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Evaluation of 24/7 eICU Model of Care: Patient Experience

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categorised as open or closed models. In an open ICU, patients are admitted under the care of multiple generalists with or without the assistance of intensivists/ intensive care specialist. In a closed ICU model, patients are admitted under the complete care of a trained intensivist (2, 5). Research has shown more favourable outcomes of closed models and/or mandatory intensivist consultation not only in terms of a reduction in ICU and hospital mortality (6), but also a reduction in the length of stay for critically ill patients in an ICU (5).

In providing access to specialist intensivists, the eICU provides an opportunity to reap the gains associated with closed models. ICUs in NSW are classified as Level 4, 5 and 6. Level 4 ICUs are located in smaller hospitals, Level 5 in metropolitan hospitals and Level 6 ICUs in tertiary hospitals. Patients requiring complex, long-term therapies are transferred from Level 4 ICUs to Level 5 or Level 6 ICUs. Some Level 4 ICUs in NSW function as open collaborative models (OCM) where patient care is under the admitting specialist, with limited or no intensive care specialist availability. Level 4 ICUs can also function as closed collaborative models, where an intensive care specialist is responsible for patient management. A report from the Agency of Clinical Innovation NSW indicated that failure to recruit intensive care specialists resulted in uncoordinated, fragmented and unsupported care with limited access to senior critical care advice and management, particularly for deteriorating patients in OCM Level 4 ICUs (2). The eICU model may tackle this longstanding challenge of critical care delivery related to staffing ICUs, particularly in addressing inequities in ICU resourcing in remote and rural contexts.(1). Moreover, during the pandemic, eICU was reported to aid the provision of care in line with the latest protocols for management of COVID positive patients, especially in rural and regional ICUs (1, 7)

PRESENT PROJECT

eICU provides an opportunity to increase value in care by addressing specific challenges associated with critical care provision in efficiency and clinical effectiveness of the delivery and coordination of care (8, 9). The model also provides an opportunity to improve value by enhancing clinician and patient experiences via improved convenience and accessibility to care, reduced travel time and cost to patients, and improved access to suitable staffing levels and skill mix for clinicians.(10) (11). Prior to the pandemic, the paucity of functioning eICUs prohibited evaluation of the associated gains (1, 12, 13). During the pandemic, virtual delivery of health care promulgated including rapid implementation of eICUs (1, 7) providing an opportunity to address this evidence gap, particularly in NSW. The present project sought to support three, regional OCM Level 4 ICUs during the COVID 19 pandemic. The Campbelltown Level 5 ICU provided specialist virtual care ward rounds supervision at Level 4 ICUs in Goulburn, Bowral and Bega hospitals. The ward rounds provide a single daily virtual care specialist review with telephone on call as required at other times. The model has been evaluated for its effectiveness, efficiency and impacts of clinician experiences. The present report provides evaluative findings of the experiences of patients who engaged in the eICU model.

OBJECTIVE

Commissioned by the South-Western Sydney Local Health District, the present analysis sought to determine the patient experience of receiving care in an eICU model of care.

METHODS

DESIGN

Cross-sectional survey.

SAMPLE AND RECRUITMENT

All patients who were exposed to the eICU model of care were eligible to participate. A total of 73 patients were invited to participate across the Bowral and Goulburn sites. Recruitment was inhibited due to patients being in ICU with COVID restrictions on visitors.

SURVEY INSTRUMENT

Quantitative categorical data were collected via structured surveys to determine patient experiences of being cared for via the eICU model, the gains of the eICU model and desire for its future use. The paper-based survey instrument was developed by the project team based on the ACI virtual care tool (14), adapted for relevance to eICU. and contained eight items, with two or three categorical response options for each item.

DATA COLLECTION

The survey was administered by a ward clerk at Bowral Hospital who was independent to the project team over a three-month period.

DATA ANALYSIS

Survey data were provided via completed paper-based surveys to the Macquarie University team. The data were input to Qualtrics XM Software and exported to R software Version 4.3 for analysis. Frequencies were reported for each item. Responses were grouped into 'Yes' or 'No' categories and were plotted using 'Likert' package in R.

