

Introduction: Medication Safety in Municipal Health and Care Services

Rose Mari Olsen^{1,2} & *Hege Sletvold*³ (editors)

¹Faculty of Nursing and Health Sciences, Nord University, Namsos, Norway

²Centre for Care Research Mid-Norway, Nord University, Namsos, Norway

³Faculty of Nursing and Health Sciences, Nord University, Stjørdal, Norway

Background

Medicines constitute an essential part of healthcare delivery, and help to prevent or treat illness, influence quality of life, and generally increase life expectancy. However, medications can cause harm if prescribed irrationally, dispensed or used incorrectly, and monitored or followed up insufficiently (Ofori-Asenso & Agyeman, 2016). Furthermore, medication harm can be a result of errors, accidents, or communication problems (World Health Organization (WHO), 2017). Unsafe medication management and practices have consequences on both the patient and healthcare system level in the form of injuries, failure of therapy, worsening of illness, increased use of healthcare services, and large financial expenditures (Donaldson et al., 2017; Elliot et al., 2020; Panagioti et al., 2019).

We understand medication safety as freedom from avoidable harm while using medicines, or those actions that avoid, prevent, or correct harm caused by medicines. Since 2017, WHO has focused on medication safety in the global patient safety challenge, “Medication Without Harm”, where the goal is to reduce severe, avoidable medication-related harm (Donaldson et al., 2017). Furthermore, medication safety is central in WHO’s Global Patient Safety Action Plan 2021–2030, where the goal is to achieve the maximum possible reduction in avoidable harm due to unsafe healthcare (WHO, 2021).

Rational use of medicines and safe medication management have been important focus areas in patient safety initiatives both in Norway (The Norwegian Directorate of Health, 2020) and internationally (Bates & Singh, 2018). Generally, the past 20 years have witnessed a positive development in solutions for patient safety measures, however there remains some incompletion in clinical practice implementation (Bates & Singh, 2018). Most of the documentation relating to preventable patient harm and medication errors in healthcare originates from studies conducted in general hospitals or in advanced speciality care (Panagioti et al., 2019; WHO, 2016). However, the risks present in primary care may differ from the hospital setting, since there are differences in the type of clinical problems, medicine use, and the organization and systems of medication practices (Bates & Singh, 2018; WHO, 2016). Therefore, there is still a need to seek more knowledge, and focus on the prevention of medication harm in primary care settings, that is, municipal health and care services, which encompass a high patient volume.

The Scope of the Anthology

In this anthology, we want to showcase the challenges of medication management and the rational use of medicines in municipal health and care services, and present various strategies and measures related to medication safety. The anthology hopes to raise awareness, engage, and enable discussion of initiatives and strategies to improve patient safety related to medications in municipal health and care services. Furthermore, this is a scientific anthology, which can create a basis for

further research to promote safe medication management and rational use of medicines.

The anthology will be of interest primarily to healthcare professionals, academic staff, researchers, policymakers, and managers in healthcare services. Furthermore, anyone involved in, or concerned with, medication safety will hopefully benefit from reading the anthology.

Structure, Chapters, and the Contributors

The anthology is structured according to the four domains of WHO's strategic framework of the third global patient safety challenge, "Medication Without Harm", wherein medications are described as able to cause inadvertent harm: 1) patients and the public, 2) medicines, 3) healthcare professionals, and 4) systems and practices of medication (Donaldson et al., 2017).

This anthology includes 17 chapters compiled through contributions from 35 researchers who represent a wide range of disciplines, and who have experience from different levels of healthcare services, and from different parts of the research and education sectors. Thereby, the anthology provides valuable insights based on expertise in the field of medication safety. The material investigates different aspects of medication safety in municipal health and care services, and highlights a wide range of ongoing initiatives and practices.

