



KEY POINT SUMMARY

OBJECTIVES

The objective of the first study was to assess whether dividers in the bedside drawer helped in ensuring a 100% count and standardized location of the items. The objective of the second study was to examine the efficiency with regard to speed and accuracy of the nurses in retrieving from and restocking the drawers.

Emergency medical equipment storage: Benefits of visual cues tested in field and simulated settings

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Key Concepts/Context

Ready availability and easy accessibility of equipment and supplies are important in intensive care units (ICUs) to be prepared for emergent situations. Bedside drawers are where all emergency items are stored for imminent use. Authors report that in a previous study they had conducted in the same hospital, the emergency items were cluttered in the drawer and 90% of the drawers had at least one missing item. This paper reports on two studies conducted in the same ICU of a tertiary care hospital. The first study assessed the effectiveness of a divider system developed for the bedside drawer and the second study examined if the drawers helped in reducing the nurses' mental workload. The first study found that the nurses found the dividers highly satisfactory and effective. The second study concluded that the dividers were more effective for restocking and retrieving items.

Methods

The first study involved took place in three phases – in the first phase an inventory of the drawers was made to determine completeness of items. Two different 'completeness analyses' were conducted as there were two areas in the ICU – postoperative (short-term patients) and general (long-term patients) sections. A labelled drawer divider was then developed and placed in all 30 bedside drawers. Nurses were informed about the drawers and given a period of two weeks to familiarize themselves with the divider system. In the second stage of the study another completeness analysis was carried out for all 30 drawers. In the last phase 122 nurses were asked to complete a questionnaire and another completeness analysis was conducted. Data were analyzed statistically (ANOVA, Kruskal Willis test, Exploratory factor analysis, and t-tests).



Study 2 was an experimental work conducted in the same ICU. The experiment materials – one drawer with divider and emergency items (as inventoried in study 1) and one drawer with emergency items but no divider. These were placed on two trolleys and rolled next to two vacant beds in the ICU. There were 24 nurse participants. Participants were required to carry out restocking and retrieving tests. For the restocking test, items were missing in the drawer (both with the divider and without the divider). Both drawers were restocked by the participants who were timed for speed and for accuracy. These tests were video recorded. For the retrieval tests, 10 items were asked for and the participant responded saying the item was present or not. These retrieval tests were also done for both drawers – with and without the divider. Participants rated their workload on the NASA Task Load Index workload scale after restocking and completed a questionnaire following the experiment. Data were analyzed statistically (ANOVA, Bonferroni corrected post hoc tests, and t-tests).

Findings

The study yielded the following findings:

Study 1:

- Completeness of items in the drawers increased significantly from the
 - Pre-divider period to two weeks after introduction of the divider (P=0.04)
 - Pre-divider period to 10 weeks after introduction of the divider (P=0.02)
- Standardization:
 - Prior to the introduction of the dividers, items were found in 56 locations other than where they were supposed to be.
 - After the dividers were introduced, items were found in nine locations other than where they were supposed to be.
- Questionnaires:
 - On a 1-7 scale (7 being the highest), nurse participants had a mean satisfaction of 4.08.
 - Nurses who had worked for less than three years in the ICU were more satisfied with the divider than those who had worked for more than three years (P=0.017).
 - There was no difference in satisfaction for the divider when taking into consideration age and years of total work experience.
 - The two aspects of the divider that were most liked: organized and acted as a reminder.
 - The two most disliked aspects of the divider: gets cluttered and requires extra cleaning.



Study 2:

Restocking:

- Participants were significantly faster in restocking the drawer with the divider than the one without the divider ($P < 0.001$).
- It took the participants significantly more time to restock when five to eight items were missing than when one or no items was missing ($P < 0.05$).
- Participants were highly accurate in restocking. However, it was seen that they restocked more accurately when fewer items were missing than when more items were missing ($P < 0.05$).
- Participants rated their workload to be lower when restocking with the divider than without the divider ($P < 0.001$).

Retrieving:

- There was no difference in the time it took participants to retrieve items from either type of drawer.
- The accuracy of retrieving items was very high – the mean: 9.79 (divider); 9.76 (no divider).
- Participants rated that their workload was lower when retrieving with the divider than without the divider ($P = 0.018$).

Questionnaires:

- On a 1-7 scale (7 being the highest), participants noted that –
 - It was easier to use a drawer with a divider than without one ($P < 0.001$).
 - A drawer with a divider required less concentration ($P < 0.001$).
- Of the 24 participants, 23 preferred the drawer with a divider and one liked both ($P < 0.001$).

Limitations

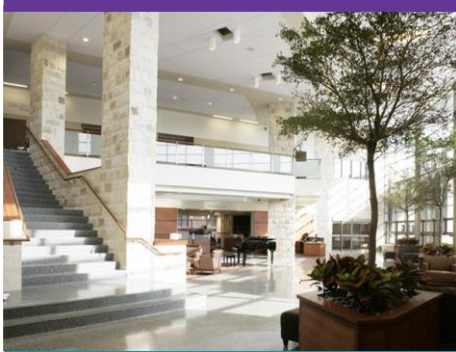
The authors identified the following limitations:

Study 1:

- The repeated completeness analysis of the drawers
- The questionnaire preceded the tenth week completeness analysis.
- The minimal increase in item completeness may have little clinical significance.
- The research board had a notice about the presence of the researchers in the ICU – this may have impacted the behavior of the nurses towards the study.

Study 2:

- The nurse participants had worked with a divider for an average of two years.
- Because of their previous experience with dividers, they might have favored it over not having dividers.



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Design Implications

Furniture designers may consider designing ICU bedside drawers with dividers.

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