Cognitive Load and Influences Experienced by RNs During Medication Delivery

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Background

- Multiple factors contribute to medication errors. These include distraction, interruption, heavy workload, inexperience and neglect.
- Interruptions and distractions place demands on memory and increase cognitive load.
- Nurses are at risk for being interrupted and distracted during every medication pass.
- With increased cognitive loads, nurses can become vulnerable to loss of attention and potential errors.
- A better understanding of these factors as reported and observed by nurses is needed to improve system reliability and prevent medication administration errors.

Objectives

1. Describe the cognitive load RNs experience during medication delivery to hospitalized patients.
2. Explore the extent that interruptions and disruptions occur and add to a nurse’s cognitive load.
3. Investigate the impact of these factors on lapses in procedure and medication error that RNs experience during medication administration.
4. Involve RNs in clinical research about nursing practice and dissemination of findings internally and externally.

Methods

Design: Descriptive, correlational, multi-site, virtual network study. PIs Drs. Thomas and Donahue-Porter. Network study sponsored and coordinated by the Improvement Science Research Network (ISRN).

Sample: 79 total RN participants; 7 RNs at each hospital site on a medical surgical unit. Site demographics: 86% female, average age 41, 57% BSN, full-time status, with average of 12.5 years RN experience.

Unit of analysis: An episode of medication administration (one or more medications) given to one patient; Total episodes 857; Total site episodes 84.

Data collection:

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<th>Data</th>
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<th>Method</th>
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<tr>
<td>Demographics</td>
<td>Demographics Form</td>
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<tr>
<td>Cognitive Load</td>
<td>NASA Task Load Index</td>
<td>RN participant completes</td>
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<td>Interruptions</td>
<td>Structured Observation Sheet</td>
<td>Direct observation by 2 trained RN observers</td>
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<tr>
<td>Distractions</td>
<td>Self-Report: Distraction During Med Administration</td>
<td>RN participant completes</td>
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Analysis: Generalized linear mixed modeling for hierarchical data to assess correlations among distractions and interruptions during medication episodes, and between each cognitive load element with procedural failures and medication errors.

Results

Procedural failures ranged from 37% - 98%; Frequency site total was 8% (71/584) Medication administration errors ranged from 0% to 37%; Frequency site total was 1% (1/98); Frequencies of both varied among hospitals.

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An interruption and the number of interruptions were related to perceived cognitive load: mental demand, temporal demand, effort and frustration (p ≤ 0.05).

Distractions during medication administration were associated with high perceptions of cognitive load: Mental demand, temporal demand, physical demand, effort and frustration levels (p = 0.0024).

Number of meds administered were associated with risk of error and procedural failure (p = 0.034; p = 0.005).

RN age was associated with medication administration error risk (p= 0.032) but not procedural failure.

Distractions or interruptions or any aspect of cognitive load were not significantly related to the risk of making a medication administration error or a procedural failure.

Conclusion

- RNs encounter challenging demands during medication delivery on M/S units in acute care hospitals.
- Knowledge about interruptions, distractions and cognitive load can inform safeguards and best practices to reduce the demands on RNs.
- Addressing the well-being of healthcare providers has been identified as important enough to change the Triple Aim to the Quadruple Aim (Bodenheimer & Sinsky, 2014).