Part One: Patients and the Public

Part one consists of three chapters, all relating to patients' opportunities to play their part in ensuring safe medication use. A recognized challenge to medication safety is that users of healthcare services are often forced to be passive recipients of medicines, without being empowered to participate in making their own medication use safer (Donaldson et al., 2017; WHO, 2021). In chapter two, Olsen and Sletvold present a systematic review of randomized controlled trials (RCT) testing the effectiveness of patient engagement interventions to enhance medication safety in long-term care. Five RCTs were identified, representing extensive

heterogeneity in intervention designs, populations, settings, and outcome measures. Although three RCTs report statistically significant effects of patient engagement interventions on medication safety, the limited body of evidence suggests that future research is needed to guide the practice field and stakeholders.

Medication treatment in cancer care has a potentially high risk of adverse events. In chapter three, Haukland and Bergerød provide new information on how to involve patients and next of kin to prevent unnecessary adverse events related to systemic anticancer treatment. They suggest essential components for preserving patient involvement, and argue that the use of electronic patient-reported outcomes can empower patients in everyday situations, and ensure safety for both patients and their next of kin.

Do patients know what medications they are prescribed? This question is raised by Andfossen and Bergh in chapter four, reporting a study among older patients receiving home healthcare in Norway. By comparing patients' answers as to what medications they were using to the list of prescribed medications for the person, the authors revealed that most of the participants were aware of their medication regimens, although a significant proportion of them were not fully aware. The study results emphasize the need for healthcare personnel to inform patients about their prescribed medications.

Part Two: Medicines

In part two, three chapters deal with potential safety issues related to medicines. The number of available medicines is increasing, and there are increasingly complex medication regimens. Consequently, medication errors are widespread (WHO, 2016).

It is expected that healthcare professionals know how to handle and administer medicines, and that they seek reliable information if they are unsure. However, to what extent is relevant information about the medicine available? In chapter five, Zeiss and Amundstuen describe results from their review of the pharmaceutical preparation monographs in Felleskatalogen®, which is a frequently used source of information for

healthcare professionals administering medicines in Norway. They found that information relating to the modification of oral solid dosage forms varied widely, and that recommendations may be interpreted differently.

Medication interaction is a well-known yet often avoidable cause of patient harm (WHO, 2016). In chapter six, Waaseth, Rønning and Skeie report a study investigating the prevalence of interactions between dietary supplements and medication use in a general population of middle-aged women. Although the prevalence of high-risk interactions was low, the substantial potential for clinically significant interactions indicates that healthcare personnel should take dietary supplements into account when assessing the safety of medication use among their patients.

Assessing the scope and nature of avoidable harm from medicines, and strengthening the monitoring systems to detect and track this harm, is one of the specific objectives described in the medicine without harm strategic framework (WHO, 2017). In chapter seven, Mulac and Granås present an overview of methodologies for detecting adverse drug events and medication errors, and discuss the advantages and limitations of these methods. They reveal a great variation between the methods with regard to detection rate, and demonstrate that none of the methods alone can serve as a gold standard in monitoring medication safety. Instead, a combination of methods should be used to detect adverse drug events and medication errors.

Part Three: Healthcare Professionals

Part three contains six chapters that elucidate how healthcare professionals affect medication safety among patients in community settings. Healthcare professionals are known to pose a risk for medication safety through, for example, their involvement in medicine prescribing, dispensing, administration, and communication (Ofori-Asenso & Agyeman, 2016; WHO, 2017).

Nurses play an important role in medication management in all healthcare settings, but we lack knowledge about their involvement in interventions on medication safety in municipal health and care services. In chapter eight, Sletvold, Jordan, and Olsen describe how nurses can aid

adults in community care in taking their medicines as prescribed, thus achieving medication adherence. The chapter reports a systematic review, in which out of a total of 17 RCTs, four (23,5%) report significant effects on medication adherence, and seven (41,2%) report significant effects on clinical outcomes, such as blood pressure. The nurse-led interventions are typically complex, and target adherence through behaviour and knowledge strategies, such as motivational interviewing, adherence aids, patient education and eHealth components.

As healthcare professionals, pharmacists also contribute to medication safety in municipal health and care services. Chapter nine focuses on pharmacists and their actions to improve quality medication use among patients in nursing homes. In this review, Halvorsen describes and discusses how pharmacists contribute to medication safety on both the healthcare level and the system level. Examples of pharmacist actions are: collaboration in multidisciplinary teams; education in medication management; development of procedures for medication management; management of medication statistics; investigating costs; and facilitating tender rounds. Also, Halvorsen debates whether Norwegian municipalities and the healthcare system lack a strategy for effective use of pharmacists to ensure medication safety.

