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ENHANCING PATIENT SAFETY THROUGH ERROR REDUCTION IN PHARMACEUTICAL DISPENSING PRACTICES IN SOUTH DUBLIN

A Thesis Submitted in Partial Fulfilment of the Requirements for the Degree Master's in Pharmaceutical Business and Technology (QQI)

INNOPHARMA FACULTY OF PHARMACEUTICAL SCIENCE

GRIFFITH COLLEGE, DUBLIN

ANUPRIYA

MAY 26, 2025

CANDIDATE DECLARATION

I declare that the dissertation submitted for evaluation as part of the criteria of obtaining M.Sc. in Pharmaceutical Business and Technology, titled “Enhancing Patient Safety through Error Reduction in Pharmaceutical Dispensing Practices in South Dublin,” is entirely my own work. I confirm that I have adhered to the principles of academic integrity and I have not committed any form of plagiarism whether partially or completely. And all sources and contributions from other people's works have been appropriately acknowledged and cited in the bibliography section.

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ANUPRIYA

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LIST OF ABBREVIATIONS

WHO	WORLD HEALTH ORGANISATION
PSI	PHARMACEUTICAL SOCIETY OF IRELAND
SOP(S)	STANDARD OPERATING PROCEDURE(S)
HER	ELECTRONIC HEALTH RECORD
CPOE	COMPUTERISED PROVIDER ORDER ENTRY
RFID	RADIO-FREQUENCY IDENTIFICATION
HCIS	HEALTHCARE INFORMATION SYSTEMS
PCRS	PRIMARY CARE REIMBURSEMENT SERVICE
MMP	MEDICINES MANAGEMENT PROGRAMME

ABSTRACT

This dissertation investigates how patient safety can be improved by reducing dispensing errors in community pharmacies in South Dublin. Dispensing errors represent a critical risk in the pharmaceutical care process, with the potential to cause anything from minor health issues to life-threatening consequences. The study is guided by three core research questions focused on identifying the most common types of dispensing errors, understanding their underlying causes, evaluating the effectiveness of existing safety strategies and proposing targeted interventions to improve accuracy and patient safety in pharmacy practice.

A qualitative research design, grounded in an interpretivist philosophy, was adopted to explore the perspectives of pharmacy staff regarding dispensing errors and safety practices. Primary data were collected using semi-structured interviews, distributed via Google Forms, allowing participants to respond in a flexible and self-paced manner. Convenience sampling was used to select pharmacists and pharmacy technicians with at least one year of dispensing experience from three community pharmacies in South Dublin. Data were analysed using Braun and Clarke's six-step thematic analysis framework. Ethical approval was obtained from Griffith College, and ethical standards were upheld through informed consent, anonymity, and secure data handling.

The findings revealed that dispensing errors were often linked to human fatigue, workplace distractions, inadequate training, and underuse of available technologies. Although safety measures like Standard Operating Procedures (SOPs), barcode scanning, and double-checking systems were present, inconsistent implementation reduced their effectiveness. The study recommends improving staff training, fostering stronger use of digital tools, and reinforcing procedural compliance to enhance dispensing accuracy. These evidence-based insights can support pharmacy managers, healthcare policymakers, and practitioners in developing safer, more reliable community pharmacy environments.

CHAPTER 1: INTRODUCTION

Dispensing errors in community pharmacy practice pose a significant threat to patient safety and remain a pressing concern in the healthcare landscape. Despite the implementation of various systems and technologies aimed at reducing medication-related errors, community pharmacies—particularly in South Dublin—continue to experience challenges that compromise accuracy and safe medication delivery. With increasing prescription volumes, workforce pressures, and complex medication regimens, there is a critical need to explore the nature of these errors, understand their causes, and evaluate the effectiveness of existing safety interventions. This chapter introduces the context and rationale for the current study, outlines the research aims and objectives, provides an overview of the adopted methodology, and presents the structure of the dissertation. The goal is to establish a foundation for investigating how dispensing practices in community pharmacies can be improved to better protect patients and enhance healthcare outcomes.

1.1. RESEARCH BACKGROUND

Medication errors are of central interest regarding patient safety in pharmaceutical dispensing. Dispensing error, including incorrect dosage, wrong medication, labelling errors and omission of essential instructions, is a threat to patients' health and well-being (Mulac *et al.,* 2021). Ensuring accuracy in medication dispensing is very important in community pharmacy, especially in South Dublin, to prevent any adverse drug reaction and improve overall healthcare outcomes. According to recent research by Chand *et al.,* (2022), dispensing errors constitute approximately 17% of all medication errors in the UK, and the possible reasons behind these errors are human error, high workload pressure, system inefficiency and lack of good communication between healthcare providers and pharmacists (Chand *et al*., 2022).

The World Health Organisation (WHO) has declared medication errors as a major global public health problem resulting in significant morbidity and mortality (WHO, 2019). Drug errors are estimated to cause 700 deaths a year and could contribute to anything between 1,700 and 22,300 other deaths in the UK (Triggle, 2020). The State Claims Agency documented that medication error costs in Ireland reached £98.5 million per year during 2022. There are also considerable financial implications, including that the economic burden of the associated medication errors is

in millions of pounds in Ireland (£98.5 million annually) (State Claims Agency, 2022). Community pharmacies are the primary source of accessing medicines in Ireland (Henman, 2020), meaning that pharmacists play a significant role in addressing patients' safety.

Currently, to reduce the human error involved in dispensing, automated dispensing systems and electronic prescribing have also been introduced (Aljabari & Kadhim, 2021). According to Gates (2021), despite these challenges, cost constraints, lack of standardisation, and resistance to change found in pharmacy settings are challenging in their implementation (Gates *et al.,* 2021). In addition, the risk of dispensing errors is compounded by an ageing population coupled with a chronic disease prevalence exacerbated by the increasing complexity of pharmaceutical care and the need for medications (Aljabari & Kadhim, 2021).

However, little is known about whether any research has been conducted to show the efficiency of error reduction strategies in community pharmacies within South Dublin. To create successful interventions to improve the safety of patients, it is necessary first to discover what kinds of errors of dispensing exist, and secondly to assess what measures are already being undertaken in the name of safety. To address this disparity, this dissertation seeks to examine the dispensing errors that have resulted in Irish pharmacies being reported by examining the cause(s) of this error, evaluating existing ways to mitigate this error, and presenting evidence-based solutions for the improvement of safety protocols to pharmacies throughout South Dublin.

