



**Service Priorities and Programmes**  
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**Improving medication administration safety in Intensive Care Unit (ICU) via behavioral change with simulation-based training**

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**Keywords:**

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**Introduction**

Medication errors are a significant cause of patient morbidity and mortality in ICU. Medication administration, as the last step in the medication use process, is particularly susceptible to human errors because of paucity of system checks. Simulation-based training is increasingly used as an alternative teaching method to didactic lectures in medicine. It provides a realistic and interactive learning environment that promotes communication and the exercise of real-time judgment, potentially resulting in better comprehension of the material and increased proficiency of task execution.

**Objectives**

To increase the ability of the nurses to: 1) comply with the all the necessary and appropriate steps of medication administration 2) use effective communication strategies between nurses and other staff to prevent medication errors 3) facilitate the detection of potential medication errors

**Methodology**

A simulation-based training program for nurses was developed by a team of ICU doctors and nurses. It consisted of 3 clinical scenarios based on frequently occurring medication errors in ICU. ICU nurses approached each scenario as if they were working in ICU. Debriefing was conducted afterwards. 29 identical training sessions were conducted in 2Q 2013. 74 nurses (86% of total ICU staff) participated. All nurses filled up questionnaires before and after the training.

**Result**

The years of working experience of the participants ranged from less than 5 years to more than 20 years (<5 years =19(25.7%), 5 - <10 years =12(16.2%), 10 - <15 years = 15(20.3%), 15 to < 20 years = 13(17.6%), >20 years = 15(20.3%). The self-rated score of nurses of their ability to comply with all the necessary and appropriate steps of medication administration increased significantly after the training (3.82 +0.48 vs 4.19+0.57,  $t(73) = -5.83$ ,  $p<0.005$ ). The self-rated score of nurses of their ability to communicate effectively with nurses and other staff using the SBAR framework

increased significantly after the training (3.11 +0.71 vs 4.27+0.53,  $t(73) = -13.85$ ,  $p<0.005$ ). The self-rated score of nurses of their ability to speak up and clarify queries during medication administration to prevent medication errors increased significantly after the training (3.85 +0.61 vs 4.30+0.57,  $t(73) = -5.77$ ,  $p<0.005$ ). The self-rated score of nurses of their ability to recognize potential medication errors increased significantly after the training (3.61 +0.62 vs 4.23+0.56,  $t(73) = -7.28$ ,  $p<0.005$ ). 94.6% of the nurses were satisfied with the program. 94.6% of them agreed what they learned from the program can be applied to real practice and 96.0% agreed it was able to facilitate decision-making during medication administration. 95.9% of nurses agreed simulation-based training was more useful than lecture-based training for the program. Most importantly, the incidence of medication incidents in ICU was reduced to zero since the launch of the program. To conclude, this simulation-based training program was successful to improve the medication administration safety in ICU by building confidence of nurses to comply with all the necessary and appropriate steps of medication administration, use effective communication strategies between nurses and other staff to prevent medication errors and facilitate the detection of potential medication errors. The incidence of medication incidents in ICU was reduced to zero since the launch of the program.