

Practice Problem

When preparing and administering emergent drugs in a pediatric ICU, nurses label medications for emergent procedures using handwritten white labels. This can contribute to inability to decipher handwriting and increase the risk for adverse drug events. Lack of reporting of medication errors is well documented and can impede the understanding of root causes (Goyal et al., 2023). The purpose of this EBP project is to evaluate if pre-printed, color-coded, fill-in-the-blank labels increase nurse confidence in patient safety with labeling emergent drugs in the ICU setting.



PICOT Question

In emergent situations in a pediatric ICU requiring nurses to draw up emergent doses of medication, is it safer to use color coded, pre-printed fill-in-the-dose medication labels vs. our current practice of white handwritten labels?

Search Strategy

- A line searching approach was used in CINAHL (EBSCOhost) literature database
- Medical Subject Heading (MeSH)/ keywords "medication errors", "intensive care units", PICU, NICU, "drug labeling", "readability", "human factors engineering", "product labeling", "color", "intubation" along with the term "hand written" OR "hand writing".
- Limits: <10 years old, English; Boolean operators applied to broaden and narrow the search results.

Evidence

Literature evidence reviewed (N=32) showed that:

- High risk medication administration, such as the use of emergent drugs in the pediatric ICU setting, can result in medication adverse events (Julca et al, 2018)
- In some settings, the common themes related to medication errors are as follows: incorrect dosing, incorrect medication, syringe swap, wrong patient and wrong dosing interval (Bekes et al, 2021). The most valuable strategies to sustain medication error education were standardized labeling, prefilled syringes, and two-person medication checks (Bekes, et al, 2021).
- In 2004, updated in 2020, the American Society of Anesthesiologists developed standards for drug labeling that included color coded drug labels to increase patient safety (Goel et al., 2022; ASA, 2020).
- Modeling the standards used in anesthesia, the use of color-coded pre-printed labels has been shown to increase safety with the labeling process in the hospital setting (Nunes et al, 2022; Orser et al, 2016; Souza et al, 2019).

Full literature table with appraised evidence can be found here:



Practice Change

Our project, led by an ICU nurse, evaluated the use of color-coded pre-printed, fill-in-the-blank medication labels (N=11) for emergent drug administration in the PICU, with team members including an anesthesiologist, PICU leadership, medication safety executive leadership, a pharmacist, and pediatric ICU nurses.

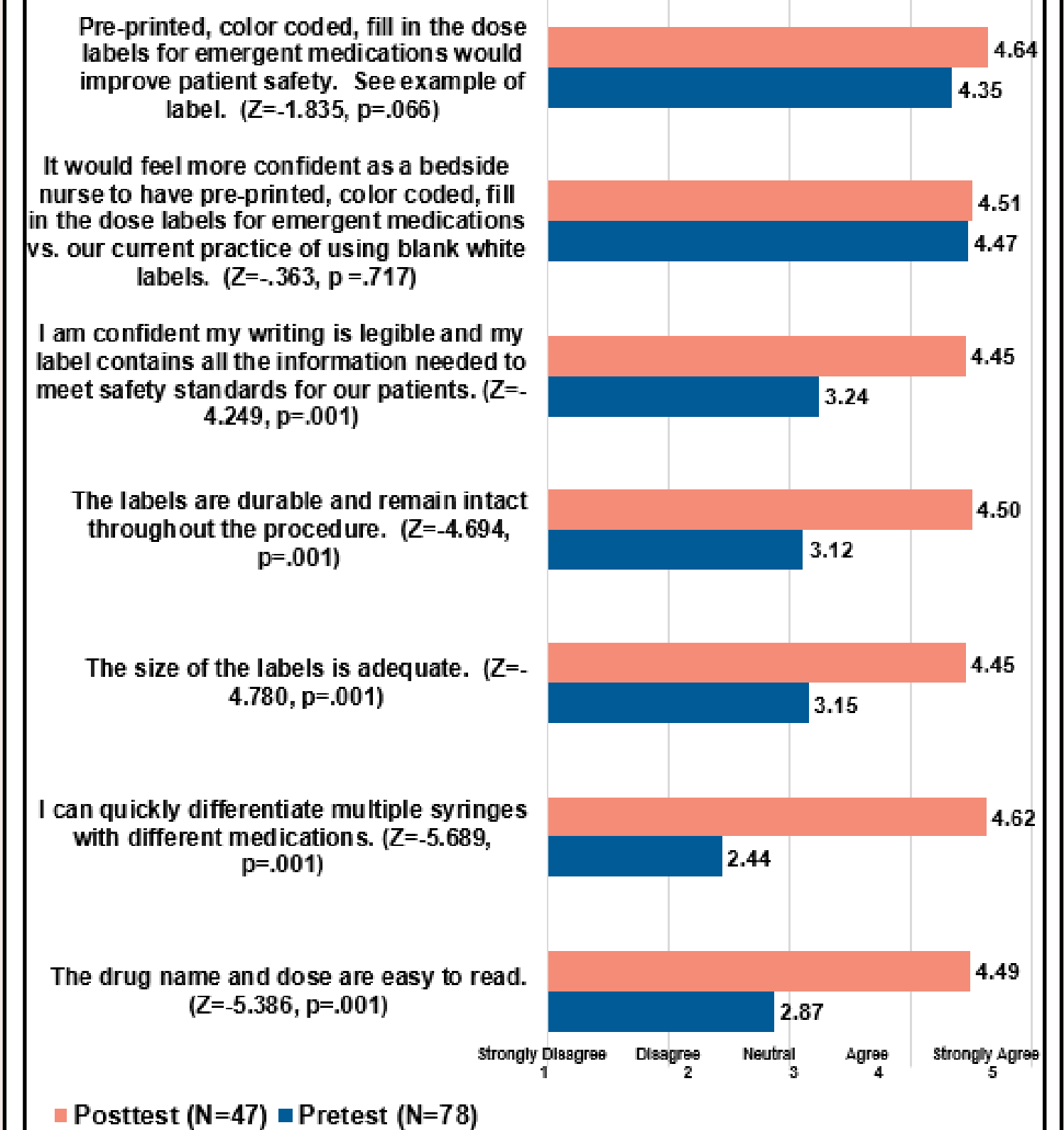
EBP Implementation Plan

- Preprinted drug labels (N=11) were placed in the individual drug bins inside and adjacent to the automated medication dispenser (ADC), Nurses retrieved medications, completed and affixed labels to syringes at the bedside.
- Staff nurses were surveyed before and after the intervention to assess perceptions of safety with color-coded preprinted labels.



Outcomes & Results

Nursing Pre & Posttest Survey



Have you encountered any challenges/barriers with medications being labeled? I.E. illegible handwriting, incorrect labeling, wrong dose being drawn up, confusion with administration

Response	Pretest (blank white labels)	Posttest (color-coded preprinted labels)
Yes	59	7
No	19	40

Recommendations for Practice

Limited data exists in the literature regarding labeling emergent medications in the PICU. In this EBP project, nurses felt more confident using color-coded, pre-printed drug labels and had feelings of improved patient safety. Further research should be conducted to evaluate these labels in other PICUs and to investigate emergent drug labeling practices in the USA.

