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Reducing Medication Errors through Multi-Disciplinary Collaboration: A Quality Improvement initiative

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ABSTRACT

Introduction:
Prescribing and medication administration errors are common themes in Pediatrics. There is growing international evidence that the regular occurrence of such errors carries a high potential for unintended harm to patients. Within our Trust, a high percentage of reported pediatric incidents relate to medication errors. The most-commonly reported themes were incorrect dosing and omission of regular medication. The aim of our project was to reduce medication errors by at least 10%.

Materials and Methods:
To achieve our aim, we devised a structured educational program was devised by a tripartite alliance (Nursing, Medicine, Pharmacology) and rolled out to nursing staff and medical trainees. An initial prospective audit was undertaken, followed by two PDSA (Plan-Do-Study-Act) cycles.

Results:
Following the intervention, the percentage of medication errors decreased from 89.3% to 12.1%, with a comparative 51.3% decrease in significant errors and a complete elimination of serious/potentially lethal errors.

Conclusion:
In view of our results, we hope that tripartite alliances may be used as a model for inter-professional collaboration across healthcare systems.

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Introduction

Prescribing and medication administration errors are common themes in Pediatrics. Within our hospital, a high percentage of reported pediatric incidents relate to medication errors. Internationally, multiple studies have shown that the regular occurrence of such errors carries a high potential for unintended harm to patients (1).

Multiple papers have shown evidence that healthcare professionals are faced with several challenges when prescribing and administering medication to children. These challenges become clear when considering the higher incidence, compared with the adult patient group, of weight-based and body area-based calculations (2). Furthermore, pediatric elixirs often need to be reconstituted from powder (3), and many intravenous medications require dilution from adult doses. All these elements clearly increase the likelihood of a medication error taking place (4,5). Earlier research has suggested that good quality care depends upon different professions working together (6). Our study took place at a busy District General Hospital in South Wales. During the winter months especially, the working environment can become highly pressured. The additional high turnover of junior medical staff and work-related stress is thought to contribute to medication errors.

Reducing medication errors should be a high priority for any pediatric department. Our primary aim was to reduce medication prescription and administration errors by at least 10%, following six months of education. The small incremental change target was made in lines with the principles of quality improvement.

Materials and Methods

Data collection

As a baseline measurement, a prospective audit was undertaken to record the number, nature and severity of reported medication errors over three months (May to July 2016) on the General Pediatric Wards. Errors were classified according to the EQUIP study model (7).

Intervention

Considering prior evidence (6), we strongly believed that reducing the incidence and severity of medication errors would improve patient safety. We believed education was to be at the heart of this change. In order to create an educational program, a pediatric tripartite alliance was formed between Medicine, Nursing and Pharmacology. This alliance was collaboratively led by the Practice Development Nurse, the Pediatric Lead Pharmacist and the local Lead Clinician for medical education (Consultant Pediatrician). As a first step, a study afternoon was arranged to highlight the common themes behind medication errors. A multidisciplinary brainstorming exercise followed, in order to gather practical suggestions. As a result, a structured educational program was introduced. We believed this approach would be practical as the educational program was aimed at both medical and nursing staff and would not represent a pass/fail test. Instead, it would become an educational tool to be used over time to improve the confidence of the prescriber/administrator. No financial burden was placed on the department due to the planning and implementation of the educational program.

PDSA cycle 1

Firstly, all medical trainees were asked to complete a mandatory online module designed by the Royal College of Pediatrics and Child Health (RCPCH). This module provided an overview of pediatric prescribing practice, highlighting common themes leading to errors and reiterating the need for safe prescribing in all clinical circumstances. Secondly, all nursing staff members were encouraged to complete an in-house competency package based around the principles of the "5 Rights" of medication administration (right drug, right dose, right time, right route and right patient).