RESULTS

PARTICIPANT CHARACTERISTICS

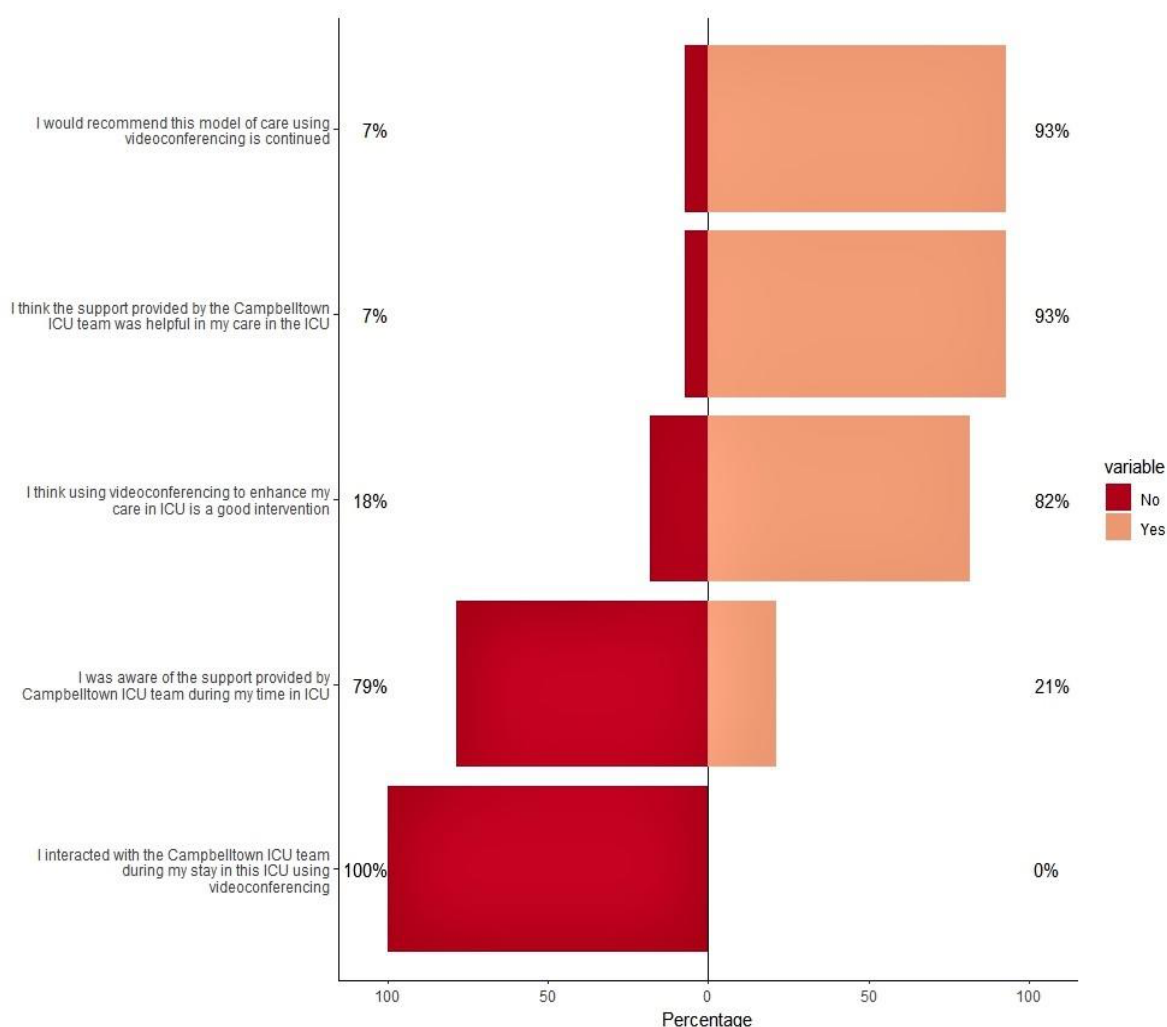
A total of 14 responses were received, with limited demographic information available about participants. All participants received care at the Bowral ICU, 8/14 were female and 6/14 were male.

SURVEY FINDINGS

Most patients (n=11; 79%) were not aware of the support being provided by the Level 5 ICU to the Level 4 team during their stay. Despite this, more than half of respondents (n=8; 57%) perceived that the provision of the virtual care support from the Level 5 ICU was definitely helpful in their care and nearly 36 % (n=5), perceived it to be somewhat helpful. None of the respondents directly interacted with the Campbelltown team using videoconferencing during their stay and therefore could not provide feedback as to whether videoconferencing was helpful in their care or on the quality of the video in terms of sound and image. However, most respondents (n=9; 64%) agreed that the notion of videoconferencing during ICU care was a valuable approach to enhance care. Overall, almost all respondents (n=13; 93%)

indicated that they would recommend the eICU model using videoconference to continue. Respondents to individual items are depicted in Figure 1.

Figure 1: Proportion of patients that agreed with each statement regarding their experiences of being cared for via the eICU model.