1.2. RESEARCH JUSTIFICATION

The increasing rate of medicine mistakes in connection with both medication dispensing as well as patient health alone means the requirement of the research for this research. The PSI claims that medicine safety is a major worry, with the number of dispensing blunders increasing and that consistent improvements are necessary for pharmacy practice. Health consequences of mislabelled medications and dosing blunders, along with drug name mix-ups, have shown life-threatening effects and obligatory hospitalisation, as mentioned by Khoury and Usta (2024). Mistakes concerning labelling, calibrating dosages and fluctuating medication names can lead to a high ratio of health-related issues, hospitalisation or fatality (Khoury & Usta, 2024).

The large number of community prescriptions filled daily in pharmacies justifies the high importance of this study. Community prescriptions dispensed daily in community pharmacies are

usually in high volume, making the research more relevant. The community pharmacies dominated dispensing activity in Northern Ireland, accounting for 99.3% of all items dispensed (HSCI, 2024). The given volume means that even a small percentage of errors can be very consequential to patient safety and public health. According to Sinclair (2019), pharmacists work in high-pressure conditions that increase their error rate. They found that, according to studies, dispensing mistakes are primarily caused by pressures of the workload, distractions, and not having a double-check mechanism (Sinclair, 2019). (Sinclair, 2019).

The researcher is also motivated by an interest in healthcare quality improvement and pharmaceutical safety, which is why this study is also motivated. Medication errors persist, and understanding weaknesses in current dispensing practices and appraising the current safety measures can help in developing effective solutions (Gates *et al.,* 2021). The expected results from this research would be a set of realistic recommendations for pharmacies in South Dublin to improve their dispensing system and consequently reduce the prevalence of medication errors. Through the identification of key risk factors and gaps in the current safety measures, this study will provide contributions to policy dialogues and serve as a basis for best practices in pharmaceutical dispensing.

1.3. RESEARCH AIM AND OBJECTIVES

The main goal of this research is to enhance patient safety in providing them so that dispensing errors produced in community South Dublin pharmacies can be identified, analysed and diminished with current security measures evaluated and a number centred touching interventions constructed.

Research objectives

- To characterise the types of dispensing errors occurring in the selected pharmacies and determine the root cause analysis of these errors, to figure out the patterns and prevent the recurrence of these events.
- To audit existing error reduction strategies and safety checks in the selected community pharmacies in South Dublin and evaluate the effectiveness of these strategies to improve patient safety

- To design and suggest tailored approaches to minimise dispensing mistakes and enhance patient safety in selected pharmacies.

1.4. METHODOLOGICAL APPROACH

The study adopted semi-structured interviews as its qualitative research method to access extensive data from pharmacy professionals about errors in medication distribution and safety measures. The researcher applied convenience sampling to recruit 10 pharmacy staffs who showed both relevant expertise and willingness to participate in the study according to Etikan *et al.,* (2016). The interviews established which dispensing errors were displayed by staff and discussed ways to enhance safety protocols. Braun and Clarke's (2006) approach to thematic data analysis served as the method by which research participants' data patterns and themes were identified for creating actionable recommendations that decrease dispensing errors and boost patient safety outcomes.

1.5. CHAPTER OUTLINE

Chapter One: Introduction / Overview

In this chapter, background information, research rationale, objectives and methodology overview are presented to create the research topic.

Chapter Two: Literature Review

This chapter examines the studies on dispensing errors, patient safety, and error reduction strategies and discusses technological interventions found in pharmaceutical practice.

Chapter Three: Research Methodology

This chapter outlines the methodological approach adopted for this study.

Chapter Four: Presentation & Analysis of Findings

The findings of the research, which have been most significant, include key themes that emerge from the themes and patterns found in the data collected.

Chapter Five: Conclusions and Recommendations

The key findings are summarised, their implications and recommendations are made for how to improve dispensing practices in South Dublin pharmacies by this chapter.

1.6. CONCLUSION

This chapter gave an overview of the research background, justification, aim and methodology. It emphasises the importance of correcting dispensing errors in enhancing patient safety and the necessity for targeted intervention. In the next chapter, medication errors, safety strategies and best practices in pharmaceutical dispensing are reviewed to underpin the theoretical basis for this study.

CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

Medication dispensing errors present a major danger for both patient security and successful medical treatment. Patient deaths and medication-induced adverse reactions, and unwanted hospital visits emerge as direct outcomes from such medical mistakes (Khoury & Usta, 2024). A comprehensive review is presented in this chapter about relevant literature which explores principal dispensing error factors in addition to their health and safety effects on patients, as well as current risk reduction tactics. The research evaluates whether current safety measures are suitable and impactful for use in South Dublin community pharmacies through an analysis of available medical evidence that improves medication systems.

2.2 MEDICATION ERRORS AND THEIR IMPACT ON PATIENT SAFETY

2.2.1 Definition of Medication Errors

Patient error refers to a wide range of mistakes that are made during the prescription, dispensing, or prescribing of a medication. These errors can include over- or under-dosages, incorrect medications, incorrect labelling and omissions of essential directions. Wrong dosages are riskier as they can cause intoxication or underdose, leading to any type of harm or none of the goals of the therapy (Aljabari & Kadhim, 2021). Thus, administering the wrong drug can result in severe outcomes when a patient is given the wrongdoing medication that causes adverse effects or interacts with other drugs (Mulac *et al.*, 2021). Aljabari and Kadhim (2021) explain that errors in prescription information regarding drug labels and verbal and written instructions can cause patients to use medications improperly, thus creating additional treatment complications. Human or unit strength inefficiencies lead to notable safety threats for both patients and their health outcomes in a large number of such cases. These errors are frequently due to human factors or Unit Strength inefficiencies, however represent a big threat to patient safety and health outcomes (Granel-Giménez *et al*., 2022).

