

Evaluation of pharmacy TECHnician supported MEDication administration rounds (TECHMED) on reducing omitted doses: a randomised controlled trial and process evaluation in a university teaching hospital

Executive summary, April 2017

Background

Omitted doses are one of the most common types of medication administration error (MAE) in hospitals, and are known to place patients at risk of harm. The aim of this study was to pilot and evaluate the impact of introducing a pharmacy TECHnician supported MEDication administration (TECHMED) service on ward medication rounds on the frequency of omitted doses at a NHS teaching hospital.

Method

This study consisted of two main components; a pilot randomised controlled trial (RCT) of the TECHMED service and a concurrent process evaluation of the intervention involving nursing, pharmacy technician and managerial stakeholders. A total of 10 trained, ward-based pharmacy technicians delivered TECHMED during 3 of the 4 daily medication rounds on weekdays during a four week 'active service' period. Pharmacy technicians delivering TECHMED were expected to directly accompany nurses during the medication round, with duties including sourcing medications, ensuring timely medicines administration and documentation, and liaising with other medical staff when patients refused to take doses. For the pilot RCT, one intervention and control were randomly selected from 3 pairs of matched medical and surgical wards. Pseudo-anonymised electronic prescribing and medication administration data were extracted from the study hospital systems for 4 weeks before ('pre-implementation'), during (4 week 'active phase') and for 4 weeks after ('post-implementation') service delivery for intervention and control wards. Outcomes included total and 'preventable' (unavailable drug, dose omission without a reason, blank boxes) omitted doses. Data analysis proceeded both descriptively and with multilevel logistic regression analysis using STATA v13[®]. Outcomes for the regression models were presented as predictive margin omitted dose event probabilities with 95% confidence intervals (CI). For the process evaluation, semi-structured face-to-face interviews were undertaken with stakeholders during the 'active service' and 'post-implementation' study phases to elicit their experiences of the service and perceptions toward it. Interviews were audio recorded before being transcribed verbatim and organised according to the Framework Approach, with thematic analysis guided by Carol Weiss' Theory Based Evaluation model. This study was approved by the University of Manchester Research Ethics Committee and the participating NHS organisation.

Results

RCT data included 36,599 scheduled medication doses for 1076 inpatients. After adjusting for patient factors (age, gender, elective/emergency admission, days since admission), medication factors (BNF chapter, 'critical list') and time period of administration logistic regression analysis revealed that the predicted probability of any (total) omitted dose or a 'preventable' omitted dose between the ward group receiving TECHMED and the control ward group during the 'active service' study phase was similar (total omitted doses: 19.2% (95% CI) versus 19.0% (16.9-21.2%),

respectively; 'preventable' omitted doses: 3.0% (2.2-3.7%) versus 2.6% (1.9-3.3%), respectively). Process evaluation interviews were conducted with 9 nursing, 10 pharmacy technician and 3 senior managerial stakeholders. On the whole participants welcomed the service and clearly described their role within it. They understood the purposes of TECHMED and were able to provide accounts of how the presence of the pharmacy technician on the medication round led to benefits in staff education and medicines supply in a variety of ways. Whilst many nurses reported the impact of TECHMED on workload in positive terms, the pharmacy technicians were more cautious and commented that in future the balance of TECHMED with existing duties would need to be considered. Crucially, there were some pharmacy technician participants who questioned their impact on reducing omitted doses as part of the service, with others indicating that they did not always directly follow nursing staff on the medication round in accordance with the TECHMED service specification. Reasons included feeling that their presence was not required (lunchtime medication rounds) or that it disrupted nursing activity and increased the risk of medication errors. In contrast, no nurse respondents reported such feelings relating to the presence of the technician on the medication round. Whilst the majority of participants were in favour of extending TECHMED some advocated a more targeted approach directed towards wards with greater omitted dose rates and scheduled dose volumes.

Conclusion

Whilst TECHMED may be feasible to implement in NHS hospitals, wards which received the service were associated with similar predicted rates of omitted doses of medication compared to wards that did not receive it. The concurrent process evaluation was important in highlighting service configuration and fidelity issues as potential reasons for these findings. Further research should determine whether TECHMED should be targeted to achieve maximal impact, as well as to understand the interactions between stakeholders and delivery of TECHMED in practice. This could help inform future developments of the service that should be robustly tested and evaluated.