



The relationship between interruption content and interrupted task severity in intensive care nursing: an observational study



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ABSTRACT

Background: In a previous study, we observed that the majority of interruptions experienced by nurses in a cardiovascular intensive care unit (CVICU) carried information directly related to their patient or other aspects of work affecting other patients or indirectly affecting their patient. Further, the proportion of interruptions with personal content was significantly higher during low-severity (in case of an error as defined by nurses) tasks compared to medium- and high-severity tasks suggesting that other personnel may have evaluated the criticality of the nurses' tasks before interrupting. However, this earlier study only collected data when an interruption happened and thus could not investigate interruption rate as a function of primary task type and severity while controlling for primary task duration as an exposure variable.

Objectives: We addressed this methodological limitation in a second observational study that was conducted to further study interruptions and also to evaluate an interruption mitigation tool. The data from the baseline condition (i.e., no tool) is analyzed in this paper to validate the results of our previous study and to report interruption rates observed during tasks of varying severities (low, medium, high), with a particular focus on comparing different interruption contents.

Design and setting: The study was conducted in a 24-bed closed CVICU at a Canadian hospital, during day shifts.

Participants: The baseline condition involved thirteen nurses.

Methods: Over a 3-week period, three researchers observed these nurses 46–120 min each, with an average of 89 min. Data were collected in real time, using a tablet computer and software designed for this purpose. The rate of interruptions with different content was compared across varying task severity levels as defined by CVICU nurses.

Results: Nurses spent about 50% of their time conducting medium-severity tasks (e.g., documentation), 35% conducting high-severity tasks (e.g., procedure), and 14% conducting low-severity tasks (e.g., general care). The rate of interruptions with personal content observed during low-severity tasks was 1.97 (95% confidence interval, CI: 1.04, 3.74) and 3.23 (95% CI: 1.51, 6.89) times the rate of interruptions with personal content observed during high- and medium-severity tasks, respectively.

Conclusions: Interrupters might have evaluated task severity before interrupting. Increasing the transparency of the nature and severity of the task being performed

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may help others further modulate when and how they interrupt a nurse. Overall, rather than try to eliminate all interruptions, mitigation strategies should consider the relevance of interruptions to a task or patient as well as their urgency.

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What is already known about the topic?

- Intensive care unit nurses get interrupted frequently; however, majority of the interruptions they receive may convey task- or patient-related information and thus have positive implications.
- There is some evidence suggesting that the proportion of interruptions with personal content is higher during low-severity (severity in case of an error) tasks compared to medium- and high-severity tasks. This indicates that other personnel may evaluate the criticality of the nurses' tasks before interrupting.

What this paper adds

- Not only are medium and high-severity tasks conducted frequently by ICU nurses, they also receive more interruptions than low-severity tasks. Thus, efforts should be made to minimize interruptions that could lead to errors, especially for high-severity tasks.
- Controlling for exposure (i.e., time spent performing different primary tasks), the rate of interruptions (per hour) with personal content is significantly higher during low-severity tasks compared to medium- and high-severity tasks. This finding provides support for the efficacy of tools or methods, which can improve the awareness of other personnel of the tasks performed by nurses.

1. Introduction

Interruptions experienced by intensive care unit (ICU) nurses are being studied widely due to their prevalence (Tucker and Spear, 2006) and their potentially negative effects on nurses' performance (Ballermann et al., 2010; Drews, 2007; Grundgeiger et al., 2010). However, not all interruptions are necessarily negative, and in certain contexts, ICU nurses may benefit from interruptions that communicate information related to patients, tasks, or decisions-at-hand (Coiera and Tombs, 1998; Grundgeiger and Sanderson, 2009; Rivera-Rodriguez and Karsh, 2010; Sasangohar et al., 2012; Walji et al., 2004). For example, ICU alarms (e.g., from intravenous pumps) can indicate an off-normal condition that needs immediate attention, or a nurse can interrupt another nurse to communicate an important event (e.g., patient arrival, hand-overs).

An earlier study we conducted in a Canadian Cardiovascular ICU (CVICU) revealed that the majority of the observed interruptions conveyed patient- or work-related content (Sasangohar et al., 2014). Therefore, mitigation strategies aimed at blocking interruptions with no consideration for interruption content may disrupt the communication of potentially important information. Overall, the interactions between the context in which

interruptions happen (e.g., sources of interruption, tasks being interrupted), the interruption content (e.g., information conveyed, purpose of interruption), and the interruption characteristics (e.g., frequency and duration) can provide insights into developing more situation-specific mitigation approaches (Sasangohar et al., 2014). For example, non-urgent, non-task-relevant interruptions should be delayed or blocked during high-severity or highly critical tasks, whereas urgent or task-relevant interruptions might be allowed during low-severity tasks that are not as critical.

In our earlier CVICU study (Sasangohar et al., 2014), we observed that the staff's (e.g., nurses, MDs, other services) interruption behavior varied as a function of primary task severity (high, medium, or low) and interruption content (personal, patient-related, or work-related). To define the former variable, four experienced nurses were asked to categorize CVICU tasks as having high-, medium-, or low-severity outcomes in case of an error. The nurses responded individually, and the mode response was chosen for task severity. Overall, the proportion of interruptions with personal content was observed to be higher during low-severity tasks, compared to medium- and high-severity tasks. These results reveal a certain level of intuitive task-severity awareness among the interrupters, suggesting that a deliberate attempt at making task severity more transparent may help others modulate when and how they interrupt a nurse. However, this earlier study had a significant limitation in that the primary tasks were only recorded when an interruption happened and thus did not capture the prevalence of non-interrupted tasks. Previous studies have shown variation in the percentage of time nurses spend performing different ICU tasks. For example, Keohane et al. (2008) reported that about 10% of ICU tasks they observed were documentation, whereas Wong et al. (2003) reported documentation to be around 35%.

This methodological limitation was addressed in a second observational study conducted at the same CVICU. In this second study, we collected contextual information about the nurses' primary tasks in addition to the interruptions they experience in order to assess whether occurrence of interruptions varies as a function of primary task severity and interruption content. The overall objective of this second study was to further investigate interruptions and to also evaluate the effectiveness of an interruption mitigation tool, which was installed in one of the 24 rooms of this CVICU. The baseline data (i.e., data collected in 11 rooms without the tool) are used in this paper to validate the findings of the first observational study and also to report the make-up of different ICU tasks we observed. The findings on the effectiveness of the mitigation tool are presented in Sasangohar et al. (in press).

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