CHAPTER 14

Facilitators and Barriers to Safe Medication Administration in Nursing Homes

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Abstract: Medication administration in nursing homes is a complex and dynamic process, in which the characteristics of the socio-technological work system interact and adapt according to shifting circumstances. Therefore, safe medication administration entails a broad set of tasks and interactions conducted by healthcare professionals, and the process is influenced by a complex web of facilitators and barriers. In our study of two Norwegian nursing home wards, we identified a total of 60 facilitators and barriers to safe medication administration. Several facilitators and barriers were intertwined, meaning that they could act as both facilitators and barriers depending on situational factors in the nursing home's work system.

Keywords: Nursing home, patient safety, medication administration, facilitators and barriers

The majority of the approximately 40,000 nursing home patients in Norway are long-term residents aged 80 or older. They are cared for by approximately 140,000 full-time registered nurses, nursing assistants and other healthcare personnel (Ministry of Health and Care Services, 2015; Statistics Norway, 2019). Although there are few systematic efforts to map

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and describe adverse medication events in Norwegian nursing homes, the assumption is that a significant number of adverse events related to medication administration occur here.

Therefore, the objective of this chapter is to describe the facilitators and barriers to safe medication administration in nursing homes using a human factors approach.

Traditionally barriers are viewed as factors that may hinder or impede actions that may result in adverse events. This chapter considers barriers as factors that may hinder safe care, and cause adverse medication administration events. Facilitators are regarded as factors that facilitate or improve the medication administration process.

The chapter is based on the results from a PhD thesis entitled, "A Human Factors Approach to Medication Administration in Nursing Homes" (Odberg, 2020), in which a re-analysis using narrative synthesis has been conducted, offering new insights into the medication administration process in nursing homes.

Medication Administration Events

Older patients are vulnerable to adverse drug events due to individual factors, such as frailty, disability, comorbidity, drug interactions and a high prevalence of polypharmacy. Also, high potency drugs such as opioids, antipsychotics, antidepressants, antiepileptics and anti-infectives increase the risk of cognitive impairment and falls (Al-Jumaili & Doucette, 2017; Field et al., 2001; Herr et al., 2017; Violan et al., 2014).

Patient safety literature describes the following system-level factors affecting the risk of adverse drug events (Al-Jumaili & Doucette, 2017):

- staff competence
- indistinct procedures
- inadequate staffing
- high workload
- time pressure
- interruptions
- ineffective interprofessional collaboration

These factors are supported by findings from audits by the Norwegian Board of Health Supervision (2010). They found deviations from standards in medication management in 51 out of 67 (76%) of the nursing homes audited. The deviations included: unclear lines of responsibility; time pressure; lack of competence; poor interprofessional collaboration; variations in observing and documenting the effects of medications; poor availability of vital patient information due to multiple documentation systems; and separate documentation systems for the medical doctor.

International literature indicates that 13%-31% of all nursing home patients experience some form of medication administration error. Simultaneously, the incidence of severe adverse drug events is low (Al-Jumaili & Doucette, 2017; Ferrah et al., 2017). In Norway, there is no available information on medication administration events in nursing homes or in primary healthcare in general.

The Medication Administration Process

The medication administration process is well documented to be complex and dynamic across healthcare domains, and this also holds true in the nursing home context (Carayon, et al., 2014). Traditionally, nurses are taught to practice the six "rights" of medication administration: 1) right patient; 2) right medication; 3) right dosage; 4) right route; 5) right time; and 6) right documentation (Yoost et al., 2015). The nurse plays a central role throughout the medication administration process (Jennings et al., 2011; Odberg et al., 2019). Specific tasks related to medication administration are often difficult to separate from work processes of daily care. To structure and describe the medication administration process, it may be deconstructed into six consecutive stages:

1) **Ordering** is when the physician decides what medicines to prescribe, with details such as dosages and timing. This is often done in collaboration with the registered nurse.
2) **Transcribing** is the formalizing of the orders into forms or an electronic medication administration system.

3) **Dispensing** is when the registered nurse checks the medication list against the electronic medication administration system and dispenses the medicines into pill boxes.
4) **Preparing** is when the registered nurse readies the medication for ingestion and performs a double-check before administration.
5) **Administering** is the actual delivery of medications to patients.
6) **Observing** entails monitoring the patients for effects after they take the medicines, and the subsequent documentation.

