

Understanding smart pump guardrails compliance in the paediatric department at a single site: A quality improvement survey.

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INTRODUCTION

Dose error reduction software (DERS) or commonly referred to as “guardrails” are incorporated in smart pumps and have been identified to prevent administration errors.^{1,2} Guardrails work by applying pre-programmed dose, rate, and concentration limits that alert clinicians when infusion parameters fall outside safe ranges.^{1,2}

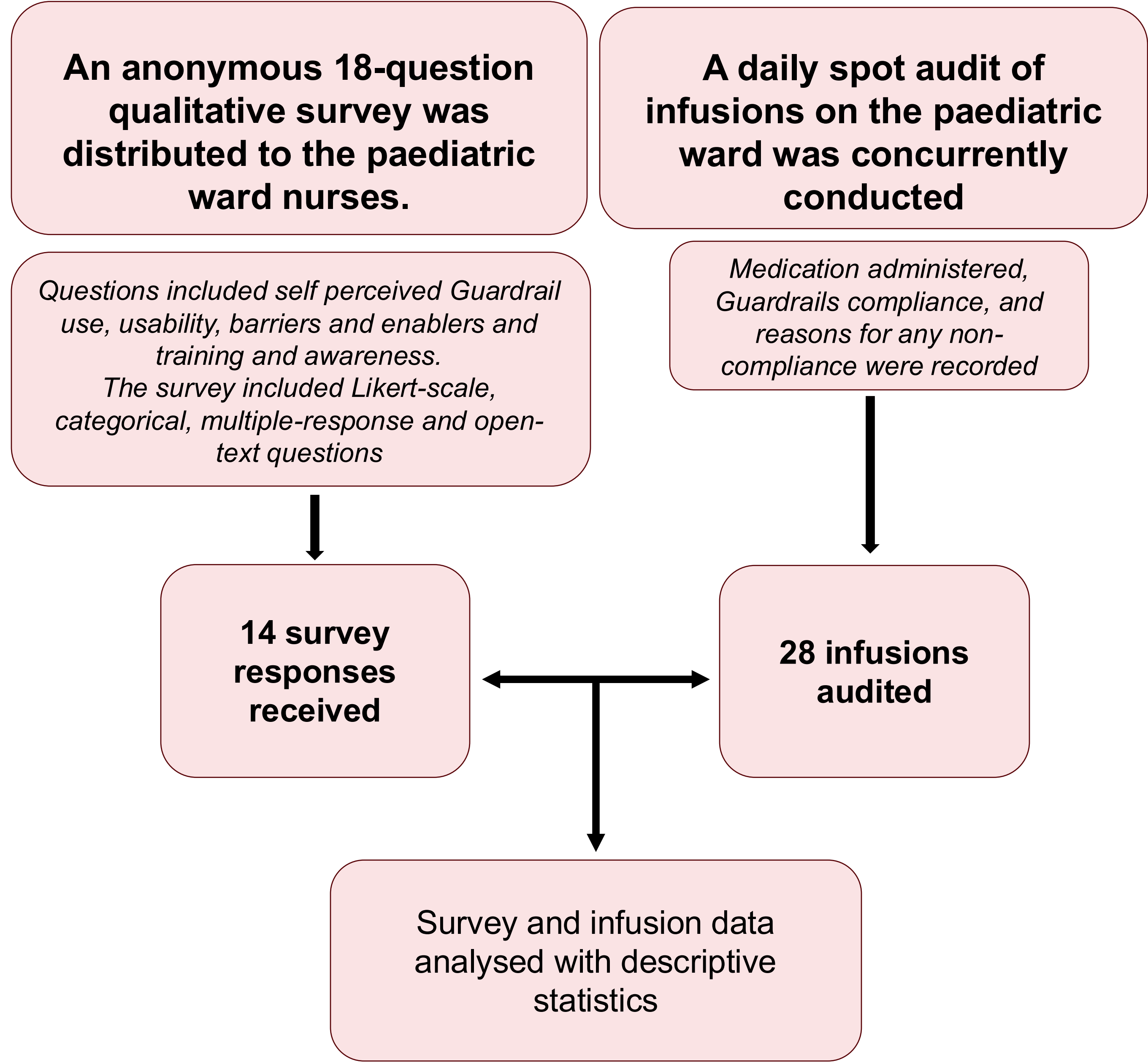
Paediatric populations are vulnerable to infusion-related medication errors due to weight-based dosing, small dose volumes, frequent dose adjustments, and the use of high-risk intravenous medications.³