2.2.2 Consequences of Medication Errors

The repercussions of medication mistakes can be very dangerous, ranging from mild to severe health complications that can even be life-threatening. Khoury and Usta (2024) point out that discharge errors, including wrong medication or dosages, may lead to hospitalisation and, in some cases, even death. Inaccurate dosing can cause severe consequences like organ failure, cardiac arrhythmias, or drug toxicity, mainly in patients with any previous medical history (Tariq *et al*., 2024). Extraneous amounts of a medication may lead to acute poisoning and deficiency may carry out the intended therapeutic effect, delaying the patient's illness are prolonging the disease progression (Trakulsunti *et al*., 2022). Additionally, medications are misused because of labelling failures, like wrong time or dosage suggestions. Patients who misuse medication because of mislabelling errors may encounter unanticipated health problems that need medical care. These errors not only damage patients but can also significantly boost healthcare costs related to prolonged hospital stays, extra treatments and medical misfortunes that develop from mistakes (Farideh Namadi *et al*., 2024).

2.2.3 Economic Impact of Medication Errors

Hospital systems, along with society, face significant economic costs from medication errors, which simultaneously endanger patient safety. The healthcare system incurs multiple expenses as a result of extended hospital durations and supplemental treatments, together with legal proceedings and diminished worker output caused by patient health complications. The World Health Organisation (2019) reports that medication-related harm generates a global yearly cost of USD 42 billion, which mainly represents preventable expenses. The State Claims Agency (2022) reported that Irish health services pay £98.5 million each year due to medication errors. The expenses related to medication errors cover additional emergency clinic calls, more drawn-out treatment, and physical treatment, as well as legal and administrative expenses for improper examination and client grievances. The State Claims Agency (2022) established that medication errors in Ireland create annual healthcare costs of £98.5 million. These errors create a major economic challenge for Ireland's health care system, according to this report. Incorrect medication dispensing, along with adverse drug events and associated administrative and legal costs, result in healthcare system expenses during hospital stays and repeated treatments. These costs happen because of the obligatory corrective medical therapies, longer periods of hospital admission and potential legal suits in cases where errors in dispensing resulted in injury. Gates *et al*.,(2021) stated

that hospital medication errors not only add to the direct healthcare expenditure of patients but also add to the financial loss because patients, who are victims of medication errors, have to miss work time to recover and undergo further treatment of their condition. The costs go beyond the healthcare sector, hitting society, affecting a person's work, and raising insurance premiums and legal fees and costs (Jones & Dolsten, 2024).

2.2.4 Global and Local Statistics

Medication errors constitute a significant worldwide health problem, according to World Health Organisation data from 2019, since they lead to considerable patient harm and affect healthcare systems worldwide with a significant cost burden. The World Health Organisation demonstrates that medication-related harm ranks as a primary source of hospital injuries that create avoidable health consequences, which affect about one in ten hospitalised patients worldwide. Medical problems in the world lead to about 5% of all allergy hospital admissions and therefore represent one of the farthest available paths for unthinking damage (WHO, 2019). Medication errors are a major problem in Ireland, as per Chand *et al.,* (2022), of which 17% of all medication errors reported are dispensing errors. These data provide the commonality of medication errors, individuals involved in real cases, and recent new defence evidence clarify the law in this area, with direct impact on patient outcomes. The WHO (2019) estimates 700 deaths in the UK annually due to medication errors, with a higher global figure of 1.700 to 22.300 deaths. These numbers emphasise how important it is for error-prevention measures to be taken in drug dispensing to ensure the safety of the public and prevent harm to patients. Local data from the State Claims Agency (2022) also provides proof of rising amounts of drug-related injuries in Ireland, prompting concentrated intervention in urban pharmacies to treat the problem.

2.2.5 Definition of Dispensing Errors

The preparation process of medication services for patients often results in unintended mistakes when healthcare providers make errors in deciding which drugs to give patients and their correct amounts, and proper labels and educational materials (PSI, 2022; James *et al.,* 2009).

Types of Dispensing Errors

Among all medication errors that occur in pharmacy practice dispensing errors represent the most frequent type as they happen when preparing and delivering medication to patients. Such errors

lead to various negative effects on patients including harm together with treatment failure and added healthcare expenses. The categorization of dispensing errors includes three main groups based on the findings of Tariq *et al.,* (2024).

Pharmacists provide patients with medications other than their prescribed ones due to similar drug names, such as Celebrex vs. Celexa.

- The provision of medication at an incorrect dose rate or strength, between 100 mg instead of the prescribed 10 mg, leads to overdose or underdose conditions.
- A wrong dosage delivered in either excessive or insufficient amounts will alter the length of time for treatment.
- Patients become confused when container labels or instruction information are inaccurate.
- A patient receiving no medication at all from their prescription defines an Omission Error.
- The drug supplier gives the patient an unsuitable alternative medication formulation when they switch from liquid to tablets.
- Pharmacies must avoid giving medicines with expired dates because it reduces both their safety profile and therapeutic effectiveness.
- Errors during prescription entry in the pharmacy system database can produce subsequent dispensing problems because of documentation mistakes.
- Different medication errors derive from several elements that encompass high workloads, along with distractions and similar drug names and insufficient staff education and deficient information exchange methods (Hassell *et al.,* 2011).

2.3 CAUSES OF DISPENSING ERRORS

2.3.1 Human Factors

Human errors are a major explanation of dispensing errors in community pharmacies. The role that is performed by a person's aspects in medication mistakes must not be disregarded because these mistakes will be, when necessary, a mix of a cognitive load, exhaustion, distraction and inadequate verification guidelines (Ledlow, 2024). People working in understaffed pharmacy settings encounter heavy workload demands, together with communication challenges that raise the probability of medication dispensing errors. Sinclair (2019) argues that pharmacists with stressful environments. Fatigue, paired with repeated multitasking demanded in pharmacy, goes

against possibility and evaluative capacity, therefore creating errors in prescription filling. The absence of a consistent double-check mechanism, which boils down to another practitioner double-checking the medication that has been dispensed, amplifies the risks of human errors, particularly in extra-staff pharmacies (Chand, 2022).