The following flowchart (Figure 1), is based on observations of the medication administration process in two Norwegian nursing homes, visualizing the dynamic flow and intrinsic complexity of delivering medications to nursing home patients (Odberg et al., 2017). The stages of the medication administration process are vertically listed on the left side in Figure 1, while on the right side are corresponding elements detailing tasks and interactions.

Human Factors and Patient Safety

To gain further knowledge of the complexity of the medication administration process in nursing homes, including the facilitators and barriers to safe medication administration, a socio-technical systems approach is useful. *Human factors* embodies a systems approach concerned with designing safe and effective systems with human beings at the core (Dul et al., 2012). Carayon et al. (2006) describe a human factors system engineering model promoting patient safety, the System Engineering Initiative for Patient Safety (SEIPS model). The basis of the model lies in the interacting elements of the work system, as shown in Figure 2. The five elements of the work system: persons, physical environment, tasks, tools and technology, and organization, do not exist as isolated cells. Still, they interact in often subtle ways and must, therefore, be seen as a whole. These elements interact when humans engage in healthcare processes, such as medication administration in nursing homes, to produce specific outcomes. Outcomes may be positive or negative consequences of different processes in the work system. An example of a negative outcome is

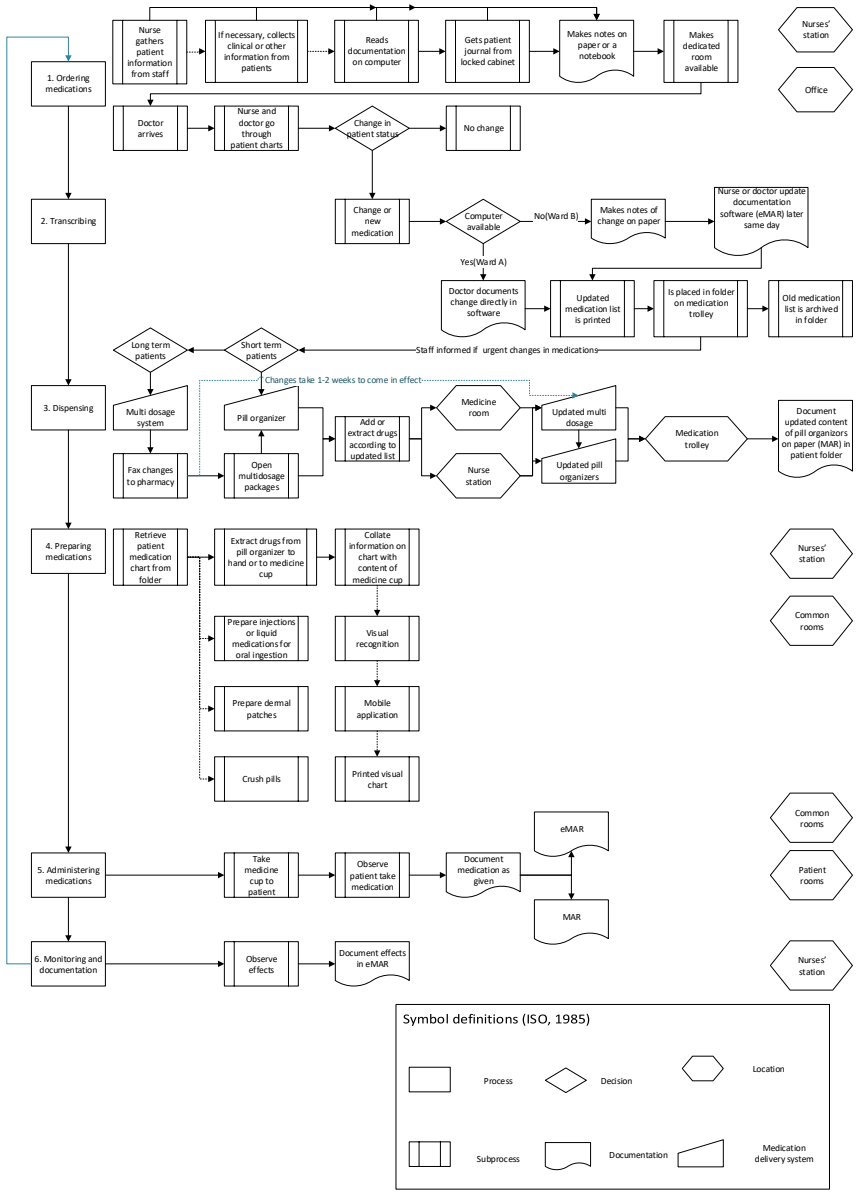

Figure 1. Flowchart of the Medication Administration Process in Nursing Homes (Odberg et al,. 2017)

an adverse drug event, while a positive outcome can be safe and effective medication administration.

