Comparative Pharmacy Medication Near-Miss Analysis using Root Cause Analysis (RCA) versus Human Factors Analysis Classification System (HFACS)

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∞ INTRODUCTION

Since 2014, KK Women's and Children's Hospital (KKH) has initiated emphasis on "Targeting Zero Harm" as part of patient safety to actively identify and mitigate risk. Investigation of medication near misses is an integral part in identifying causes and to prevent future errors, which is often overlooked and not analysed systematically.

∞ AIM

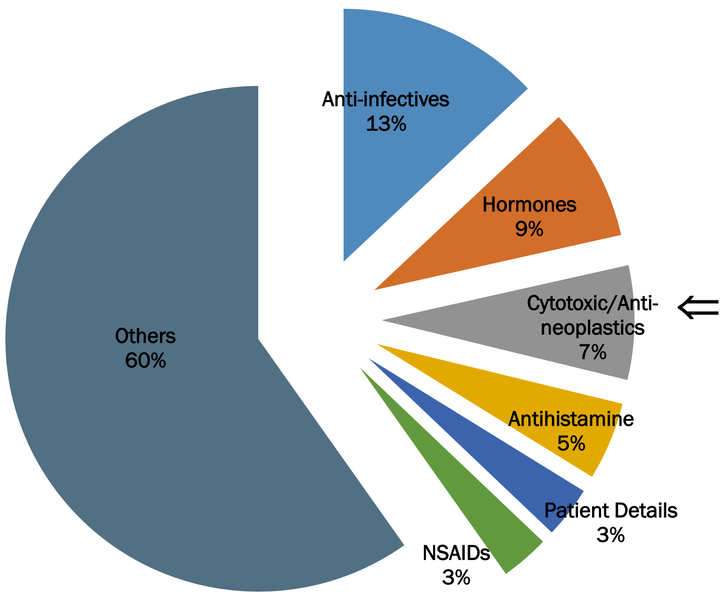
- Classify common and significant medication near misses in pharmacy department using both Root Causes Analysis (RCA) and Human Factors Analysis Classification System (HFACS) methodologies
- Evaluate the similarities between RCA and HFACS
- Explore the feasibility of combining both methodologies into a singular tool for use in future analyses of near misses

∞ METHODS

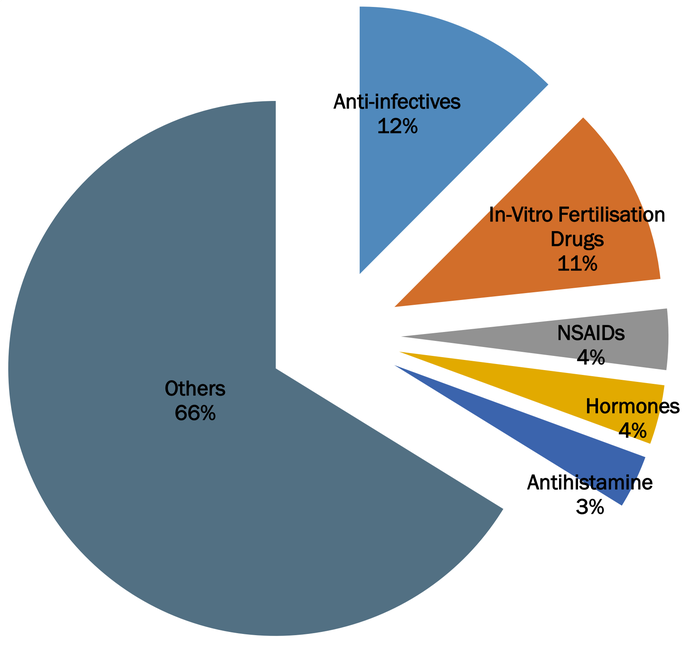
- A list of near misses deemed common and/or significant were shortlisted and interviews were conducted with the staff involved to elicit facts of the incident
- Using both RCA and HFACS methodologies separately, factors contributing to the near misses were identified
- A correlation analysis between the RCA and HFACS factors was performed using R Programming to determine any similarities between the two methodologies in the investigation of near misses