Human-related errors during medication dispensing result in wrong doses, incorrect selections of medications and false labels among healthcare providers. Extended working hours cause pharmacists to miss important medication details like drug name and dosage, and expiration dates, which leads to dispensing of an inappropriate medication. Studies by Hassell *et al.,* (2011) show that such medication errors mainly arise from workplace distractions, together with high workloads and pharmacy professional exhaustion. Furthermore, when pharmacy staff are interrupted or busy, it may alternatively compromise the verification of the patient information or pluralisation of prescriptions and generate several possible dangerous loops for the patients. According to Sinclair (2019), human mistakes lead to dispensing errors and indicate the necessity of stronger staff management, better working conditions, improved error-inspection devices and improved lighting.

2.3.2 Systemic and Environmental Factors

Pharmacy systems coupled with the workplace environment and inefficient work procedures result in medication errors. In recent research by Elshayib and Pawola (2020) explained that suboptimal pharmacy workflows combined with nonstandard procedures and deficient medication inventory management lead to elevated error counts. Pharmacy systems that do not emphasise safety checks or identify drug interactions, therefore, increase the number of potential dispensing mistakes. The dependence on human input in manual prescription and patient data tracking systems leads to possible errors because such information is prone to failure.

Workplace conditions in community pharmacies directly impact the number of medication errors experienced by patients. The authors of Trakulsunti *et al.,* (2022) maintain that pharmacies that are disordered or overly noisy impair pharmacists' focus, which leads to dispensing mistakes. The combination of inadequate dispensing areas with faulty labelling procedures causes additional risks for dispensing the wrong medications. Insufficient numbers of staff members at pharmacies create immediate workloads that force pharmacists to hurry their work, thus raising the likelihood of mistakes. The pace and stress of filling prescriptions in a pharmacy continuously worsen thus increasing the likelihood of medication mistakes. Disorderly communication between pharmacy

staff members or between pharmacists and healthcare professionals has been identified as a factor behind misunderstandings, which generate dispensing errors by Elshayib and Pawola (2020).

2.3.3 Technological Limitations

Although technological developments in pharmacy practice, e.g. automated dispensing systems, and electronic prescribing can decrease human mistakes, such displacement remains limited because of several obstacles. Gates *et al.,* (2021) note that whereas automation in dispensing has been shown to decrease the likelihood of medicine errors, the comprehensive roll-out of automated systems is associated with significant problems, particularly in the age of costs and proprioceptive organisational opposition to changes in pharmacist settings. Autonomous dispensing systems cost too much for smaller independent pharmacies to afford most of the time. Staff often demonstrate resistance to new technology adoption at work because they fear job loss, along with disruptions in their workflow processes and being unfamiliar with the new systems. Gates *et al.,* (2021) identified these elements as major contributors to the opposition that prevents automation from taking hold in pharmacy workplaces.

While this hallway electronic prescribing has led to reduced rates of medication errors resulting from acknowledgeable handwriting description, technical limitations, challenges, many system incompatibilities, insufficient user training and safety on data have a serious impact on the continued use of electronic prescribing. Electronics systems can lead to errors even if integrated with other ambulances of healthcare technology platforms; technology faults, delayed data transfer, and communication between diverse systems (Aljabari & Kadhim, 2021). Also, pharmacists must be properly educated on how to apply these technologies for them to be effective (Martini *et al.,* 2024). Furthermore, the lack of reporting training can dissuade the potential benefits of behalf of these. Therefore, though technology has a lot to offer, the technology's limitations and obstacles to uptake need to be disabled if it is to be able to fully achieve its capacity to reduce error (Gates *et al.,* 2021).

2.3.4 Other Contributing Factors

The heavy workload, along with limited time to cope and insufficient provider communication, strengthens conditions that lead to medication dispensing mistakes. According to Seys *et al.*, (2013), large patient volumes in pharmacies drive pharmacists to choose speed over accuracy in their work processes. Thus, staff members make prescription errors while they aim to complete

their workload fast enough to neglect medication verification procedures. The speed-pressured task of meeting patient needs and adhering to shortened medication dispensation periods creates situations that link both technical errors to human weakness and operational flaws.

The lack of effective communication between pharmacists and prescribing physicians, together with other healthcare staff members, leads to medication errors. According to Grol *et al.,* (2013), improper communication between healthcare providers, together with unclear information exchange, leads to mis prescription or mis dispensing of medications. Unspecified or ambiguously written prescription information leads healthcare providers to not correctly understand the drug plan, as well as dosing requirements and use instructions. There exist instances where patients fail to grasp sufficient medication information from inadequate healthcare provider communication, which results in wrong medication usage and subsequent errors. Healthcare professionals must intensify their collaborative approach because several miscommunications prove that patients need precise medications alongside proper treatment protocols.

Multiple human errors, together with systemic problems, technology shortcomings and environmental influences, motivate the occurrence of dispensing errors in community pharmacies. Community pharmacies face multiple human error factors, including work-related fatigue, workload burdens and distracting conditions, which become worse because of inadequate system design, inadequate workplace accommodation and staff shortage. Human errors stemming from workforce pressures and disrupted attention frequently lead to dispensing errors (Sinclair, 2019), highlighting the significant role of individual-level mistakes under stressful conditions.

However, this emphasis on individual error is challenged by Gates *et al.,* (2021), who argue that such mistakes are more accurately attributed to organizational weaknesses such as poor workflow design and inadequate training. From this perspective, dispensing errors arise not from momentary lapses by individuals, but from failures in system design that create error-prone environments. Furthermore, while reducing human error through improved management practices and continuous training has shown promise, such measures often receive limited attention in discussions dominated by external or pressure-based explanations. This contrast in perspectives highlights an ongoing debate in the literature about whether dispensing errors should be primarily viewed as human or systemic failures.

The implementation of modern technology would help minimise these medication errors; however, cost issues, staff reluctance to adopt new methods, and weak connectivity remain obstacles to their widespread use. High patient demand, along with communication issues between staff, creates additional difficulty for the problem. The problem of dispensing errors requires improvement through the identification and resolution of contributing factors because it affects patient safety outcomes in community pharmacies (Gates *et al.,* 2021).