The five elements of the work system can be described as follows (Carayon et al., 2006; Dul et al., 2012; Holden et al., 2013):

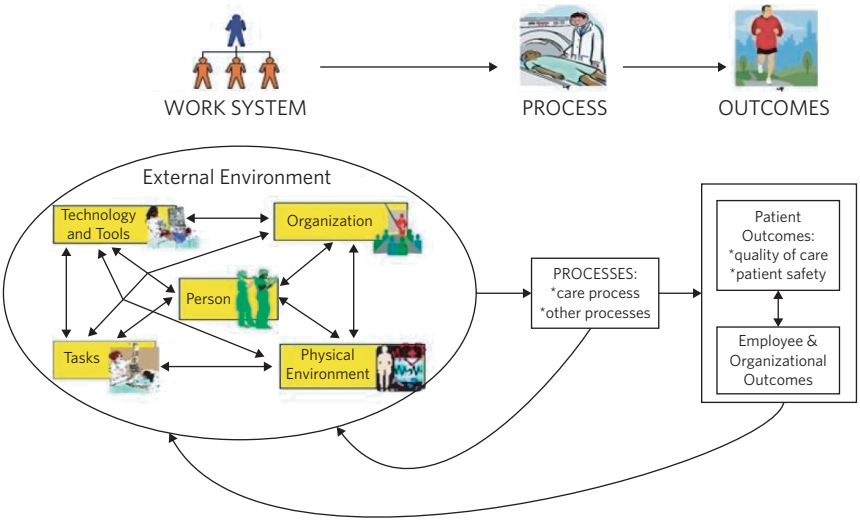

Figure 2. The SEIPS Model (Carayon et al., 2006)

Persons are at the center of the work system and represent the stakeholders involved in a given process: patients, next of kin, registered nurses, physicians or other healthcare professionals. These individuals exhibit cognitive, physical, and psychosocial characteristics, such as age, experience, competence, knowledge, training or education.

The physical environment represents the characteristics of the facilities in which healthcare workers provide care, including: noise, temperature, lighting layout, distances and air quality.

Tasks are the specific activities within different work processes, such as medication administration, and are characterized by attributes describing difficulty, complexity and variety.

Tools and technology specify how healthcare workers utilize equipment and medical devices, such as medical electronic administration records, blood glucose meters or tools to mobilize patients. Typical features relate to the usability, familiarity, functionality and portability of various equipment.

Organization indicates the collective structures that guide and organize activities, resources, time and space. Typical examples are work schedules, management type, policies or patient safety culture.

Human factors provides insights into healthcare processes by offering distinct, descriptive opportunities to simplify and visualize complex systems and processes. Using the work system of the SEIPS model as descriptive categories facilitates structuring the medication administration process.

Methodology

The PhD thesis on which this chapter is based used a QUAL-qual mixed methods study design (Morse, 2016). The main component (QUAL) was 140 hours of observations, while the supplemental component (qual) consisted of 16 individual interviews (Odberg, 2020).

By conducting a re-analysis of data using a narrative synthesis (Thomas & Harden, 2008), this chapter offers new insights into the medication administration process by further reflecting on the work system complexity of nursing homes, and how this influences the safety of medication administration. New data is presented in the form of quotations throughout the results section below.

Two different nursing home wards in different municipalities were recruited to capture some of the variability in Norwegian nursing homes. They were one urban palliative care nursing home ward (A), and one rural nursing home ward (B) catering to persons with dementia. The inclusion criteria for participating in the interviews were that staff members had a role in the medication administration process and were employed in at least a 50% position. In all, sixteen participants agreed to be interviewed, including special care nurses, registered nurses, nurse managers, medical doctors, physical therapists, and nursing assistants.

Data was collected through 140 hours, distributed between participant field observations spread evenly across wards A and B (QUAL), and semi-structured individual interviews (n = 16) (qual) with healthcare professionals dispersed across wards A and B. An interview guide and an observation guide based on the work system of the SEIPS model were used. Inductive and deductive qualitative content analyses inspired by Elo and Kyngäs (2008) were performed.