Medicines sometimes cause serious harm due to communication problems, and good communication between healthcare professionals and patients is vital (WHO, 2017). Chapter ten discusses patient-centered communication and the importance of effective communication skills among healthcare providers to ensure patient safety, and the appropriate use of medicines. In this literature review, Krogstad, Larsen, Holm, Landmark, and Granås explain several communication challenges in medicine information and counselling. Furthermore, the authors discuss experiences with medicine information relating to patient care in transition and at community pharmacies, with regard to for example, prescribed and over the counter medicines.

Healthcare professionals need access to information about patients' health and treatment to provide safe care. Chapter eleven expands our understanding of how healthcare providers experience using medication lists in managing medications used as needed. Based on a secondary

analysis of qualitative data, Nilsen and Bell found that medication lists are important tools to ensure medication safety. Healthcare providers expect updated and unambiguous medication lists. However, medication lists are often ambiguous, and this can pose a challenge for quality of care. Close collaboration with general practitioners is important, and the authors suggest medication reviews as a measure to maintain patient safety.

In chapter twelve, nurses and medical doctors in Norwegian nursing homes and home care services are participants in a qualitative study. Manskow and Kristiansen present in-depth documentation on how the study participants experience access to and exchange of core patient information (CPI). Nurses and medical doctors have extensive experience with situations of inadequate access to CPI, described through challenges of excessive time-consumption, frustration, uncertainty, dependence, complexity, and risk. These challenges are perceived as a threat to patient safety and quality of care, especially in relation to medicine information in patient transitions between levels of care.

Distractions and interruptions during the management of medicines are among factors known to influence medication errors (WHO, 2016). But how the healthcare professionals experience working under such work situations is less known. In chapter thirteen, Alteren elucidate nurses' perspectives on and experiences of work interruptions in nursing homes. Using Gadamer's hermeneutical circle, she developed a sample narrative based on own nursing and research experience, along with narratives shared by nurses during medicine rounds. She discusses the significance of the nurses' perspectives for safe medication management, and concludes that a work interruption can be interruptive or a source of knowledge important for medication treatment and care in nursing homes.

Part Four: Systems and Practices of Medication

The last part of the anthology includes four chapters focusing on aspects of systems and practices of medication. The systems, processes and procedures that healthcare professionals work with are often flawed or

dysfunctional, but can be made more resilient to errors and medication harm if they are well understood and designed (Donaldson et al., 2017). In chapter fourteen, Odberg and Aase describe facilitators of and barriers to safe medication administration in nursing homes. By using data from interviews with staff, and applying a socio-technical systems approach, they reflect on the work system complexity of nursing homes, and how this influences the safety of medication administration. Based on their findings, they suggest that future medication safety interventions in nursing homes should be multifaceted and involve all healthcare personnel, including leaders.

Multidose drug dispensing has in recent years become a common adherence tool for patients receiving multiple medications. But what effect does the tool have on patient safety? Drawing on 60 peer-reviewed articles, Jøsendal, Bergmo and Granås summarize in chapter fifteen the current evidence on the multidose drug dispensing system's effect on patient safety in home-dwelling patients. The studies indicate that multidose drug dispensing can increase medication adherence and reduce discrepancies in medication records. However, it may also result in more medication errors during discharge from hospitals, more inappropriate prescribing, and increase the number of drugs prescribed. The review shows that multidose drug dispensing systems can affect all steps in the medicine-use process, and the authors thus emphasize the need for involving all actors in the process and clearly defining their responsibilities.

Medication-related problems are a common yet potentially avoidable reason for hospital readmissions. In chapter sixteen, Glette and Wiig describe the role of medication management in hospital readmissions in Norwegian primary healthcare services. Drawing on interviews with general practitioners, physicians in nursing homes and hospitals, nurses and leaders in nursing homes, as well as observations in nursing homes, they describe how healthcare personnel perceive medication management as a factor influencing hospital readmissions. In addition, they explore which elements may lead to medication-related hospital readmissions from the primary healthcare service. According to the authors, the study illuminates the need for proper communication tools and well-functioning coordination routines regarding medication management,

as well as a need for expanding the knowledge healthcare personnel have of each other's activities and treatment capacities.