Despite the known benefits of guardrails, they are frequently bypassed, including using blank (no drug) infusions.³ Prior compliance audits in the Cabrini Hospital paediatric ward demonstrated approximately 75% to 85% guardrail utilisation. Victorian Therapeutic Advisory Group (VicTAG) recommends that 95% of all infusions should be administered using Guardrails where a drug library exists.¹

AIM

To identify perceived barriers and reported behaviours to guardrail use within the paediatric setting

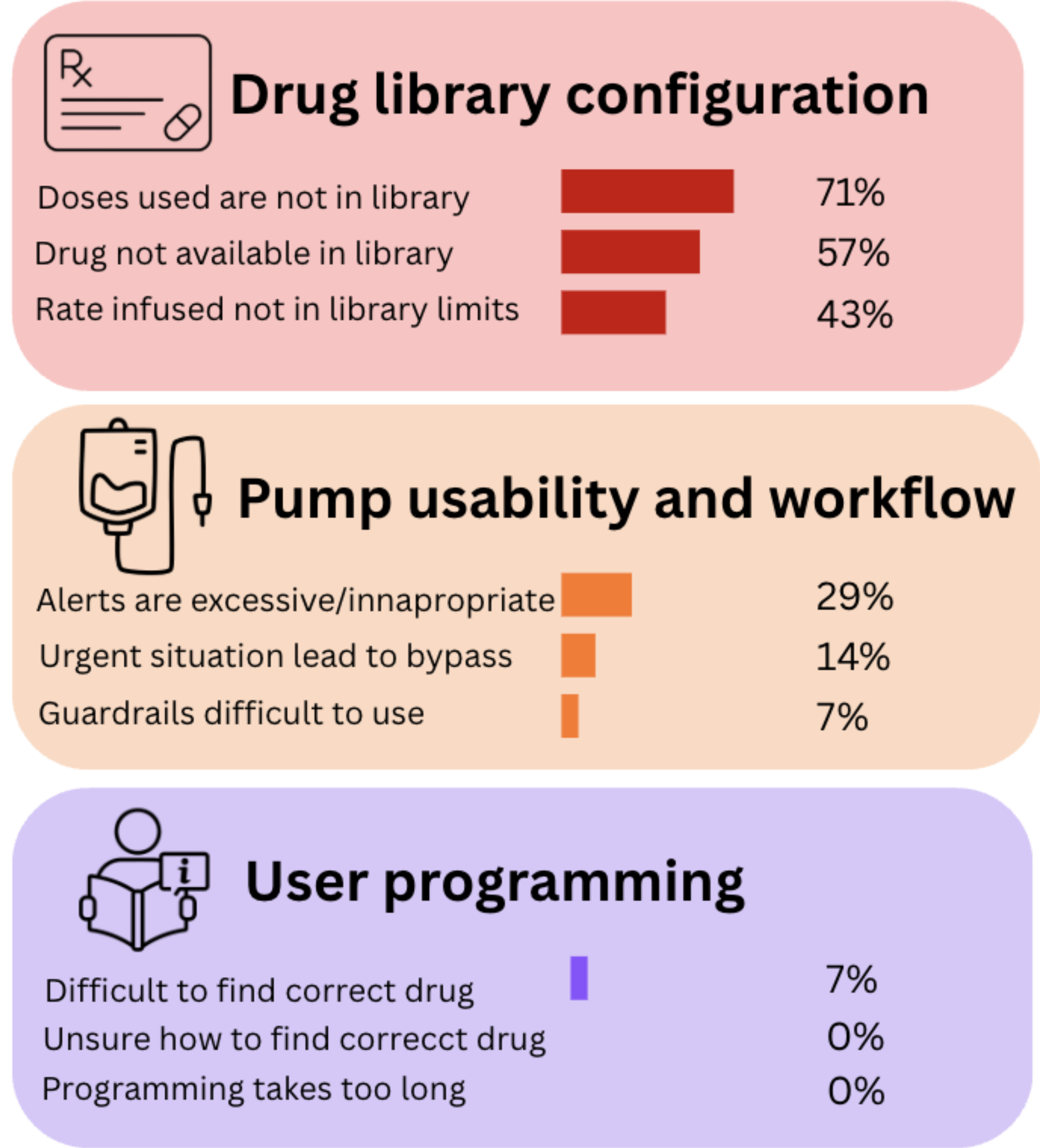