Finally, the Pediatric Lead Pharmacist introduced an education tool (as advocated by MedsIQ) called "Druggle" (8). This would consist of a multidisciplinary meeting, taking place daily, at the end of the ward round, on the main pediatric ward. The Pharmacist would personally lead this meeting, and highlight areas of good prescribing practice, as well as any medication errors. Nurses and doctors would then have the opportunity to learn from their mistakes in a safe

environment. The data collection period ranged from December 2016 to February 2017.

PDSA cycle 2

In order to assess whether our intervention would be effective over time and with different cohorts of medical trainees and nursing staff, a second PDSA cycle was performed 12 months after the first. The educational program continued to be implemented at regular intervals for all staff members, with each new medical trainee asked to complete the pharmacology module within six weeks of starting the post. The data collection period ranged from December 2017 to February 2018.

Results

In the pre-intervention period, a total of 159 children were admitted to the pediatric inpatient wards. The total number of recorded medication errors was 142 (89.3% of patients) (9). Following the first implementation period, 470 children were admitted, and 57 errors were recorded. Compared with the pre-intervention data, where 89.3% of admitted patients had been subjected to errors, this value had decreased to 12.1%, with an estimated error reduction of 77.2% (9).

Following the second implementation period, a total of 338 children were admitted, and 120 errors were recorded. Compared with the pre-intervention data, errors had been proportionally reduced by 53.8% (9).

Discussion

Our educational program did contribute to a significant reduction in medication errors overall, and the second PDSA cycle suggests that there may still be room for improvement. Understanding the reasons for the discrepancy of results between the two PDSA cycles is the first step towards achieving continuous improvement. There may be several other environmental variables that we have not yet considered (such as the complexity of the individual case, the prescriber's experience, and the timing of the error). Moreover, individual factors about the prescriber/administrator (such as the ability to recall training, perceived work pressures, and stress levels) may have influenced results. These additional elements need to be considered at the next PDSA cycle, as an opportunity to improve professional standards and patient care by addressing learning needs and broader organizational issues.

Conclusion

Our educational program, devised by an innovative inter-professional tripartite alliance, and underpinned by a "zero-tolerance to errors" policy, was successful at reducing medication errors. We believe its implementation on a wide scale would be feasible and cost-effective, and we would hope that similar targeted educational programs may acquire an increasingly relevant role in patient safety and quality improvement (9).

References

1. Cass H. Reducing pediatric medication error through quality improvement networks; where evidence meets pragmatism. *Archives of Disease in Childhood 2016;* 101:414-416.
2. Ghaleb MA, Barber N, Franklin BD, Wong ICK. The incidence and nature of prescribing and medication administration errors in pediatric inpatients. *Archives of Disease in Childhood 2010;* 95:113-118.
3. Walsh KE, Kaushal R, Chessare JB. How to avoid pediatric medication errors: a user's guide to the literature. *Archives of Disease in Childhood 2005;* 90:698-702.
4. Smith J. *Building a safer NHS*. London: Department of Health, 2004.
5. Kaushal R, Bates DW, Landrigan C, McKenna KJ, Clapp MD, Federico F *et al.* Medication errors and adverse drug events in pediatric inpatients. *JAMA* 2001; 285:2114–20.
6. Reeves S, Lewin S, Espin S, Zwarenstein M. *Interprofessional teamwork for health and social care* (Vol 8). Chichester: John Wiley and Sons; 2011.
7. Dornan T, Ashcroft D, Heathfield H, Lewis P, Miles J, Taylor D, Tully M, Wass V. An in-depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education. EQUIP study. *UK General Medical Council*, 2009. Available at: https://www.gmc-uk.org/ -/ media/ documents/ final - report-prevalence - and - causes-of-prescribing-errors_ pdf-28935150.pdf
8. Reece A. DRUG-gle. *MedsIQ,* 2015. Available from: http://www.medsiq.org/tool/drug-gle-druggle
9. Paccagnella D, Issac R, Patel B, Vallabhaneni P. G92 (P) Inter-professional tripartite alliance to reduce medication errors in children. Archives of Disease in Childhood 2020; 105:A30.