

ABSTRACT

Introduction

Medication errors more frequently occur in a neonatal intensive care setting, and most of these errors occur during the administration phase of medication use process (MUP) (Krzyzaniak and Bajorek, 2016). Administration errors during continuous intravenous infusions especially high-risk infusions can be detrimental to already sick individual in the critical care unit (Alanazi *et al.*, 2016). Several health information technologies (HIT) are emerging to intercept these errors. However, implementation of these technologies brings changes in clinical workflow due to lack of integration with existing systems that eventually increase the clinicians' workload and lead to unintended consequences. The national system -Maternal and newborn electronic health record (EHR) will be implemented in the study unit in the last quarter of 2017. This dissertation aimed at appraising the clinical workflow at the administration phase of high-risk infusions in upcoming maternal and newborn EHR in a simulated environment.

Study design and methods

Clinical simulation method was utilised to identify the type of potential errors and the severity to cause potential harm, that could arise due to change in the clinical workflow in upcoming maternal and new-born EHR. Thirty-one simulation sessions were conducted in March- April 2017. The nurses working in the NICU, Rotunda Hospital, participated in the study. Participants were asked to retrieve the information from the computer screen, cross-checked against medication protocol, prepare syringe labels and program the pump. Data was collected using mixed method approach. Quantitative data was gathered on set forms to identify errors at the administration phase. Qualitative data was collected in the form of a post-simulation survey to explore the perceptions of the participants about the administration process. The researcher observed the simulation session to gain the insight of administration process.

Results

Out of 155 prescription orders, thirty-one prescription orders had either programming error (n=11, 7%) or wrong labelling parameters (n=12, 7.7%) or both programming error and wrong labelling parameter (n=8, 5.2%). All the syringe labels had one or more missed labelling parameters. 89% of all the programming errors belongs category 'C' and category 'D' on NCC-MERP index of medication errors. More than half (52.6%, n=10, N=19) of the infusion orders with programming errors led to more than $\pm 10\%$ deviation from the prescribed dose, and 77%(n=7, N=10) of these deviations were due to programming wrong concentration. Further, logistic regression analysis showed that increase in labelling errors increases the likelihood of programming errors.

Conclusion

Taken together, these results suggested that the changes (need of computation of concertation and preparing syringe labels) in the workflow at the administration phase of high-risk infusions in future EHR primed to serious errors that can be detrimental in the real clinical setting. This study strongly suggested to include concertation in the prescription order, and either has printed syringe labels or standard labelling template to enhance patient safety. Further research is required to evaluate the clinical workflow in a real clinical setting using the actual system.