2.4 ERROR REDUCTION STRATEGIES AND BEST PRACTICES

2.4.1 Current Error Reduction Methods

Includes the medication error decrease strategies in pharmacy dispensing devices that aim to prevent the issues related to the medicine mistakes so for patient safety. One of the most effective techniques of error prevention is the operation of double-checking systems. This device, which is used by one pharmacist or pharmacy technician to check the medication or dosage just before dispensing, may help detect background ambient noise that would otherwise have gone undetected. Double checking is critical where huge volumes are being processed at sites since the threat of fault or wrong pass is very high. The performance audit of a second review of prescriptions and dispensed medications drastically decreases the likelihood of human mistake, conclude Chand *et al.*, (2022). Additionally, standard operating procedures (SOPS) are crucial for maintaining consistently high principles and compliance with best practices for every task carried out in the pharmacy. SOPS give detailed instructions to pharmacists in handling and checking prescriptions to minimise the variability in the dispensing of drugs (Grol *et al.,* 2013). SOPS Implementation leads to every procedure with the dispensing process being reviewed, evaluated, and created to a standard procedure within specified time frames, taking into consideration that all procedures can be overlooked and neglected, and errors as a result.

Augmentative employee learning is another important component of mistake reduction. As medical treatments, technologies, and methods are always evolving, there must be a current pharmacist for them to be in that field. The penalty also includes recurrent training classes to instruct staff in the drug security danger mindset and medicine management education. Any such programmes should include hands-on training components, such as case studies and simulation training for pharmacists to be better prepared for real-life practising (Chand *et al.,* 2022). Training

should also encompass self-error detection and reporting, and encouragement of a safety culture within the pharmacy setting.

Double-checking systems alongside standardised operating procedures (SOPS) shows an ability to decrease errors according to Chand *et al.,* (2022). Studies demonstrate that these solutions deliver reliable outcomes, but they do not address the basic issues, which include excessive workload and insufficient training among staff members. The implementation of these approaches might produce compliance results but fails to solve underlying problems, according to Grol *et al.*, (2013).

2.4.2 Technological Interventions

Hospitals use electronic medication systems and automated dispensing systems more often as tools to prevent medication errors. Partial medication dispensing systems function to remove errors made through human interaction since they provide proper medicine distribution. The tracking and matching operations within these systems are based on barcode scanners along with additional technology which links medications to patient documentation. Automated medication dispensing, together with e-prescribing, has been found by Gates *et al*., (2021) to decrease medical errors that stem from illegible handwritten prescriptions and manual data entry processes. Advanced dispensing technologies monitor drug-to-drug interactions together with allergies and drug contraindications to prevent adverse patient outcomes. Technological interventions which demonstrate effectiveness at decreasing human error create new obstacles during their implementation. Pharmacies face implementation barriers because the sophisticated systems come with expensive deployment costs, staff pushback, and limited interface standards between clinics (Gates *et al*., 2021). Proper integration and correct utilisation make electronic medication systems with automated dispensing technologies enhance patient safety and pharmaceutical dispensing efficiency despite the initial challenges of implementation.

The study by Gates *et al.,* (2021) shows that autonomous dispensing systems operate as a fundamental technology that decreases drug delivery errors. While critics have identified key obstacles in implementing these technological solutions. The preventive power of technology against errors diminishes because of the expense involved and the resistance from staff and integration problems with current systems (Gates *et al.,* 2021). Technological solutions address insufficiencies for entirely resolving dispensing errors in healthcare.

2.4.3 Best Practices from Other Industries

The improvement method Lean Six Sigma integrates waste reduction concepts of Lean with variability decrease capabilities of Six Sigma to optimise systems (Antony *et al.,* 2017). When utilised by pharmacies, Lean Six Sigma provides benefits for medication safety because it strengthens workflow management and establishes standard procedures through which dispensing errors decrease. Application of this methodology in healthcare achieves three key outcomes: reduction of repetition, together with operational enhancement and improved patient safety results. Trakulsunti *et al.,* (2022) demonstrated that healthcare programs prefer Lean Six Sigma because nurses remove redundant processes, standardise procedures, and decrease operational variation to reduce medication errors. Consolidated labelling practices within medication order verification systems lead to improved workflow processes alongside decreased dispensing error occurrences, according to Trakulsunti *et al*., (2022).

2.4.4 Training and Education

According to Seys *et al.,* (2013), pharmacists need psychosocial support to avoid burnout since it leads to errors in their work. Cognitive performance suffers from burnout, whose causes include stressful working conditions or excessive workload, which leads pharmacists to make medicine dispensing mistakes. Including professional development, which provides pharmacists with mental well-being and stress management resources, helps decrease the frequency of errors related to their physical and emotional exhaustion (Rehman *et al.,* 2025).

The effective reduction of medical errors depends on pharmacist education regarding incident reporting, along with the establishment of a safe environment for reporting mistakes within their workplace (Ahmed & RAHMAN, 2025). Staff who feel protected from retaliation for mistake reporting establish a fast response time for error correction (Mohiuddin, 2020). Pharmacy training must provide essential components which support transparency and accountability systems because these will lead to better overall safety performance in pharmacies.

2.5. TECHNOLOGICAL ADVANCEMENTS AND THEIR ROLE IN ERROR REDUCTION

2.5.1 Electronic Medication Systems

The most significant technological innovation in drugstore practice lies in electronic medication management computerised systems updated with technology for e-prescribing and automatic dispensing (Gebrehiwot *et al.,* 2025). Studies have proven that these systems contribute to a

decrease in medication errors and enhance patient safety. The e-prescribing program corrects the imperfections of poor handwriting that frequently cause prescription errors (Gates *et al.,* 2021). Electronic prescription transmission permits patients' healthcare practitioners to transmit their prescriptions electronically appropriately to pharmacies, which helps in the reduction of associated misinterpretation of prescriptions occurring between medical professionals and pharmacists. The use of bar codes and RFID technology automates dispensing devices to ensure the issuance of correct medication to the proper patient with the track and dispensing functions (Nirmala Devi M *et al.,* 2024).

This Electronic system has added value for the users in their work. Three essential functions that electronic systems perform are minimising the mistakes that either the personal prescribers and dispensers make, accurately putting up the results, and certainly identifying drug interaction mixes and patient allergies and medication adjustments real-time. Automated systems also enhance pharmacy workflow, which enable pharmacists to have more time for clinical purposes and patient consultations as mentioned by Trakulsunti *et al.*, (2022). Moreover, integration with other HealthCare Information Systems (HCIS) systems, like patient data/record systems, lab data, enables ruling making capabilities gifted using those systems.

