Brief Communication

Preventive Risk Assessment of Medication in Intensive Wards

Hadi Hayati[1,2], Majid Piramoon[1,3]

[1]Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran, [2]Department of Pharmacoeconomics and Management, School of Pharmacy, Lorestan University of Medical Sciences, Khorramabad, Iran, [3]Department of Nuclear Pharmacy, Lorestan University of Medical Sciences, Khorramabad, Iran

Abstract

Background: Failure mode and effect analysis (FEMA) approach as one of the preventive risk management strategies to identify and prevent errors in the medication process in nursing care in the 10 intensive wards in two large hospitals in Khorramabad. **Methods:** This study is applied descriptive research, which is conducted as a mixed-method quantitative-qualitative approach using focus group discussion. **Results:** The average risk priority number (RPN) score for the intensive care unit (ICU) in this study was 20.97. The highest RPN scores were associated with the SICU (Surgical ICU) and EICU (Emergency ICU) wards with RPN of 24.66 and 22.71, respectively. Among the steps of the medication process, the first step "physician order" had the highest score (RPN = 26.08). **Conclusions:** The intensive wards, which had high RPN scores are exposed to more risk of the drug medication process like EICU and SICU; also, simple acts such as handwriting readable by a physician can considerably reduce risk in the ICU.

Keywords: *Intensive care, pharmaceutical preparations, risk assessment*

Introduction

The intensive care unit (ICU) is one of the most important wards in any hospital, where patients are admitted for acute disorders and necessitate meticulous and rigorous medical and nursing care.[1] There are numerous techniques for detecting medication mistakes.[2] The "failure mode and effects analysis (FMEA)" is one of these methodologies, which anticipates and prevents errors.[3,4] Because of the good performance and reliability of this comprehensive quality management program, it is used by managers to analyze and identify risk factors of new medical policies even before implementation.[5,6] Therefore, due to the importance of the ICU ward, we decided to assess the preventive risk of medication therapy in total ICU wards of Shahid Rahimi and Ashayer hospitals affiliated to Lorestan University of Medical Sciences in Khorramabad in 2022.

Methods

This study is applied descriptive research, which is conducted as a mixed-method quantitative-qualitative approach using focus group discussion (FGD). The first step is identifying the owners of medication processes in the ICU wards to the formation of the FMEA team. In this study, the team included 10 individuals who were familiar with the medication processes of the intensive wards of the hospitals. Next, the team brainstormed to characterize failure modes to the standard worksheet of the FMEA technique were extracted. In the next step, using the standard worksheet extracted from the team's point of view, the samples were distributed among all the members in the ICU (which included 112 people in the whole sample), and their opinions were applied using the relevant protocols. The team determined nine working steps in the medication process after several meetings. After that, a numerical value (From 1 to 5) was given to each step, based on the risk priority number (RPN) index. According to the FMEA methodology, the final RPN score is the product of three indicators and includes severity(S), frequency(F), and detectability(D)(RPN = S*F*D). In the end, general Excel and SPSS21 software were used for data analysis.

Results

Based on the calculations the total RPN was 20.97. So that according to Figure 1, the total RPN for the ICU part of Shahid Rahimi Hospital was 18.86, and the RPN of Ashayer Hospital was 22.83. We found that in the Shahid Rahimi hospital, the EICU ward had the highest (RPN = 22.71)

How to cite this article: Hayati H, Piramoon M. Preventive risk assessment of medication in intensive wards. Int J Prev Med 2023;14:117.

Address for correspondence:
Dr. Hadi Hayati, Razi Herbal Medicines Research Center, Lorestan University of Medical Sciences, Khorramabad, Iran.
E-mail: Hadihayati88@gmail.com

Access this article online

Website: www.ijpvmjournal.net/www.ijpm.ir

DOI: 10.4103/ijpvm.ijpvm_290_22

Quick Response Code:

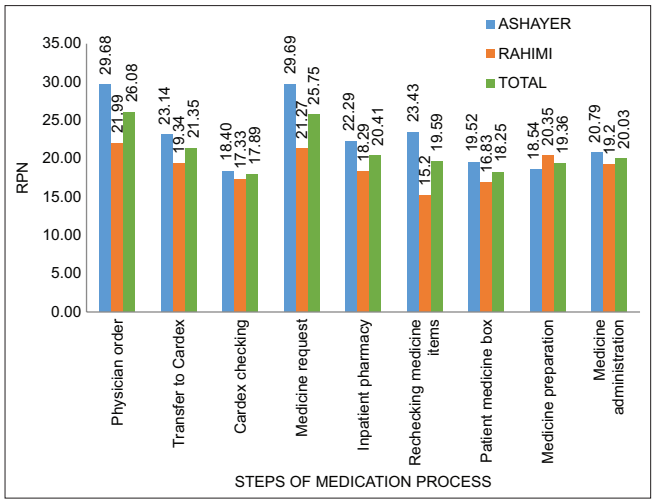

Figure 1: RPN score of nine steps of medication treatment in total ICUs for each hospital. RPN = Risk priority number, ICU = Intensive care Unit

score [Figure 2]. Also, as can be seen, the SICU ward had the highest (RPN = 24.66) score. Among the nine steps of the medication process, the physician order step (first step) with RPN = 26.08 has the highest impact on total RPN.

