REASONS AND CONTEXT FOR DISRUPTING NURSES DURING THE ADMINISTRATION OF MEDICINES

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Abstract

Introduction: Administering medication is one of the riskiest operations in healthcare. This research aims to map the reasons and context for disrupting nurses while administering medicines in selected inpatient wards of 4 hospitals in South Bohemia.

Methods: We used the method of directly observing general and practical nurses while administering drugs – in selected internal and surgical wards and long-term care and rehabilitation wards. The data was collected in 2021, 2022, and 2023.

Results: 18,370 inpatient medicine administrations were observed during the morning, midday, and evening administrations. 58 nurses from 4 hospitals, with an average age of 37.4, participated in the research. We recorded 791 interruptions. The most common reasons were patient questions and work communication, but we also recorded interruptions unrelated to nursing care.

Conclusion: Due to the lack of strategies, we recommend introducing preventive measures and educational interventions in the monitored hospitals to reduce disruption while nurses are administering medicinal products, and thus improve the quality and safety of the nursing care provided.

Keywords: *Disruption during medication administration; Drug administration; Hospital; Nursing care; Risk factors*

ORIGINAL ARTICLE

INTRODUCTION

Drug preparation and administration are among the most time-consuming nursing activities (Kim et al., 2023). In the hospital setting, it is common for nurses to be interrupted during medication administration (Bennett et al., 2010; Gao et al., 2021; Johnson et al., 2017; Kliger, 2010; Reed et al., 2018; Sassaki et al., 2019) and these disruptions have been shown to contribute significantly to nurse errors (Anthony et al., 2010; Hewitt, 2010; Mohammed et al., 2022), delays, and task omissions (Schutijser et al., 2019). Distractions reduce task efficiency, leading to longer completion times (Cooper et al., 2016; Schroers, 2018). Based on

250 studies, direct observation of the nurses' medication administration process was identified as the most accurate and reliable way of monitoring drug administration errors (Tesař et al., 2022). The sources and of nurses' distractions during drug administration are different (family members, environment, doctors, patients, colleagues, the nurses themselves) (Wang et al., 2021). The length of the disruption varies depending on different types of hospital wards, etc. (Smeulers et al., 2013). To implement corrective interventions, it is essential to identify the sources of disruption and describe their characteristics (Rafferty and Franklin, 2017). The detection of individual and systemic factors of disruption is also important for increasing the safety of the nursing care provided (Vaismoradi et al., 2020).

This research aims to map the reasons and context of nurses' disruptions during drug administration in selected inpatient wards of 4 hospitals in South Bohemia.

MATERIALS AND METHODS

A prospective observational study was conducted in 4 hospitals in one region of the Czech Republic. Data was collected between 2021–2023. The process of administering drugs to individual patients was monitored during the morning, midday, and evening. Medicines given "as needed" were also monitored (if the need arose during the monitored drug administration). The observation team always consisted of two trained professionals, *i.e.*, a clinical pharmacist and a nurse. The team observed the nurse responsible for the drug administration process, and the medication administration process.

In each hospital, data was collected in the internal, surgical, and follow-up care departments over three consecutive days.

We used direct overt observation for data collection. A test observation occurred the day before, during which the observers became familiar with the department's operation. A secure web database was created for the observational study. At the end of each administration cycle, the paper records were reviewed by the team that carried out the observation on the ward, and the observed condition was recorded in the database. General and practical nurses submitted the individual data, *i.e.*, age, gender, education, total experience in the healthcare sector and the individual departments. Senior nurses anonymously supplied and recorded the data in the web database.

Administration of individually prepared medicinal products and food supplements, administration of infusions, and administration outside of observation were not monitored.

RESULTS

18,370 inpatient drug administrations were observed during the morning, midday, and evening. 58 nurses from 4 hospitals participated in the research. Their average age was 37.4 (20–64).

The context between nurse distractions during drug administration and selected sociodemographic characteristics of nurses

We analysed the correlation between disruptions to nurses during medication administration and the sociodemographic characteristics presented in Table 1. The analysis was based on the number of observations considering the characteristics of their carriers, not the number of respondents.

The results show that there is a correlation between disruptions to nurses during drug administration and the ward type. Nurses were often disturbed in surgical wards, while in contrast, disturbances occurred significantly less in follow-up care wards. Considering the age of the nurses, those between 35–44 and older were most frequently interrupted. Nurses aged 25–34 were less disrupted. Nurses' total experience length also determines disruptions in drug administration. Nurses with the most experience (16 years and more) were disrupted more than nurses with a year or 6–15 years of experience. A nurse's education also affects disruption. Interruptions during drug administration were significantly more often recorded in nurses with a secondary nursing school education (specialising in nurse/general nurse), and to a significantly lesser extent, in nurses with a secondary nursing school education specialising in practical nursing.

Table 1 – The correlation between distractions during drug administration and selected sociodemographic characteristics of nurses

Nurse disruptions during drug administration and …	Value χ^2	df	*p*	Stat. significance
Department type	28.733	2	<0.001	***
Gender	3.096	1	0.082	n.s.
Age	50.571	4	<0.001	***
Total experience	22.523	3	<0.001	***
Experience at the department	15.402	3	<0.01	**
Education	9.603	4	<0.05	*

χ^2 – chi-square; *p* – independence test; df – degree of freedom; n.s. – statistically insignificant difference; * statistically significant difference for significance level α = 0.05; ** statistically significant difference for significance level α = 0.01; *** statistically significant difference for significance level α = 0.001.