The advantages of electronic drug administration systems have been established for a considerable time; however, there are both considerable barriers to range as well as access which prevent them from being commonly used of. The expensive payment to install those devices keep it out to mostly pharmacy and small health centre because it cost a small budge (Gates *et al.,* 2021). Cost of installation for electronic medical systems is also the first cost of hardware and software plus overheads over and above and on a regular basis need for maintenance and software up-dates as well as cost for staff training. Benefits of an ongoing economic nature, like reduced errors and increased productivity, do not encourage pharmacies to buy expensive technology since the pharmacies lack the money to buy this software.

2.5.2 Barriers to Technology Adoption

Multiple factors beyond high expense factors stand as hurdles when healthcare organizations attempt to implement electronic medication systems. Standardization problems between various healthcare centers and technological systems act as the main impediment (Aljabari & Kadhim, 2021). The integration of electronic prescribing systems with automated dispensing solutions

becomes challenging when they need to link with EHRs that have incompatible or poor integration capabilities. The absence of interoperability between healthcare information systems creates separation between patient data which produces both information distribution mistakes and operational delays in medical services.

Healthcare staff resistance to change stands as the main obstacle that prevents the implementation of new technology systems. Staff members who serve as pharmacists alongside other healthcare providers tend to show hesitation when adopting new systems because they believe the transition will disturb their current work patterns and force them to acquire new competencies. Gates *et al*., (2021) report that resistance leads to delays or complete prevention of e-prescribing and automated dispensing system implementation. New technology acceptance can decrease through learning difficulties that produce early suboptimal performance and mistakes.

The pharmacists in smaller community pharmacies show doubts about these technologies since their staff uses traditional approaches. The strongest opposition to new systems mainly emerges from teams facing high patient demand since extra technology often appears like another complex task to handle. The implementation of technological interventions requires adequate support and training to overcome staff resistance that ensures their successful deployment.

2.5.3 Case Studies of Technology in Action

Although it may be hard, there are some instances of newer electronic medication systems working quite well within several different healthcare settings. Healthcare providers of Los Angeles-based hospitals were capable of decreasing the medication complications in the patients and inpatient unit by lake notch, with those who used of computerised provider order entry (CPOE) system (Elshayib & Pawola, 2020). This enabled healthcare practitioners to place electronic medication orders as opposed to handwritten orders and reduced opportunities for prescription transcription mistakes. Also, the system sent live alerts for possible drug interactions, allergies, and incorrect dosages and patient care improved (Menachemi & Collum, 2011).

Automated dispensing systems of hospitals in the United States and Europe. In numerous hospitals that have introduced automated dispensing cabinets, as utilised in the UK National Health Service (NHS)'s hospital systems, it is reported that medication errors made because of contraptions being given off and drug dosages have been decreased by half (Grol *et al.,* 2013). The automated systems have made it possible for a more accurate dispensation of medication, so that the drug that was

incorporated was dispensed in the proper dosage. The integration also enabled the systems to be combined with both e-prescribing systems and electronic health records (EHR), thus delivering a workflow that improved the efficiency and accuracy of the dispensing process (Hareem *et al.,* 2024).

E-prescribing systems bring beneficial results to Australian and United States community pharmacies beyond hospital environments. The adoption of these systems decreased medication errors to a substantial extent because they resolved the problems representing illegible handwriting and physician-pharmacist communication breakdowns. Ceramidas and Parker (2010) conducted research in Australian community pharmacies, which demonstrated that electronic prescribing reduced medication errors by 30% while enhancing prescription quality and communication.

2.6. THE ROLE OF COMMUNITY PHARMACIES IN SOUTH DUBLIN

2.6.1. Overview of Community Pharmacies in South Dublin

Community pharmacies play a very important role within the Healthcare System in South Dublin as they provide primary access to treatments, health guidance and Services that contribute to patient well-being. These pharmacies are crucial to access medicines by the citizen, varying between the provision of multiple services, prescription, health screening, vaccination prescription, and counselling for lifestyle improvement (Riad, 2024). Henman (2020) also states that community pharmacy services in Ireland are essential in providing access to medication, with pharmacists performing as professional practitioners going beyond the transfer of the prescription to inform patients on appropriate drug use, side effect risks, drug interaction considerations, and so on.

Patients in South Dublin rely on community pharmacies to reach out for medication services, which include both medicine distribution with safe administration methods that lower drug-related safety risks. Community pharmacies hold paramount importance in validating medical prescriptions while monitoring drug interactions, as well as correcting medicine label errors and dosage inaccuracies. The research by Khaira *et al.,* (2020) demonstrates that Irish community pharmacists operate as first-line guardians for medication security which lowers both hospital strain and emergency service demands through minor condition management and error reduction efforts.

2.6.2 Specific Challenges in South Dublin

Community pharmacies in South Dublin perform essential work yet encounter various obstacles which inhibit their capacity to give optimal care to patients. Pharmacies throughout South Dublin battle with the high number of prescriptions they need to fill each day. According to Henman (2020) one of the main issues in busy urban pharmacies like those in South Dublin exists in the vast number of prescriptions that staff need to expedite because this creates conditions where errors become more frequent. During times of patient volume increase and staff lack the deadline for prescription review becomes shorter which results in higher chance of pharmacists missing critical errors in dispensing. The Pharmaceutical Society of Ireland (PSI, 2021) identifies escalating workloads combined with insufficient staffing levels as primary factors that produce dispensing pressure which negatively affects medication security.

Workforce pressure constitutes a major contributing factor within pharmacies. Pharmacists together with pharmacy technicians in South Dublin operate in quick-paced settings that face high medication requests while having brief durations to examine each prescription. According to Sinclair (2019) challenging working situations and urgent patient need requirements create conditions which result in human errors that include wrong dosage administration along with medication leaving out and label inaccuracies. Working at excessive duration with large numbers of patients creates stress and fatigue which worsens these concerns and increases the probability of mistakes that harm patient safety (Pickup *et al*., 2025).