Discussion

We discovered that the "physician order" step is the most crucial in all ICU wards owing to "unreadable prescription." In one study, it was found that simple efforts such as "adding color codes to dispensing labels, incorporating dosage information on dispensing labels, redesigning and repackaging medications, and rearranging the distribution figure" are effective in preventing medicine errors.[7] Re-checking and monitoring each process, we feel, will have a stronger impact on reducing prescription errors. Although it should be mentioned that in some wards, poor speech communication among professionals is one of the major causes of medical errors. Similar to our findings, Benjamin believed that inadequate oral communication is a reason for many medication errors.[8] So pharmaceutical treatment has a crucial role in improving patient conditions, particularly in the ICU, it is also critical to identify failure modes in this ward and avoid potential risks.

Authorship contribution statement

HH contributed to the research designing, data gathering, analysis, and writing. MP contributed to writing – reviewing and editing.

Acknowledgments

The authors thank the directors of the Hospitals and all the head nurses.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

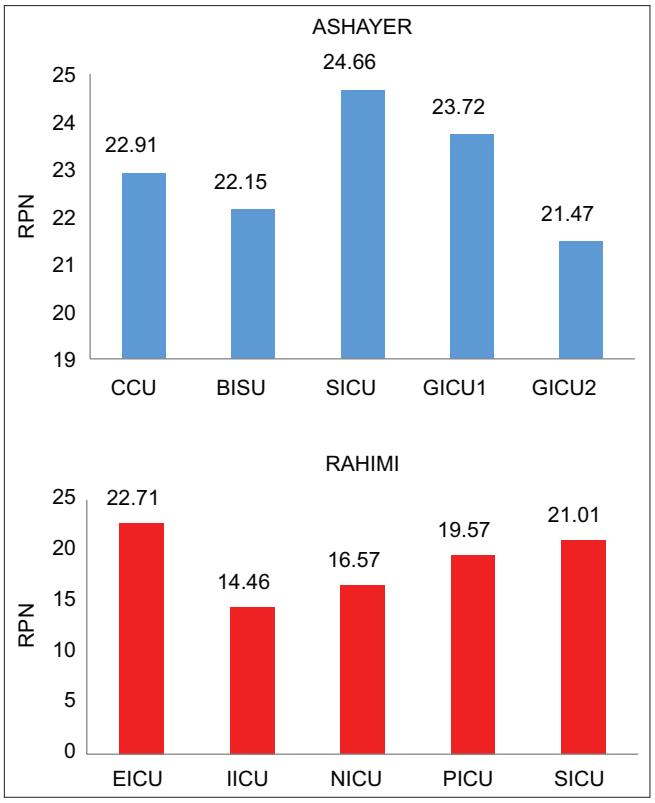

Figure 2: Total RPN score of each ICU in the sample's. RPN = Risk priority number, CCU = Coronary care unit, BISU = Burn intensive care unit, SICU = Surgical intensive care unit, GICU1 = General intensive care unit 1, GICU2 = General intensive care unit 2, EICU = Emergency intensive care unit, IICU = Intermediate intensive care unit, NICU = Neonatal intensive care unit, PICU = Pediatric intensive care unit, ICU = Intensive care unit

Received: 29 Aug 22 **Accepted:** 16 Feb 23
Published: 28 Sep 23

References

1. Lin L, Wang R, Chen T, Deng J, Niu Y, Wang M. Failure mode and effects analysis on the control effect of multi-drug-resistant bacteria in ICU patients. Am J Transl Res 2021;13:10777-84.
2. Haroun A, Al-Ruzzieh MA, Hussien N, Masa'ad A, Hassoneh R, Abu Alrub G, *et al*. Using failure mode and effects analysis in improving nursing blood sampling at an international specialized cancer center. Asian Pac J Cancer Prev 2021;22:1247-54.
3. Chiozza ML, Ponzetti C. FMEA: A model for reducing medical errors. Clin Chim Acta 2009;404:75-8.
4. Morelli P, Vinci A, Galetto L, Magon G, Maniaci V, Banfi G. FMECA methodology applied to two pathways in an orthopaedic hospital in Milan. J Prev Med Hyg 2007;48:54-9.
5. Apkon M, Leonard J, Probst L, DeLizio L, Vitale R. Design of a safer approach to intravenous drug infusions: Failure mode effects analysis. Qual Saf Health Care 2004;13:265-71.
6. Jafarzadeh Ghoushchi S, Dorosti S, Ab Rahman MN, Khakifirooz M, Fathi M. Theory-based failure modes and effect analysis for medication errors. J Healthc Eng 2021;2021:5533208.
7. Anjalee JAL, Rutter V, Samaranayake NR. Application of failure mode and effect analysis (FMEA) to improve medication safety: A systematic review. Postgrad Med J 2021;97:168-74.
8. Benjamin DM. Reducing medication errors and increasing patient safety: Case studies in clinical pharmacology. J Clin Pharmacol 2003;43:768-83.