Dispensing Errors as Mismedicine: Cognitive and Ethical Dimensions of Pharmacy Practice

Published: March 16, 2026

Source: mariresearch.com

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Introduction

Dispensing errors in pharmacy practices are common and can pose serious health concerns to patient safety. Some medications may cause severe side effects, and taking the wrong dose can lead to harmful drug interactions. Moreover, these errors raise important ethical and psychological questions about how pharmacists and pharmacy assistants make decisions, perceive responsibility, and apply biomedical ethics principles in their professional practice.

What is a Dispensing Error?

According to records from the College of Pharmacists of British Columbia (2015), commonly reported dispensing errors include the provision of incorrect medications, dosages, or strengths; inaccuracies in labeling; discrepancies in dispensed quantities; the distribution of expired pharmaceutical products; and the failure to identify or mitigate potential drug-drug interactions. Similarly, a recent global meta-analysis by Um et al. (2024) identified wrong medication, incorrect strength, inaccurate quantity, and inappropriate dosage as the most frequent types of dispensing errors. These examples can also be viewed through the broader lens of mismedicine, a term introduced by Dr. Pooya Beigi to describe any medical act that results in harm, inefficiency, or a failure to meet the standard of care. Dispensing errors represent a specific manifestation of mismedicine within the pharmaceutical context, where both cognitive and systemic shortcomings contribute to suboptimal patient outcomes. Across community, hospital, and other pharmacy settings worldwide, the pooled prevalence of dispensing errors was estimated at 1.6%, indicating the persistent risk of medication inaccuracy within pharmaceutical practice (Um et al., 2024).

Contributing Factors and Cognitive Aspects

When pharmacists are interrupted or required to switch rapidly between different tasks, their cognitive and visual processing systems become overextended and therefore increase the likelihood of dispensing the wrong medication. These constant shifts in attention fragment focus, overload working memory, and might increase the likelihood of dispensing errors. According to working memory theory (Amadori et al., 2021), individuals experience a decline in performance when several concurrent tasks draw on the same sensory channel, such as the visual modality. This finding aligns with evidence that tasks heavily dependent on visual input tend to produce higher cognitive strain and impaired decision-making.

Cognitive Overload in Pharmacy Practice

In pharmacy settings, similar mechanisms occur when pharmacists must simultaneously verify prescriptions, label medications, and manage patient interactions; all of which rely on high visual attention and memory. Under such cognitive overload, their ability to process information accurately and detect potential medication errors becomes significantly impaired, even though

they have taken professional ethics training courses. Cognitive strain thus acts as a limiting factor for the effective application of moral reasoning and ethical awareness, as it reduces the pharmacist's capacity for reflective judgment.

Impact of Stress on Decision-Making

When under stress or fatigue, decision-making tends to shift from analytical thinking to more habitual or automatic responses, rather than thoughtful ethical consideration. This narrowing of moral attention can cause pharmacists to focus primarily on immediate technical demands such as completing a prescription quickly. This causes them to unintentionally neglect ethical responsibilities like ensuring patient welfare and preventing harm. According to Dual Process Theory, stress interferes with the brain's analytical system (System 2), which is responsible for slow, conscious, and controlled reasoning, and instead promotes reliance on the intuitive System 1 (Yilmaz & Kafadar, 2022). In this state, executive functions are compromised, and decision-making becomes faster, more emotional, and less reflective. This explains why, during stressful or high-workload conditions, pharmacists may unintentionally depend on automatic decision patterns rather than the careful analytical reasoning required for safe and ethical dispensing, even though they have undergone training related to bioethical and professional ethics training.

Example of Dispensing the Wrong Medication & Patient Communication

A hospital pharmacy mistakenly dispensed an infusion labeled as norepinephrine that contained epinephrine (Majeed et al., 2025). This mislabeling led to the administration of the wrong medication, which can produce completely different physiological effects. The error was discovered during liver transplant surgery when the patient developed severe hemodynamic instability that was resolved only after the correct medication was administered. This incident shows the importance of accurate dispensing and labeling, as well as the potentially severe consequences of such errors. The surgical team's prompt recognition of the mistake prevented further harm and highlighted the essential role of vigilance in ensuring patient safety. Dr. Pooya Beigi also mentioned an instance in which patients came to the pharmacy and were taking sleeping medication instead of their heart medication (Blissy, 2024). This showed that even when the correct medication is dispensed, pharmacists still need to give extra attention and time to review the medications with patients, ensuring they understand what to take, when to take it, and in what quantity. Moreover, effective communication is important so that patients can accurately describe their symptoms, as Dr. Pooya Beigi suggested and ensured that pharmacists understand them, allowing adjustments to the medication if necessary (Blissy, 2024).

Conclusion

Dispensing errors continue to present a serious concern in pharmacy practice, influenced by both technical and cognitive factors. The evidence discussed above shows that frequent interruptions, heavy workloads, and stress can reduce pharmacists' ability to make accurate and ethical decisions, even when they are well-trained. These findings show the importance of minimizing distractions, improving workflow design, and promoting continuous ethical reflection to enhance patient safety. Future research could focus on how emerging technologies might assist pharmacists in managing cognitive load while maintaining professional and ethical standards in daily practice.

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Provided and edited by the members of MARI Research, Error in Medicine Foundation and MISMEDICINE Research Institute, including Emilia Jianing Zhoi, Charmi Patel, Rojina Nariman, and Dr. Pooya Beigi MD. MSc.