The problem of medication errors worsens because of various systemic weaknesses throughout pharmacy operations including dated technology inadequate provider collaboration and the absence of official protocols (Soori, 2024). The lack of an efficient prescription checking system creates conditions which increase the risk of drug errors involving prescription details and drug compatibility as well as medication labels according to Chand *et al.,* (2022). Community pharmacies often face inefficiencies since they lack the funding to purchase modern technologies or find new employees to handle rising work demands.

2.6.3 Overview of Community Pharmacies in South Dublin

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citizen, varying between the provision of multiple services, prescription, health screening, vaccination prescription, and counselling for lifestyle improvement. Henman (2020) also states that community pharmacy services in Ireland are essential in providing access to medication, with pharmacists performing as professional practitioners going beyond the transfer of the prescription to inform patients on appropriate drug use, side effect risks drug interaction considerations, and so on.

Community pharmacies in South Dublin fulfil duties which reach past medication dispensing services. Community pharmacies serve an essential function by ensuring medicine safety and preventing drug-based errors in administrative practices. Community pharmacists operate as frontline protectors who identify drug interactions and verify dosages and perform proper labelling functions to decrease medication-related injuries. Irish community pharmacists participate actively in improving public health results by boosting medication security measures and lessening strains on secondary medical institutions such as hospitals and emergency departments (Raiche *et al.,* 2020).

Whitehall supports healthcare strategies including the Primary Care Reimbursement Service (PCRS) and the Health Service Executive's Medicines Management Programme (MMP) through which South Dublin community pharmacies enhance patient care and maintain medication safety. Quality assurance protocols and routine audits together with safety evaluations found within these programs help community pharmacies distribute medications effectively and protect patient health (Health Service Executive, 2022). The programs possess quality assurance protocols as well as routine audits and safety exams that confirm pharmacies maintain optimal practices for medication distribution and protective patient safety (Henman, 2020). These initiatives serve two goals: minimising errors and developing a safety-oriented workplace atmosphere that lets personnel report mistakes and present process enhancement techniques.

2.7. CONCLUSION

Medication mistakes in community pharmacies are a considerable risk to patient safety, bringing about all the more severe medical issues from minor to serious, leading to hospitalisation and even hostility (Mulac *et al.,* 2021). These errors are usually attributed to human factors such as personal faultiness, loaders' thrusts and missing double communication systems (Sinclair, 2019), mishaps system (Chand *et al*., 2022), old systems and communication. Technologic reasons like electronic

medicine frameworks and programmed presentations profit a considerable measure as such by trimming these mistakes by offering careful and adept in any case, confinements such as high costs and non-before styles to transform keep on (Gates *et al*., 2021) The adoption of positive practices from other industries, such as Lean Six Sigma has displayed the possibility of improving pharmacy processes, reducing errors (Trakulsunti, 2022). The existing research demonstrates the significance of maintaining ongoing staff training alongside defined documentation methods to avoid dispensing errors (Mohiuddin, 2020). After analysing the findings, this next chapter describes the research method to investigate current medication safety procedures and employee training practices, along with error prevention strategies in South Dublin pharmacies.

CHAPTER 3: METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research methodology used to investigate the reduction of dispensing errors as well as the improvement of patient safety in community pharmacies in South Dublin. It provides a structured way to conduct the study of the research aim, questions, design, data collection method, sampling strategy, and ethical considerations. It will also explain how reliability and validity will be ensured, and how data will be analysed using a thematic framework. The research is a qualitative approach taking the interpretivist philosophy in understanding the experiences and perceptions of pharmacy staff in the dispensing process. The key data collection method will be semi-structured interviews, and participants will be selected via convenience sampling from a sample of community pharmacies. The thematic analysis method will be used to identify the patterns and to evolve insights.

3.2 RESEARCH AIM

The purpose of this study is to enhance patient safety by identifying, analyzing and minimizing dispensing errors in selected community pharmacies in South Dublin. The types of dispensing errors, the causes and the strategies currently used to reduce them in these settings will be assessed. Additionally, the study aims to devise targeted interventions (for pharmacy practice) that enhance the accuracy of pharmaceutical dispensing. The purpose of these objectives is to offer a full understanding of current practices and to offer suggestions for making dispensing processes safer.

3.3 RESEARCH QUESTIONS

- What are the most common types of dispensing errors occurring in selected community pharmacies in South Dublin?
- What are the underlying causes contributing to these dispensing errors from the perspective of pharmacy staff?
- How effective are the current error reduction strategies and safety checks implemented in the selected pharmacies?

- What targeted interventions can be proposed to improve patient safety and reduce dispensing errors in community pharmacy settings?

3.4 RESEARCH OVERVIEW TABLE

Research Question	Assessed
What are the most common types of dispensing errors occurring in selected community pharmacies in South Dublin?	Semi-Structured Interview Q1. Can you describe the most common types of dispensing errors you have encountered in your pharmacy?
What are the underlying causes contributing to these dispensing errors from the perspective of pharmacy staff?	Semi-Structured Interview Q2. What do you think are the main reasons behind these dispensing errors? Q3. Have you noticed any patterns in when or why errors occur?
How effective are the current error reduction strategies and safety checks implemented in the selected pharmacies?	Semi-Structured Interview Q4. What safety checks or procedures does your pharmacy have in place to prevent errors? Q5. How effective do you think your pharmacy's current error strategies are?
What targeted interventions can be proposed to improve patient safety and reduce dispensing errors in the selected pharmacies?	Semi-Structured Interview Q6. What improvements or additional measures do you think could further reduce dispensing errors in your pharmacy?
What role do training, technology, and teamwork play in reducing dispensing errors and enhancing patient safety?	Semi-Structured Interview Q7. Are there any specific tools or technologies that you use to reduce dispensing errors? Q8. Have you received any training on preventing dispensing errors?

	Q9. How do you think pharmacists and staff can work better together to improve patient safety in dispensing practices?

Table 3.1.Research Overview Table

3.5 RESEARCH DESIGN

A qualitative research design will be used in this study to examine pharmacy staff's perspectives on dispensing errors and patient safety in community pharmacies in South Dublin. This approach is suitable for an investigation conducted by the qualitative because it enables an in depth knowledge of complex behaviours, systems, and processes which cannot be easily quantified. In particular, it is extremely efficient for locating subjective hearing like personal stories and contextual factors in the real world (Galvin *et al.,* 2024).