Ethics

All participants were informed about confidentiality and of the right to withdraw at any time. The study adhered to ethical guidelines and was approved by NSD (NO: XX).

Results

The study confirmed the picture of medication administration in nursing homes as a complex and dynamic process, in which the characteristics of the socio-technological work system interact and adapt according to shifting circumstances. The medication administration process according to the six stages (Figure 1) was found to contain 60 facilitators and barriers to safe medication practice. Throughout the process, the nurse plays a central role, compensating for variations in the work system, while demonstrating great flexibility in meeting the demands of the patients.

A nurse described how the workplace had transformed with increasing complexity during the past few years:

> Our patients have more complex illnesses than was the case earlier. A few years ago, this was a place for persons with dementia, and they were quite healthy. However, now we receive patients with more diverse and complex illnesses. Everything from heart and lung diseases, atrial fibrillation and all the medications that follow. It has become a lot more taxing to follow up, medically speaking.

While another nurse reflects on the increased workload associated with medication administration:

> The complexity of medication administration varies a lot. We have oral, subcutaneous, and transcutaneous patches. Some patients have tablets, mixtures, patches, and a pump as well … Then it becomes an issue, and you have to sit down and take stock.

Figure 3 is an adapted SEIPS model documenting how the 60 facilitators and barriers to safe medication administration have been condensed into 17 groups, and systematized across the five work-system elements. A +

