

Nursing Staff's Satisfaction with Use of Automatic Dispensing Cabinets in Intensive Care Units: Pre-Post-COVID-19 Comparison

Eric Lau¹, Suman Adhikari^{1,4}, Samantha Lee^{1,3,5}, Michelle Cuciti¹, Julia Orlov¹, Jayashruti Mohan¹, Benjamin Wood²

¹ Pharmacy Department, St George Hospital ² Intensive Care Unit, St George Hospital ³ School of Pharmacy, Faculty of Medicine and Health, The University of Sydney, Camperdown ⁴ School of Clinical Medicine, The University of New South Wales ⁵ Woolcock Institute of Medical Research, Macquarie University

Background

Healthcare technology has evolved significantly during the COVID-19 pandemic. While use of Automatic Dispensing Cabinets (ADCs) is becoming increasingly prevalent, little is known about nursing staff's perception around ADCs; particularly among those working in intensive care units.

Aim

This study aims to explore nursing staff's satisfaction with use of ADCs across the pre- and post- COVID-19 pandemic.

Method

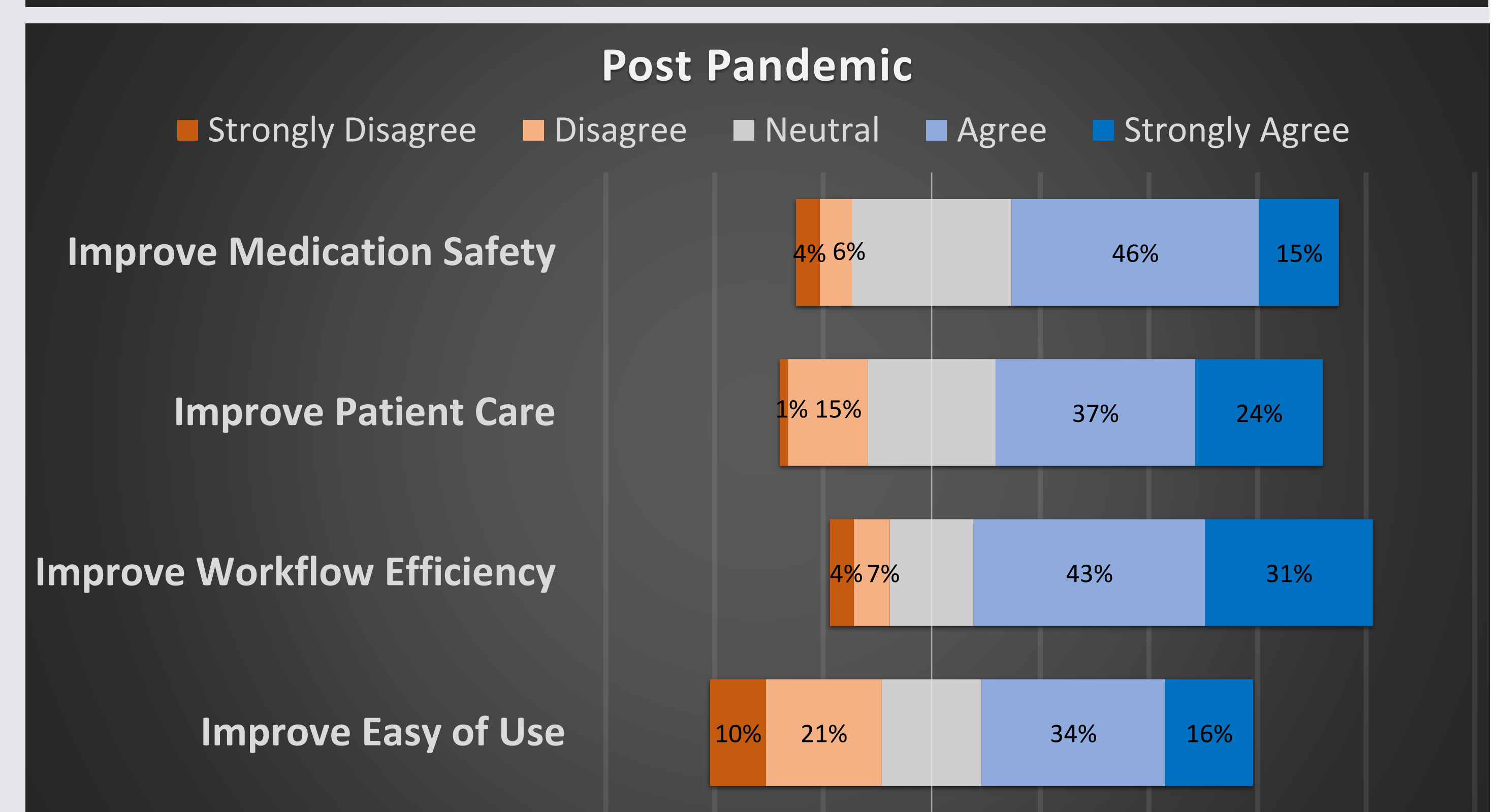
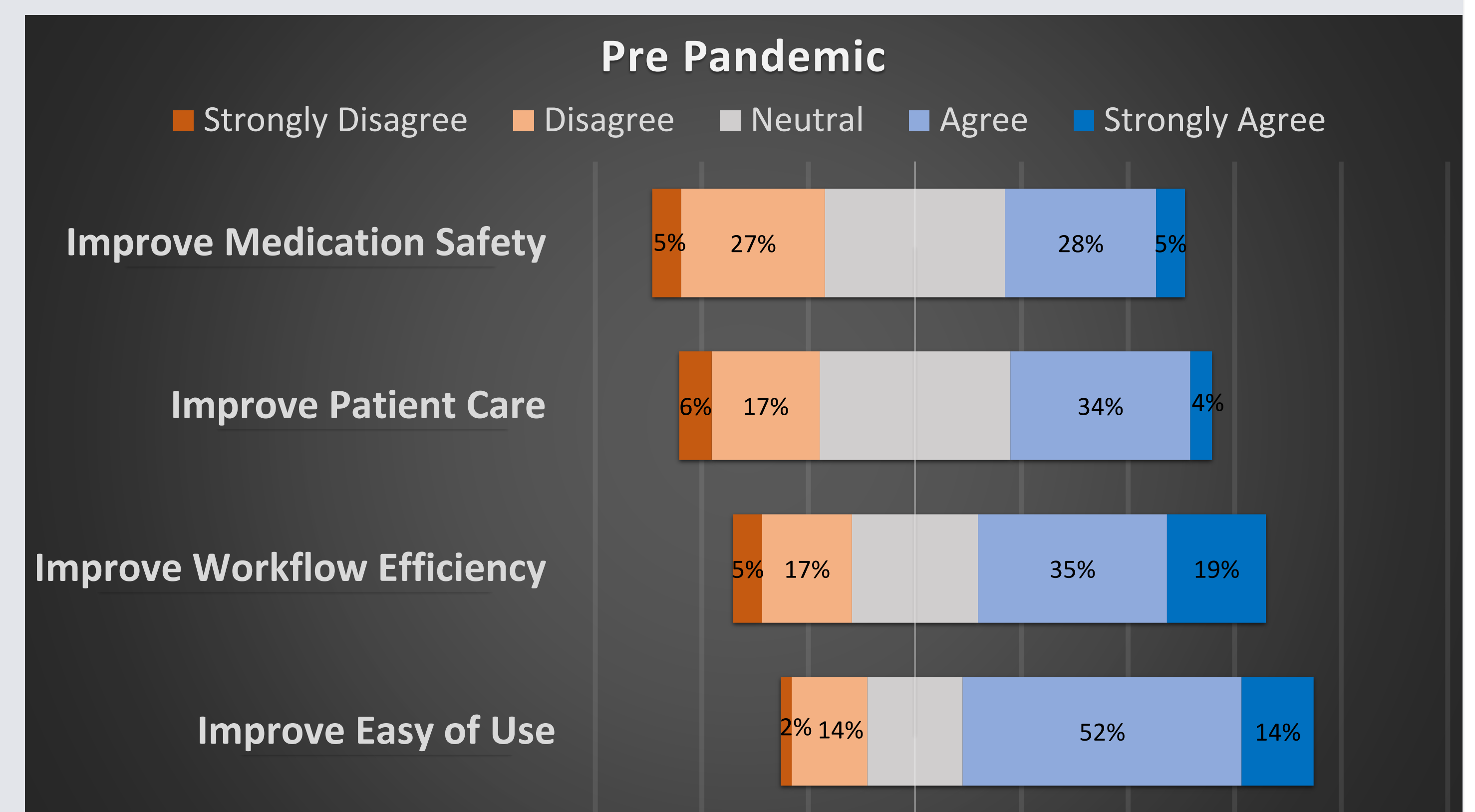
A cross-sectional survey was distributed among ICU nurses at a 700-bed tertiary referral hospital before (May-June 2018) and after (June-July 2023) the COVID-19 pandemic. Nurses were instructed to rate their degree of agreement with questions probing satisfaction across domains of medication safety, patient care, workflow efficiency, and ease of use using a 5-point Likert scale (1=strongly disagree, 5=strongly agree). In the post-COVID-19 survey, nurses were asked to provide ratings based on their experiences during the pandemic. Two-tailed t-test was used to compare the change in satisfaction ratings across the two timepoints.