Correlation of all reasons for nurse interruption during drug administration and selected sociodemographic characteristics of nurses

We recorded 791 interruptions during 18,370 drug administrations. The reasons for interrupting nurses were most often questions from patients (*n* = 312; 39.4%), work communication (*n* = 237; 30.0%), conversations not related to nursing care (*n* = 91; 11.5%), drug or material replenishment (*n* = 39; 4.9%), other reasons (*n* = 36; 4.6%), urgent patient situations (*n* = 31; 3.9%), telephoning (*n* = 23; 2.9%), helping the nursing team (*n* = 18; 2.3%), alarms (*n* = 4; 0.5%).

Table 2 shows the statistical analysis results of the correlation between the reasons for the nurses' interruption during drug administration and their sociodemographic characteristics. The internal ward nurses were more often interrupted by conversations unrelated to nursing care. In the follow-up care departments, the main reasons were phone calls and/or patient questions. Nurses under the age of 24 were interrupted most often. Nurses between 45–54 often had conversations not related to care. Nurses aged 55 and older were disrupted by work communication. Nurses with the longest working experience (16 or more years) were usually disrupted by a conversation unrelated to patient care. Nurses with one year of experience were often disrupted by questions from patients. Nurses with 2 to 5 years of experience were often disrupted by situations in which they had to help the nursing team. Another identified correlation was between disruption during drug administration and the nurses's education. Practical nurses with a high school education were usually interrupted by questions from patients. Work communication occurred most frequently among general nurses with secondary education.

Table 2 – Context of all reasons for the disruption of a nurse during drug administration

Reasons for disruption during drug administration and …	Value χ^2	df	*p*	Stat. significance
Department type	80.069	16	<0.001	***
Gender	4.367	8	0.823	n.s.
Age	112.647	32	<0.001	***
Total experience	78.041	24	<0.001	***
Experience at the department	76.333	24	<0.001	***
Education	103.173	32	<0.001	***

χ^2 – chi-square; *p* – independence test; df – degree of freedom; n.s. – statistically insignificant difference; * statistically significant difference for significance level α = 0.05; ** statistically significant difference for significance level α = 0.01; *** statistically significant difference for significance level α = 0.001.

DISCUSSION

This study aims to map the reasons and contexts of nurses' disruptions during drug administration in selected inpatient wards of four hospitals in South Bohemia. The study results show that nurses are most often distracted in surgical departments. The main reasons for interruptions are patient questions during drug administration, work communication, and communication unrelated to nursing care. Reed et al. (2018) found that approximately 39% of the monitored actions were aborted. Nurses interrupted drug administration to attend to the reason for the interruption (51.1%) or tasks (40.3%). They preferred that to responding to the interruption until they had finished administering the medication (12.6%). Teigné et al. (2023) also focused on mapping the characteristics of professionals' work interruptions in the inpatient hospital sector. They found that, on average, professionals recorded 10.5 interruptions per hour, 57.4% of which could have been avoided. Schutijser et al. (2019) found that most interruptions were externally initiated by other nurses (19%) or patients (19%). However, some nurses were wearing do-not-disturb vests to alert others not to disturb them during drug administrations.

Since disruptions can never be completely avoided, nurses can be prepared for such situations, learn how to manage them (Reed et al., 2018), and reduce self-initiated disruptions (Smeulers et al., 2013). The Norwegian study by Alteren et al. (2021) describes nurses' experiences with working in an environment where they were frequently disrupted – and the strategies they adopted to effectively reduce such disruptions and improve drug administration safety in hospitals. They identified three strategies that increased drug administration safety. The first is not to disrupt nurses with other activities during drug preparation and administration. The second is that nurses are guided by individual stress management when organising work activities while administering medication. The last strategy is related to the management and adherence to binding drug administration standards.

Emphasis should be placed on patient safety in educating nurses and safe drug administration (Hayes et al., 2015). Yan et al. (2022) evaluated the effect of an interactive learning programme concerning safety behaviour and practical ability about disruption in young nurses (less than 10 years of service or younger than 30 years) and its influencing factors. 600 young nurses were included in the study. An interactive step-by-step tutorial effectively improved young nurses' safety and disruption management behaviour.

Simulation using virtual reality with examples from clinical practice can also be a way to educate nurses on safe drug administration procedure (Rossler et al., 2021). That way, future nurses could safely practice communication patterns for professional resolution of the disruption source (Wagner et al., 2020). The monitored hospitals have not developed any strategies for reducing nurses' disruptions during drug administrations. Although nurses manage distractions and multitasking well, there remains potential for error, thus strategies to reduce distractions are necessary. A combination of continuous nurse education, work environment modifications, such as creating quiet zones, patient education, and the introduction of new technologies (*e.g.*, automated unit dosing systems for individually packaged and labelled drugs for hospitalized patients) appear to be suitable for minimising disruptions. An example of different use of new technologies is the American hospital Cedars-Sinai Medical Center. They implemented an innovative project using voice-controlled intelligent personal assistants, aiming to reduce interruptions of their employees while providing care (Hain et al., 2023).

CONCLUSION

Drug administration is one of the most important and time-consuming nursing tasks in healthcare facilities. The safety of the preparation process and drug administration should be constantly increased. It is necessary to identify factors that can lead to errors and take the necessary measures to minimise or eliminate them.

Although nurses manage distractions and multitasking well, there is potential for errors. Strategies to reduce distractions are necessary. A combination of continuous nurse education, work environment modifications, such as creating quiet zones, patient education, and

the introduction of new technologies appear to be suitable for minimising disruptions.

Ethical aspects and conflict of interest
The authors have no conflict of interest to declare.

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