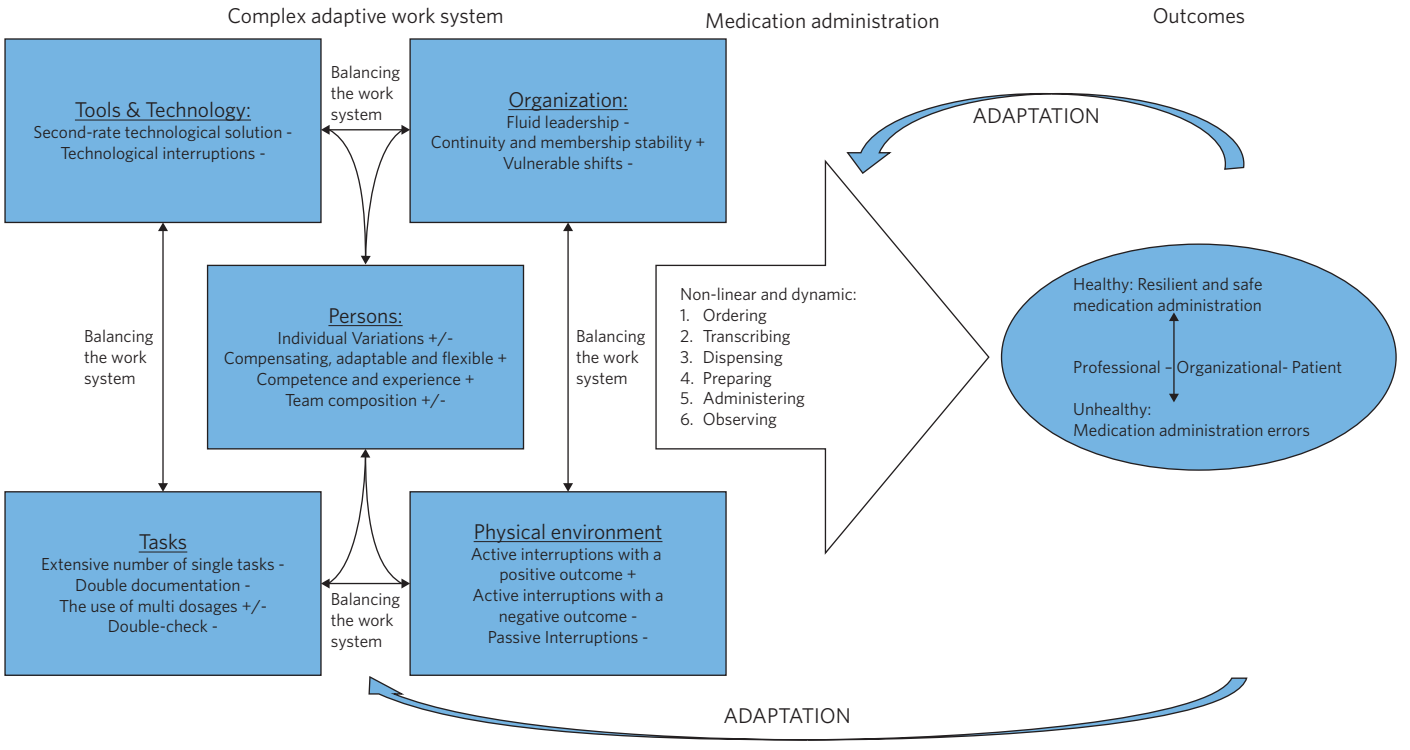

Figure 3. An Adapted SEIPS Model With Key Facilitators and Barriers to Safe Medication Administration

indicates a facilitator, while a – indicates a barrier. Some groups exhibit both, +/-, and thus indicate dual traits that may perform as both facilitators and barriers, depending on the circumstances. Dual traits are a novel element and tied to how individual staff members embody different knowledge and competence, which in turn will influence how they perform their tasks in different situations. For example, the electronic Medication Administration Record (eMAR) is in itself complex, multilayered software, and effective workflow depends on IT skills and knowing specific codes and shortcuts by heart.

Persons

This work-system element focuses on the nurse's role, and how individual variations and differences in competence and experience can function as facilitators or barriers in how staff use their flexibility to modulate team composition, navigate everyday care, and perform medication administration.

In the context of the two nursing homes, different stakeholders were involved at different times of the medication administration process. The main ones included the patients and their informal carers, and professional stakeholders such as registered nurses (RN), nursing assistants, physicians and physiotherapists. The RN's unique role, being involved in all the stages of the medication administration process, was reflected in how RNs took on responsibilities beyond their given assignments to ensure patient care. The RNs expended massive resources navigating everyday tasks in order to perform medication administration of a very high standard. Time pressure, singular responsibility, high activity, and demands for documentation required strict prioritizing. In many instances, the nurse felt constrained by administrative tasks and delegated direct patient care to colleagues. These decisions also impacted the team composition during a shift. A nursing assistant described this collaboration:

> We use each other's strengths and qualities and trust each other, assign tasks and cooperate. Sometimes I have shortcomings, and a nurse is needed; other

> times I can assist them (the nurses) when things are bustling. We cannot relieve the nurses for everything, but I do what I can for them, and that seems to work.

A vital facilitator was identified by three specific characteristics of the RNs: compensatory, flexible and adaptable.

The RNs compensated for the different individual skill sets and competencies of the surrounding staff on a given shift. This dynamic and continuous evaluation led to shifting responsibilities, where the RNs often took on tasks beyond their work description to fulfill all medication-related tasks.

On a given shift, the RN had to be flexible regarding structuring the workday and delegating medication-related tasks. As team members differed from day to day, a particular regard for individual skill-sets and competencies always informed the RN's role. Sometimes lack of skill redundancy on a shift led to vulnerabilities as the single RN prioritized administrative tasks.

The RN constantly adapted to changing workloads and a shifting environment, working with different staff members. Staff stability and good leadership were therefore underscored as essential to minimize stress and ensure good collaboration.

These characteristics were crucial to enable safe medication administration, and showed how tenacious and vulnerable this balancing act of the RN was.

Organization

Three distinct features of the facilitators and barriers stood out under the work-system element of organization (Figure 3): leadership was fluid; membership stability was important; and vulnerable shifts could be critical.

Scattered and fluid leadership was a barrier affecting the day-to-day handling of medications. This was reflected clearly on a team level, where the role of team leader was interchangeable, depending on shifting conditions in the ward. If circumstances arose where the team leader

had to shift priorities, another team leader was appointed ad hoc with a minimal transfer of information. Consequently, the responsibilities of the different team members often appeared unclear, and, in addition, guidelines and procedures to supplement decision-making when needed were inadequate. A nurse manager described how task delegation ideally took place:

> As a leader, I get an overview and assign patients and tasks, and help them structure their workday. The staff is organized into groups with primary care nursing, and I assign them their tasks to the best of my ability. Even though they get assigned to a group of patients, they should be flexible and help each other.