Inadequate medicines knowledge and experience are known to influence medication errors (WHO, 2016). One of the seven strategic objectives of the WHO global patient safety action plan 2021–2030, is to educate, skill, inspire and protect healthcare professionals so that they can contribute to the design and delivery of safe healthcare systems (WHO, 2021). In chapter seventeen, Knutsen, Johnsrud, Slorafoss, Haugen and Joranger report experience, competence and competence needs related to medication management among nurses working in home nursing care and in nursing homes. The vast majority of the nurses answering a quantitative questionnaire, deemed their own competence of medication management to be good or very good, but fewer had confidence in drug interactions, effects and adverse drug reactions of medicines. Few nurses had attended formal medication management training, and few reported making medication errors resulting in patient harm. Based on these results, there is an apparent need for a system that facilitates increased medicines competence and medication management practices among nurses in this context.

Acknowledgements

We would like to extend our sincere gratitude to all the authors for their unique scientific contributions and for collaborating throughout the project, making this anthology possible. We thank the anonymous peer reviewers for their careful reading of our manuscripts, and for providing insightful comments and suggestions. Furthermore, we greatly appreciate the support and commitment of the publisher. The anthology is financially supported through shared contributions from the universities with which the authors are affiliated.

References

- Bates, D. W. & Singh, H. (2018). Two decades since “To Err Is Human”: An assessment of progress and emerging priorities in patient safety. *Health Affairs (Millwood)*, 37(11), 1736–1743. <https://doi.org/10.1377/hlthaff.2018.0738>

- Donaldson, L. J., Kelley, E. T., Dhingra-Kumar, N., Kieny, M. P. & Sheikh, A. (2017). Medication without harm: WHO's third global patient safety challenge. *Lancet*, 389(10080), 1680–1681. [https://doi.org/10.1016/S0140-6736\(17\)31047-4](https://doi.org/10.1016/S0140-6736(17)31047-4)
- Elliot, R. A., Camacho, E., Jankovic, D., Sculpher, M. J. & Faria, R. (2021). Economic analysis of the prevalence and clinical and economic burden of medication error in England. *BMJ Quality & Safety*, 30(2), 96–105. <https://doi.org/10.1136/bmjqs-2019-010206>
- Ofori-Asenso, R. & Agyeman, A. A. (2016). Irrational use of medicines: A summary of key concepts. *Pharmacy (Basel)*, 4(4). <https://doi.org/10.3390/pharmacy4040035>
- Panagioti, M., Khan, K., Keers, R. N., Abuzour, A., Phipps, D., Kontopantelis, E., Bower, P., Campbell, S., Haneef, R., Avery, A. J. & Ashcroft, D. M. (2019). Prevalence, severity, and nature of preventable patient harm across medical care settings: Systematic review and meta-analysis. *BMJ*, 366, l4185. <https://doi.org/10.1136/bmj.l4185>
- The Norwegian Directorate of Health (2020). *In safe hands 24-7*. Accessed from <https://www.itryggehender24-7.no/om-i-trygge-hender-24-7/english/the-norwegian-patient-safety-programme-in-safe-hands>
- World Health Organization. (2016). *Medication errors: Technical series on safer primary care*. Accessed from <https://www.who.int/publications/i/item/9789241511643>
- World Health Organization. (2017). *Medication without harm: Global patient safety challenge on medication safety*. Accessed from <https://www.who.int/initiatives/medication-without-harm>
- World Health Organization. (2019). *Medication Safety in Transitions of Care*. <https://www.who.int/publications/i/item/WHO-UHC-SDS-2019.9>
- World Health Organization. (2021). *Global patient safety action plan 2021–2030: Towards eliminating avoidable harm in health care*. Accessed from <https://www.who.int/teams/integrated-health-services/patient-safety/policy/global-patient-safety-action-plan>