METHOD



RESULTS

A total of 14 nurses (78%) responded to the survey, including 5 (36%) with less than five years of experience. Spot audit results identified that 20 of 28 (71%) infusions utilised guardrails. Of the 8 infusions without guardrails, 4 of these were cefazolin infusions.

Figure 1: Barriers of Guardrails usage among paediatric nurses



RESULTS

Figure 2: Percentage of nurses reporting a drug library barrier

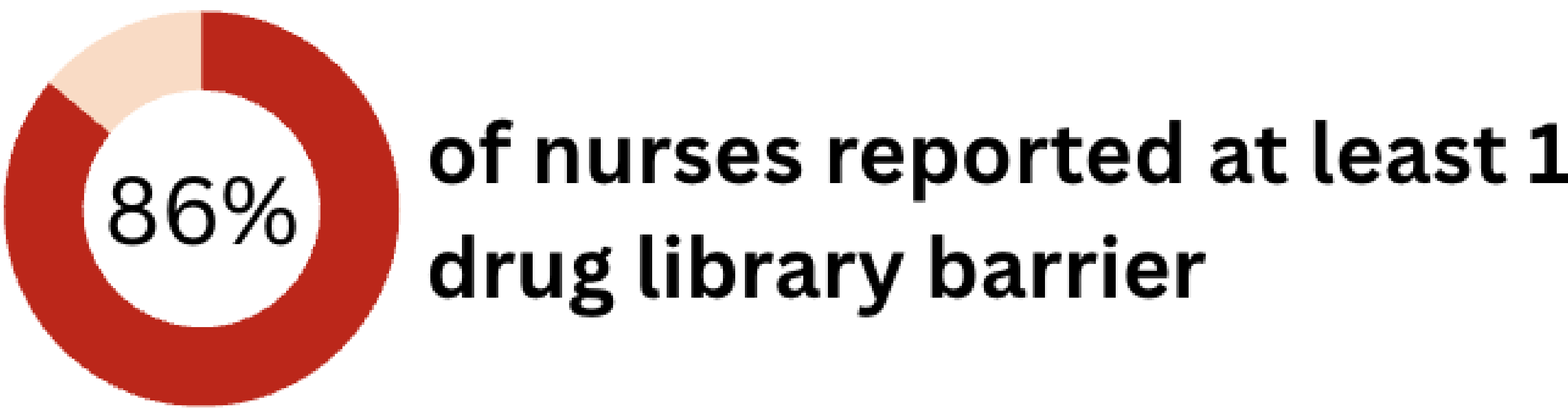
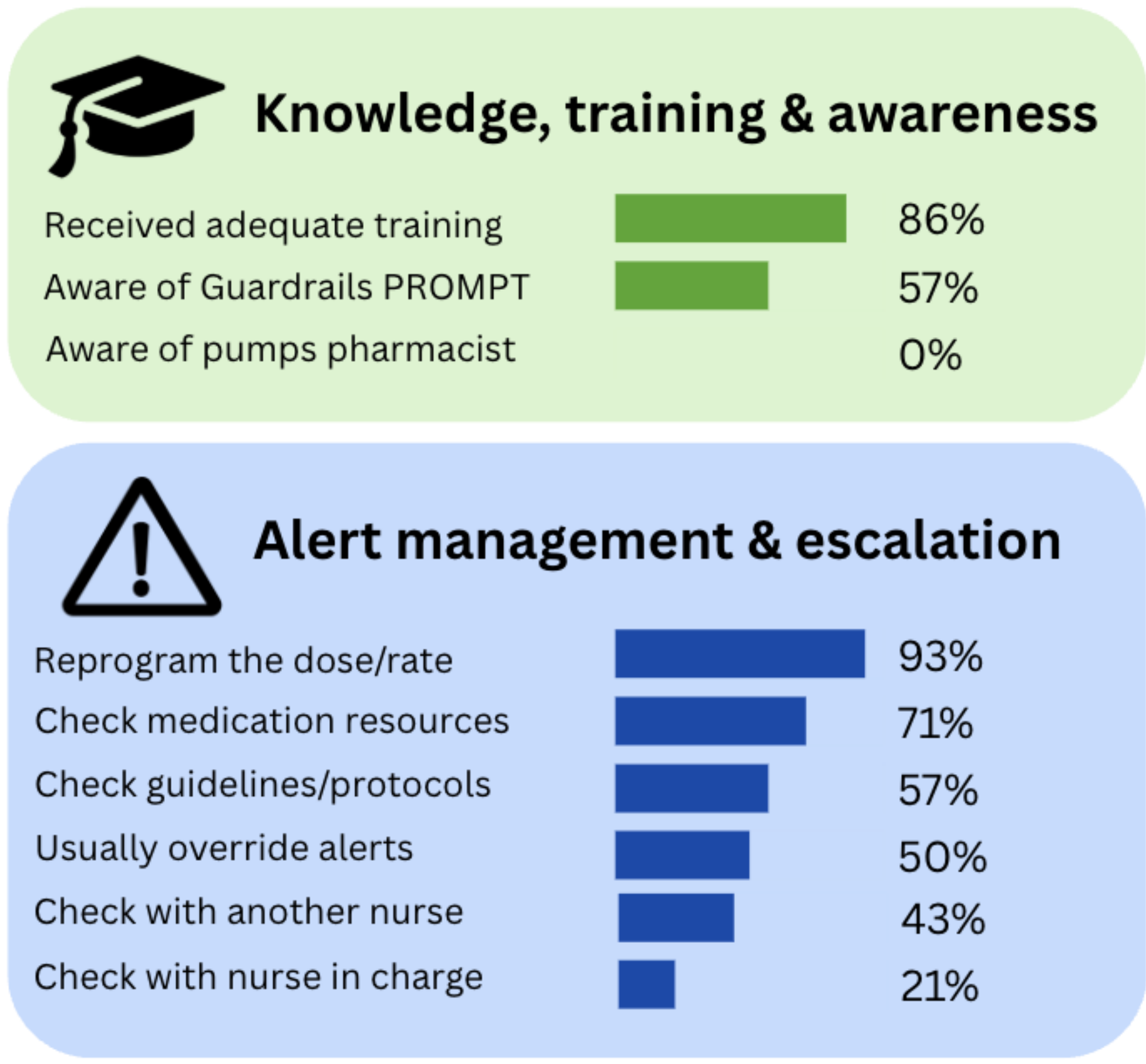