Another example of fluid leadership arose during pre-visitations when an RN as team leader prepared for the ward round with the resident physician. The RNs may have more familiarity with the patients, and sometimes they were more experienced than the physician. Consequently, in some cases, the RNs took on tasks and responsibilities beyond their training and expectations, as they saw it necessary to safeguard the medication administration process.

Membership stability was found to facilitate safe medication management during periods of high activity in the wards. Several staff members reported that working together during extreme conditions led to more effective communication and better task distribution. One may assume that heavy workloads over more extended periods might lead to resignations and higher turnover, but it was also found to be an incentive that induced the staff to find creative solutions and creative workarounds. Membership stability within work groups thus seemed to counter adverse conditions and have a stabilizing effect:

> When you work with someone you do not know or assistants you do not fully trust, you spend much energy caring about their tasks as well. You feel the responsibility of having an overview, since you are unsure whether all tasks will get done the way you would like them to. (Interview with an RN)

Meanwhile, periods of high activity also led to vulnerabilities, as there were few extra resources to handle unforeseen situations. Extreme

situations led to the staff needing to prioritize medications for those patients most in need, while stable and self-sufficient patients received less attention. Sometimes this resulted in missing or delayed medications, and less time to observe, document, and perform generic administrative tasks. Vulnerable shifts as barriers were typically night shifts, weekends, and major vacations that coincided with heavy workloads and unforeseen activities, increasing the perceived risk of medication administration errors. Shortcuts, workarounds, and an acceptance of these inferior working conditions became accepted and normalized by the staff, while they also described such shifts as highly challenging and debilitating. To counter vulnerable shifts, the staff always tried to plan ahead:

> I think they (the nurses) are good at preparing for the night shifts in a way that ensures that all the patients will receive the best possible care. Somehow they get ready if they identify increasing unrest or something else in the ward. If patients are ill, they prepare for the night. They may contact the doctor and arrange a prescription for morphine, and even prepare the medicine itself in advance. (Interview with a nursing assistant)

Over time an acceptance of inferior working conditions and behavior that may deviate from standards and norms seemed to grow.

Tools and Technology

Two key barriers are presented in Figure 3: inferior technological solutions and technological interruptions.

Nursing homes use many different tools and technologies to perform daily activities. Many medication-related tasks are tied directly to documentation and the use of electronic medication administration records (eMAR). Other municipalities may apply different types of software to fulfill the same role, replacing paper records of journal entries, patient records, medical records, and nursing reports. This, however, poses challenges for the staff due to poor design choices, lengthy login procedures, separate closed modules within the same software, and challenges when communicating with external networks and devices.

Together, it leads to an inferior technological solution for supporting administrative tasks in general, and documenting medication administration in particular.

> The eMAR is not very user friendly. It is all about how it is put together, searching for specifics is nearly impossible … you just have to read and read until you find it … some information just seems to disappear and you have to retrieve it manually. (Interview with an RN)

An example of this is how on-demand medication documentation exists within separate modules in the eMAR, which do not connect to the primary medical records. In turn, this leads to double documentation and creative workarounds, and in some instances also delays or omissions of documentation.

Another key barrier in this work-system element is technological interruptions. They are typically caused by inferior technology, such as a lack of Wi-Fi or bugs and glitches in the documentation software forcing the user to alter, delay or omit tasks. An example of a technological interruption was during pre-visitation, when the physician depended on an application on a mobile device to access the Norwegian Medicines Manual for Health Personnel. However, this meeting took place in the basement and lacked Wi-Fi or cellular signals. This led to significant delays and disrupted the medication review.

Physical Environment

In the physical environment, active and passive interruptions were prominent, as shown in Figure 3.

The physical environment of the nursing home plays a distinct role in how and where the staff perform medication-related tasks. The medicine rooms were far from the nursing station and adjoining patient rooms in both of the observed nursing homes. To compensate, the staff used mobile medication trolleys extensively, which often led to medication administration occurring in busy environments characterized by interruptions and a cluttered workspace.

> I believe the nursing station is unfit, there is so much noise. There are always people coming and going … It makes it hard to concentrate and be focused on our task … Also the computers are there and you never get the peace and quiet you should … so it is not the best. (Interview with an RN)

Two additional types of interruptions were identified that affected the medication administration process. Firstly, there were passive interruptions, such as background noise and activities that may lower cognitive functions and proceed to become active interruptions.