RECOMMENDATIONS

Experiences reported by patients revealed that the concept of an eICU model was strongly supported but provided limited insight into the direct experiences of care among the patient respondents. In the context of ICU care, patient interactions using virtual technologies was limited and support is predominantly provided in a clinician-clinician model. Patients therefore have less awareness of the impacts of the eICU model on their care. ICU patients are also generally those experiencing acute ill health and may be less able to provide real-time feedback about their experiences due to the

clinical interventions they are undergoing. The present project provided a small sample of pilot data, which requires advancement in a large pool of data from a range of Level 4 sites in order to draw conclusions. A full-scale evaluation of the eICU model may seek to utilise multi-source data to determine patient experiences of the model of care as outlined in the recommendations provided:

1. (a) Patient perceptions and preferences for the eICU model are important to determine and consider in addition to direct experience data. These data may be gathered via survey or interview methods with a population who have experienced care in ICU settings beyond those directly engaged in the eICU model.
2. (b) For those engaged in the eICU model, several strategies may be applied to enhance the value and quality of data capture to determine experiences relevant to the model of care:
 - i. the **number of respondents** may be increased by capturing patient-reported experiences from those who have recently been discharged in addition to inpatients.
 - ii. For those engaged in the eICU model, the **scope of questions** may be expanded to determine knowledge, awareness, understanding and in providing opportunities for free text comments regarding perceived benefits or concerns about the eICU model

that was used in their care.
 - iii. For those engaged in the eICU model, the **pool of respondents** may be broadened

by inviting respondents from support persons and family who were involved in the

care episode.
3. (c) Patients are predominantly not directly engaged in clinical interactions in eICU, it may

pertinent to therefore identify aspects of the patient experience that are relevant to this model of virtual care for further evaluation.

CONCLUSION

Virtual care that supports best practice in the ICU offers an opportunity to increase value for clinicians and patients. The present evaluation indicates that the eICU model is supported conceptually by patients, but that they lack awareness of its use and have limited opportunity to understand the role of eICU in their care currently such that experiential data can be provided. This innovative model of care requires further data of patient experiences to determine their preferences and needs with regard to the use of the model, and to capture the perceived impacts of the eICU model on their experiences. These data should be the subject of further study at scale to provide more comprehensive evaluation of patient experiences and support the implementation of eICU.

REFERENCES

1. Udeh C, Udeh B, Rahman N, Canfield C, Campbell J, Hata JS. Telemedicine/Virtual ICU: Where Are We and Where Are We Going? *Methodist Debaque Cardiovasc J.* 2018;14(2):126-33.
2. NSW Agency of Clinical Innovation. Intensive Care Service Model: NSW Level 4 Adult Intensive Care Units. 2015.
3. Topol E. The Topol Review. Preparing the Healthcare Workforce to Deliver the Digital Future. 2019:1- 48.
4. NSW Government Health. What is Virtual care? 2021 [updated Friday 30 April 2021. Available from: <https://www.health.nsw.gov.au/virtualcare/Pages/Virtual-care-in-NSW.aspx>.

5. Vahedian-Azimi A, Rahimibashar F, Ashtari S, Guest PC, Sahebkar A. Comparison of the clinical features in open and closed format intensive care units: A systematic review and meta-analysis. *Anaesthesia Critical Care & Pain Medicine*. 2021;40(6):100950.
6. Pronovost PJ, Angus DC, Dorman T, Robinson KA, Dremsizov TT, Young TL. Physician Staffing Patterns and Clinical Outcomes in Critically Ill Patients A Systematic Review. *JAMA : the journal of the American Medical Association*. 2002;288(17):2151-62.
7. Igra A, McGuire H, Naldrett I, Cervera-Jackson R, Lewis R, Morgan C, et al. Rapid deployment of virtual ICU support during the COVID-19 pandemic. *Future Healthc J*. 2020;7(3):181-4.
8. Armstrong CM, Wilck NR, Murphy J, Herout J, Cone WJ, Johnson AK, et al. Results and Lessons Learned when Implementing Virtual Health Resource Centers to Increase Virtual Care Adoption During the COVID-19 Pandemic. *Journal of Technology in Behavioral Science*. 2022;7(1):81-99.
9. Keyworth C, Hart J, Armitage CJ, Tully MP. What maximizes the effectiveness and implementation of technology-based interventions to support healthcare professional practice? A systematic literature review. *BMC Med Inform Decis Mak*. 2018;18(1):93.
10. Wittmeier KDM, Protudjer JLP, Wicklow BA. Reflections on Virtual Care for Chronic Conditions During the COVID-19 Pandemic. *Canadian Journal of Diabetes*. 2021;45(1):1-2.
11. Li C, Borycki EM, Kushniruk AW. Connecting the World of Healthcare Virtually: A Scoping Review on Virtual Care Delivery. *Healthcare*. 2021;9(10):1325.
12. Zapatochny Rufo RJ. The virtual ICU: Pathway to improved performance. *Nursing Management*. 2009;40(1).
13. Myers MA, Reed KD. The Virtual ICU (vICU): a New Dimension for Critical Care Nursing Practice. *Critical Care Nursing Clinics of North America*. 2008;20(4):435-9.
14. NSW Health : Virtual care patient experience real time survey. Available from: https://aci.health.nsw.gov.au/___data/assets/pdf_file/0010/673777/Virtual-care-patient-experience-real-time-question-set.pdf

