the time constraints experienced while using virtual communication, unlike face-to-face meetings. Families felt that they were not included as

much as they should have been in the decision-making process pertaining to management goals during such critical times when they were under tremendous emotional stress. This may have resulted in them not asking the right questions or not understanding the explanations provided by the treating HCWs. Lack of other family members' support due to social isolation from lockdowns could have further added to their distress. Melbourne is a diverse multicultural city with two of the three participating hospitals catering predominantly to the ethnic population. Taboos that prevail over the withdrawal of care and death would have played a role when the discussion over treatment limitations was discussed, resulting in lower FS-ICU/dm scores.^{30,31}

Varied associations between disease severity and family satisfaction have been observed, with positive association,⁶ negative association²² or no association.^{12,32} We observed better family satisfaction with higher illness severity, possibly attributable to more frequent or longer communication with sicker patients' NOK. Prior studies have shown that the ICU survival status was independently associated with satisfaction of overall care.^{12,18,33} Contrarily, we did not find that difference in our study and observed that families expressed a high degree of satisfaction with the end-of-life care process.³⁴

Strengths and weaknesses of the study

The key strengths of our study include that it was multi-centre and prospective, conducted during the peak of the second wave of the COVID-19 pandemic. The methodology was robust with no sampling bias. A validated FS-ICU tool was used. Furthermore, multiple subgroups were explored. However, some limitations need to be acknowledged. First, there may have been recall bias for NOK as they were responding to the questionnaire months after their loved ones were admitted to the ICU. Second, a poor response rate could be considered as a nonresponse bias and affect generalizability. This was considerably lower when compared with two recent studies that had 57.7% to 72.4% response rates.^{24,27} In addition, survey responses are difficult to predict and beyond our control despite adequate reminders. We hypothesize the following reasons for the poor response rate: (i) stress of having a loved one in the ICU; (ii) stage 4 lockdown in Melbourne meant that people could only travel up to 5 km and those with post offices further away may not have been able to post the completed paper-based surveys; (iii) much older NOK may not have been tech-savvy to complete the online survey and (iv) social isolation could have left ICU family members without much social support with less time to obtain

regular updates of their loved ones²⁷ or respond to the survey. This limits our interpretation of findings; however, we can only speculate whether higher response rates improved family satisfaction. Third, patients who refused were more likely to have more dissatisfaction with communication. Fourth, order bias could not be avoided when designing the survey, wherein the order of questions in the survey may have influenced the perception of the respondents. Last, the study was limited only to the state of Victoria; however, we conducted it at the peak of the second wave, and, therefore, were likely to obtain the true reflection of family satisfaction.

Our study findings provide early insights into the virtual communication aspects of patient care in ICUs during the COVID-19 pandemic. We have identified thought-provoking proposed steps to improve family satisfaction and have summarised them in Table 3.^{1,2,24,27,35–41}

Conclusion

Despite the low response rate, our Australian multi-centre prospective study found an overall low family

satisfaction of ICU care with virtual communication strategies adopted during the COVID-19 pandemic. Family satisfaction was lower for decision-making, suggesting a perceived lack of inclusiveness of NOK in the decision-making process. Patients with higher APACHE III scores, female NOK, death of the patient and a telephone call at least once a day by the ICU doctor independently predicted better family satisfaction with care in the ICU. Efforts should be targeted for improving factors with virtual communication that cause low family satisfaction during the COVID-19 pandemic. Our findings provide early insights that reflect a thought-provoking improvement in certain aspects of quality of care of critically ill patients.

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's web-site:

Table S1. Patient and responding NOK's baseline demographics

Table S2. Views of NOK whose loved ones died in the ICU ($n = 8$)

Table S3. Correlation matrix based on the six domains of communication.

Table S4. Correlation matrix of all of the items of the family satisfaction with care and decision-making

Table S5. Logistic regression analysis of overall family satisfaction by patient and NOK's characteristics

Table S6. Comparison based on NOK educational status (high school level vs college level)

Table S7. Comparison based on patients' ICU LOS (3.5 days).

Table S8. Comparison based on NOK age (<60 vs >60 years)

Table S9. Comparison based on NOK sex (male vs female)

Table S10. Comparison based on whether they were able to visit the ICU

Appendix S1. The FS-ICU questionnaire (pdf)