Secondly, active interruptions occur when a primary work task is disrupted due to nearby activities, conversations, incoming calls or spontaneous engaging in conversations. Breaks in a primary task often led to extended breaks before resuming, or that the staff member took on a secondary task even though the primary task did not always resume. Active interruptions often took place in busy environments, such as the nursing station or common rooms. Most active interruptions had negative outcomes, but sometimes they could also lead to positive ones. Examples of positive outcomes were informal conversations about patient issues that led to discoveries or revelations resulting in changes in medications or treatment plans.

Tasks

In this work-system element, the extensive number of tasks, double documentation, double-check, and multi-dosage medications were vital facilitators and barriers.

Within the medication administration process, we identified 29 distinct tasks throughout the six stages from ordering to observing and documentation (Figure 1). These tasks were perceived differently among the professional stakeholders, sometimes with a feeling of being overwhelmed by all the daily activities:

> And then we have so many different tasks. You are supposed to take part in the social patient-related activities in the ward. You have medication administration, mapping of patients, follow-up of the annual controls, medication reviews, blood sampling and such. Then comes the doctor's visitation, for which you are responsible. Moreover, there are many practicalities to handle. (Interview with an RN)

The RN often regarded medication-related tasks as complex and challenging, while nursing assistants tended to view the process as more linear and rule-bound. The mapping of the medication administration process within the work system of the nursing homes revealed that most barriers occurred during the first two stages: ordering and transcribing. These barriers are often related to unclear communication and inferior documentation systems. Therefore, ordering and transcribing seem to be especially vulnerable to medication administration errors, potentially cascading, thus causing sequential errors and adverse events at a later stage.

Double-check is often marked as a critical step in delivering medications to the patients, but practical challenges often interfere. A lack of qualified health care personnel or busy schedules sometimes do not permit double-control, and creative workarounds often replace this safety measure. An example arose when an RN prepared intravenous morphine for a patient, but there was no qualified personnel nearby to perform the obligatory double-check. The RN documented the process by taking pictures with a private cellular device and sending them to an off-duty colleague for confirmation. Night shifts present a particular challenge:

> To be honest, double-checking medications on a night shift … That just does not work. (Interview with an RN)

Double documentation was detectable, since the RNs kept separate notes in a "black book" to keep track of daily activities and medication-related tasks. This was partly due to challenges maintaining an effective workflow in the eMAR. To ease the transition between modules in the eMAR, medical charts were sometimes printed and put in a patient folder and stored physically.

Many patients use multi-dose medications. These are prescribed two weeks at a time and then dispensed and delivered to the wards from the pharmacy. The RN would then manually alter all previous multi-dose medicines and physically transfer them to new dispensers. This often proved challenging, as visitations took place once or twice a week and often led to prescription changes. In addition to being time-consuming, it was also a perceived safety risk.

Human Factors and Steps to Minimize Adverse Drug Events

As medication administration is ingrained in the daily activities of healthcare professionals' work in nursing homes, identifying single measures to improve medication management or reduce medication administration events is challenging. Using human factors to categorize facilitators and barriers across the various work-system elements may aid such efforts. Since prior interventions, such as guidelines or checklists, aiming to safeguard medication administration in nursing homes only partly address all the challenges, systematically mapping facilitators and barriers may inform future improvement efforts (Keers et al., 2013; Odberg et al., 2020). This study shows how facilitators and barriers across the five elements of the work system may impact the medication administration process. Yet, it is essential to keep in mind that they interact dynamically. This means that changes in one work-system element may have consequences in one or several interconnected elements. For example, the physical distance between the medicine room and the ward (physical) affects social interactions (persons) and how the staff manages medications (task), making the medication administration process more susceptible to interruptions. At the same time, social congregation around the medication trolley may also serve as a safety net, where potential medication events are intercepted before reaching the patient. Therefore, being surrounded by colleagues is often perceived as an added safety measure by the staff, and may reflect a need for vigilant communication and coordination to promote safe practices (Odberg et al., 2017; Raban & Westbrook, 2014). In consequence, moving the medicine room closer to the ward or altering the medication trolley routines may have unforeseen consequences.