∞ RESULTS

Phase I: Retrospective Analysis of Pharmacy Near Miss Data



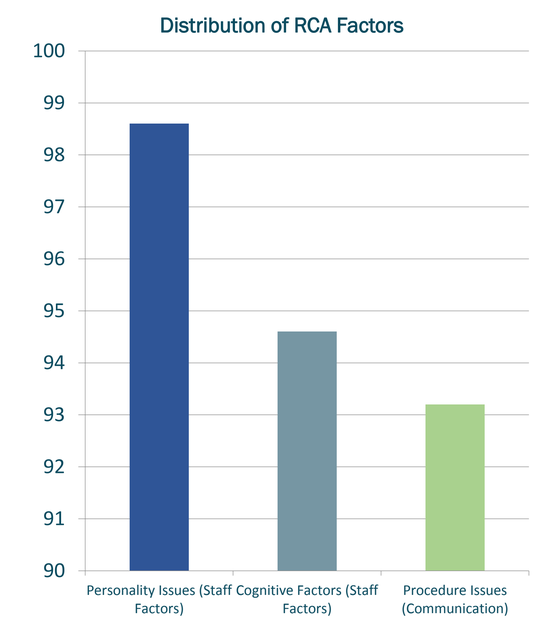
Near Misses that First Occurred at the Typing Stage ⇐

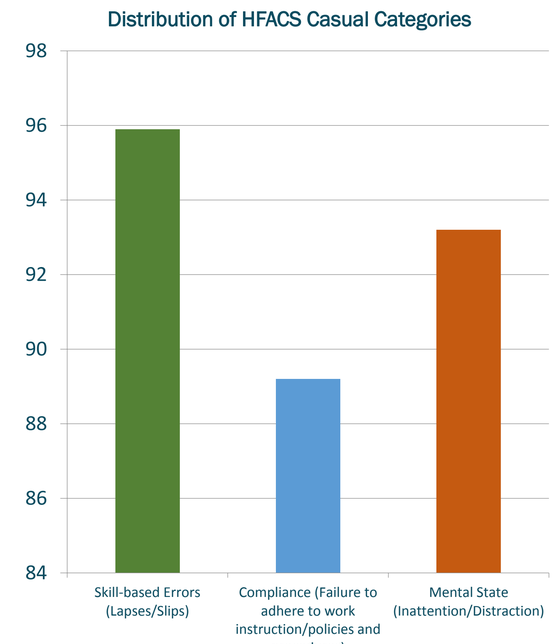


⇒ Near Misses that First Occurred at the Packing Stage

Phase II: Prospective Interviews with Staff Involved in Near Miss

A total of 112 near misses were shortlisted and only 74 interviews were conduction due to a) Staff was unable to remember the full details of the near miss event, b) Staff had permanently left the institution, c) Staff involved in the near miss was not documented or d) Interviewer was unable to find a suitable time to interview staff.





Correlation between RCA and HFACS

Table 1: Positive correlations observed between the RCA and HFACS. (Yellow = Strong. Orange = Weak)

RCA Factors	HFACS Casual Categories
RCA Staff Factors – Physical Issues (Code X7)	HFACS Preconditions for Unsafe Acts– Conditions of Healthcare Professionals – Physical State (Code I)
RCA Staff Factors – Cognitive (Code X8)	HFACS Preconditions for Unsafe Acts – Conditions of Healthcare Professionals – Mental State (Code H)
RCA Staff Factors – Personality Issues (Code X10)	HFACS Unsafe Acts – Errors – Skill-based Errors (Code A)
RCA Task Factors – Guidelines, Policies and Procedure Issues (Code X11)	HFACS Organisational Influences – Resource Management – Equipment/Facilities Resources (Code O)
RCA Equipment – Integrity (Code X23)	HFACS Preconditions – Environmental Factors – Technological (Code F)
RCA Communication – Communication Management (Code X15)	HFACS Preconditions – Personnel Factors – Communication (Code G)
RCA Communication – Verbal Communication (Code X17)	HFACS Preconditions – Personnel Factors – Communication (Code G)
RCA Communication – Communication for Med-related Incidents (Code X18)	HFACS Preconditions – Personnel Factors – Communication (Code G)
RCA Communication – Written Communication (Code X19)	HFACS Preconditions – Personnel Factors – Communication (Code G)

∞ DISCUSSION

Our results show that there are similarities between RCA and HFACS and it is possible to combine both into a singular tool.

However, this study has its limitations:

- Possible introduction of bias during interview as only one investigator was involved due to limited manpower
- Did not include all the shortlisted near misses for interview due to time constraint
- Future studies can expand to include all the pharmacy-related near misses for better analysis of the similarities between the two methodologies, so that the new singular tool can be improved and validated.

∞ CONCLUSION

The development of a singular tool combining both frameworks overcomes the weaknesses of each framework when used alone. With our results, formulation of a singular tool that combines the strengths of both methodologies is achievable.