Results

Seventy-four responses were received pre-COVID-19, and 34 responses were received post-COVID-19.

The use of ADCs during COVID-19 increased the nurses' subjective ratings of satisfaction around **medication safety** (mean difference=0.6 points, 95% confidence interval or CI=0.1-1.1 points, $p<0.05$), **patient care** (mean difference=0.6 points, 95% CI=0.02-1.1 points, $p=0.0001$) and **workflow efficiency** (mean difference=0.4 points, 95% CI= 0.1-1.1 points, $p=0.0001$). Ratings on **ease of use** decreased by 0.3 points post-COVID-19 (95% CI=-0.9-0.2); however, this change was not statistically significant ($p=0.14$).

| Domain | Pre-Pandemic Mean | Post-COVID Pandemic Mean | p value |
|---------------------|-------------------|--------------------------|------------|
| Medication Safety | 3.0 | 3.6 | $p<0.05$ |
| Patient Care | 3.1 | 3.7 | $p=0.0001$ |
| Workflow Efficiency | 3.4 | 3.8 | $p=0.0001$ |
| Improve Ease of Use | 3.6 | 3.3 | $p=0.14$ |



Discussion

Use of ADCs during the COVID-19 pandemic was perceived by ICU nurses to have satisfactorily improved medication safety, patient care, and workflow efficiency. However, nurses raised double-gloving when accessing ADCs in negative pressure pod as the biggest barrier towards ease of use.

Our findings are consistent with collaborative data and other similar studies^{1,2}. During the study period, no medication errors related to ADC use in the ICU were reported in ims+. Furthermore, the rate of medication unavailability at point-of-care via ADCs remained consistently low at 1.8% during the pandemic, comparable to the pre-pandemic rate of 1.7%.

Conclusion

Our findings suggest that ADCs can be an effective tool for medication management in critical care settings during pandemics and other disaster events. Investigations around improving usability of ADCs warrant future research.

References

- 1 Metsämuuronen R, Kokki H, Naaranlahti T, Kurttila M, Heikkilä R. Nurses' perceptions of automated dispensing cabinets - an observational study and an online survey. BMC Nurs. 2020 Apr 19;19:27
- 2 Rochais E, Atkinson S, Guilbeault M, Bussièrès JF. Nursing perception of the impact of automated dispensing cabinets on patient safety and ergonomics in a teaching health care center. J Pharm Pract. 2014 Apr;27(2):150-7

Correspondence: : eric.lau@health.nsw.gov.au
 LinkedIn URL: www.linkedin.com/in/ericshlau