Working together in limited physical spaces also increases the risk of being interrupted. At the same time, the literature describes several interventions to minimize interruptions, but the evidence is scarce that such interventions reduce medication events, since the complexity of the work system often entails unforeseen consequences. Examples of interventions to reduce interruptions are: dedicated medication rooms; the use

of yellow vests or tabards; no-interrupt zones; safety checklists; and various technological solutions (Lapkin et al., 2016; Westbrook et al., 2017). Since humans are at the center of the work system, interventions that improve the cognitive skills needed to cope with interruptions may have a more effective impact. Nursing students training to handle interruptions in a simulated environment report heightened awareness and positive learning experiences in relation to how they perceive the medication administration process. The nursing students also learned techniques for managing interruptions by using enhanced clinical reasoning and judgement (Hayes et al. 2015). Training nursing home staff on how to handle interruptions may therefore be a useful measure.

Double-checking as a procedure involving independent, simultaneous medication checking by two competent persons was a critical factor identified in the two nursing homes in our study. Several barriers across the work-system elements seem to play a role in how the staff manages the practice of double-checking. Vulnerable shifts (organization), varying competence (persons), unclear guidelines (organization), team composition (persons), under par technological solutions (technology), and task complexity (tasks) all contribute to the challenging nature of mandatory double-checks. The study showed that problems most often arose when there was only one RN on a shift. This often resulted in workarounds and delays, or altogether skipping the double-check. Nevertheless, adverse medication events still appear to occur during double-checking, and RNs have mixed perceptions of the procedure. It is a way of feeling safe for some, while others perceive it as redundant (Alsulami et al., 2012). At the same time, there is little evidence for the effectiveness of double-checking in reducing medication errors (Lapkin et al., 2016). More research is needed to explore the efficacy of double-checking in nursing homes.

Double documentation often introduces the risk of adverse events. This study showed how the first two stages of the medication administration process (ordering and transcribing) were especially vulnerable to many associated barriers across several work-system elements. Most visible was how a lack of computers with eMAR functionality, or separate modules within the eMAR, led to analogue solutions and double documentation.

Such practices may lead to subsequent problems retrieving vital information quickly or losing information, leading to sequential issues (Carayon et al., 2014). An example from the observations showed how the staff had documented the weight of a patient in a separate folder that had gone missing. The patients' weight was essential to dose a specific drug, resulting in dosing and prescribing having to be postponed to the next week. Electronic medication administration record systems may reduce the perceived risk of committing medication errors (Alenius & Graf, 2016), but it seems that only well-integrated electronic barcoding effectively reduces medication events. Electronic barcoding entails measures to check correct medicines, dosages and patient identity (Shah et al., 2016).

Nursing Homes as Complex Adaptive Work Systems

Most of the identified facilitators and barriers in the two nursing homes indicate how the staff change behavior and reasoning to overcome challenges and perform safe medication administration. From a human factors perspective, the wards' functionality reflects how different adjustments across each of the work-system elements interact during medication administration to balance the work system as a whole.

Nursing homes can, therefore, be labelled as complex adaptive work systems. They may be described as nonlinear, in which diverse agents capable of spontaneous self-organization interact. These dynamic work systems evolve and adapt to meet foreseen and unforeseen events (Matlow et al., 2006; Rouse, 2008). Individuals make adaptations according to psychological, physical, and social rules, and they adapt to each other. In addition, persons learn from past events. This may result in self-organization, through which patterns of behavior emerge. Such patterns may have healthy or unhealthy consequences for an organization (Rouse, 2008). Examples are when individuals adopt workarounds or shortcuts, such as omitting double-checks or utilizing double documentation. Over time, these practices may spread to the remaining staff and become normalized. The normalization of deviance may be necessary to maintain effective care, but may also create vulnerabilities in the work system enabling

adverse events. In most cases though, normalization of deviance centers on adapting to a changing work system, and minimizing the gap between work as imagined and work as done (Hollnagel, 2012; May & Finch, 2009). This is reflected in how staff members utilize their competence, experience and cognitive faculties to provide safe medication management.

Conclusion

The study of two Norwegian nursing home wards identified a total of 60 facilitators and barriers to safe medication administration. Several facilitators and barriers were intertwined, meaning that they could act as both facilitators and barriers depending on situational factors in the nursing home's work system. Taking the complexity of the medication administration work system into account, it seems prudent that future interventions that address medication safety in nursing homes should be multifaceted, involving all personnel, including leaders. The SEIPS model may facilitate a systems approach that can assist staff and management in nursing homes in identifying relevant critical issues in this area. More specifically, the work-system elements can serve as a practical guide to inform any improvement measures.

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