Figure 3: Enablers to Guardrails usage among paediatric nurses



DISCUSSION

Respondents reported drug library configuration as the most common barrier to Guardrails use, consistent with previous surveys examining barriers to Guardrails compliance.⁴ Paediatric drug library configuration often requires weight-based dosing and additional input parameters, increasing the complexity of configuration compared with adult practice. Missing or inappropriate dose settings have previously been identified as major contributors to DERS non-compliance.⁴

Awareness of existing support and escalation pathways was limited, including the role of the PUMPS pharmacist and escalation to senior nursing staff. This may contribute to drug library issues remaining unresolved and ongoing non-compliance with Guardrails. Previous implementation of a pharmacy-led drug library reporting tool has been associated with increased Guardrails compliance.⁵

Implications:

- A clear and visible pathway for nursing staff to report drug library issues to pharmacy may facilitate timely review and modification of the drug library. Increasing awareness of the PUMPS pharmacist and pharmacy’s role in drug library maintenance may support greater use of Guardrails in paediatric practice.

Limitations:

- The small sample size and single-site design limit the generalizability of the findings. Survey questions were not formally validated, and self-reported confidence and practices may be subject to recall and response bias.

CONCLUSION

Optimising the Guardrails drug library configuration to reflect paediatric clinical practice may support its integration into routine practice. Clear escalation pathways and ongoing pharmacy–nursing collaboration may support the timely identification and resolution of drug library issues.

REFERENCES

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