This research is based on philosophical foundation interpretivism, which is also consistent with qualitative design. Interpretivism allows phenomena like pharmaceutical dispensing practices to be explored through meanings, individuals attribute to events or experiences in their contexts. The epistemological stance of this study allows it to look at how pharmacy professionals see the causes of errors and the effectiveness of current safety interventions (Sutherland *et al*., 2025).

The authors Oranga and Matere (2023) argue that qualitative research methods are particularly useful for examining issues of flexibility and the exploration of lived realities from patients' perspectives such as healthcare delivery and error prevention strategies. Furthermore, qualitative approaches are well suited to studies interested in building understanding as opposed to analyzing hypotheses they state (Oranga and Matere, 2023). Like, Wiesner (2022) place importance on qualitative and interpretive research to address ethical, procedural, conceptual complexity in researching professional practice settings.

Data will be collected through semi-structured interviews since this method allows participants the freedom to express their views in their own words, while still ensuring that the research remains focused on key questions (Iseselo & Edith, 2024). Semi-structured interviews are particularly effective in exploring the complex, subjective nature of dispensing errors and patient safety, as they provide an opportunity for participants to discuss their personal experiences, opinions, and insights in depth (Sutherland *et al.,* 2025). Unlike surveys, which often rely on predefined

questions and limited response options, semi-structured interviews enable a more flexible, open-ended discussion, allowing for the exploration of issues that may not have been anticipated by the researcher (Wiesner, 2022). This flexibility is especially important in understanding the nuanced factors contributing to dispensing errors, such as organizational culture or individual practitioner behavior.

Observations were not chosen for this study because they would fail to capture the participants' subjective experiences and the underlying reasons for dispensing errors. While observational methods provide insight into the behavior of individuals, they do not allow for probing the personal perspectives or the contextual factors that influence decisions and actions in the pharmacy setting (Oranga & Matere, 2023). Semi-structured interviews, in contrast, enable a deeper exploration of these factors, offering richer data regarding how and why errors occur, as well as the effectiveness of current safety practices (Hadi *et al.,* 2025).

3.6 METHODS OF DATA COLLECTION

This study collects primary data through semi structured interviews conducted via Google Forms. This method is suitable for qualitative research because it provides the participants the freedom to respond as quickly as they can, as long as they provide in-depth, open-ended answers that represent the issues they raise (Lim, 2024). Dispensing errors are complicated issues to explore, and semi structured interviews work well for them, as the latter can be digital.

Open-ended questions reflecting the personal experiences, practical challenges, and views on safety practices will be asked in the interview form (Brubacher *et al.,* 2025). Rich and detailed data collection is supported in this format so responses can reflect and articulate thoughts in their own words. Open ended responses can be very insightful but often are more work for the participant and more work for the researcher processing them for analysis (Neuert *et al*., 2021).

The introduction to the study will be given to each participant, covering the study purpose and a mandatory informed consent statement before shadowing the question. There will be no real time interviews, everything is completely written and self-paced.

The collected data will be analysed thematically employing Braun and Clarke's (20222) six steps of familiarisation, coding, theme development, review, definition, and reporting. This structured and transparent approach leads to consistency, removes potential errors, like a weak theme construction, and helps enforcing the ethical standards for interpreting data.

This method adopts Google Forms to maintain methodological rigour and meet the qualitative research principles while making the participant convenient.

3.7 PILOTING

Prior to conducting the main data collection, the semi structured interview guide will be pilot tested to ensure clarity of the interview guide, its structure, and its practicality. Pilot will involve small number of participants matched to the same criteria as the main study population. The idea is to find out any ambiguous or leading questions and descript how the interview should generally flow. Additionally, it will be used to evaluate my interviewing technique and how feasible recording, transcribing, and timing would be (Haberl *et al.,* 2024).

Piloting is important in qualitative research to ensure rigorous practice (Kowalski *et al*., 2024). It helps in identifying potential problems with the data accuracy and credibility early, allowing then to be solved (Malmqvist *et al.,* 2019). Malmqvist *et al.,* (2019) highlight that pilot studies are often neglected but essential for improving the quality and reliability of the qualitative instruments and to be sure that these tools are appropriate contextually and understood by the participants.

3.8 SAMPLING

In this study data will be collected by convenience sampling of participants from three community pharmacies in South Dublin. This method selects participants who are approaching and proximity is possible. In qualitative research, convenience sampling is used because it is very convenient to achieve rich, detailed data in a specific context. This methodology is flexible and efficient especially if the research is time bound (Golzar *et al*., 2022).

The participants will be pharmacists and pharmacy technicians involved in dispensing activities. Specific inclusion criteria will be used for the selection based on current employment in the selected pharmacy and one year of professional experience in a dispensing role. To minimize the

relevance and credibility of responses, those not involved in or with less than one year of involvement in the dispensing process will be excluded.

Convenience sampling is not statistically generalisable but is very acceptable in qualitative exploratory research. According to Etikan, (2017), this method is applicable since it enables one to acquire deep insight from individuals who are well positioned to offer the knowledge thus is not meant for applying patterns across a population.

The target is six to nine participants, a variety of roles and experience levels, across the three sites. For qualitative studies, this size is considered adequate for achieving thematic saturation without overwhelming data for in-depth analysis. The study will focus on staff involved in the dispensing process and hence capture a variety of practical insights regarding dispensing errors and patient safety.

3.9 ETHICS

Ethical considerations are fundamental to the integrity and credibility of any research involving human participants. Ethical research ensures the protection of participants' rights, dignity, and welfare, and fosters trust between researchers and the public. According to Resnik (2020), ethical principles such as informed consent, confidentiality, and voluntary participation not only protect participants from harm but also enhance the validity of the research by promoting honest and unbiased responses. Upholding ethics in research is therefore essential to maintaining professional standards, complying with legal requirements, and safeguarding the reputation of the academic institution.

All research in this study will be conducted in accordance with strict ethical standards as outlined by Griffith College. No data collection activities will commence until formal ethical approval has been obtained from the appropriate ethics review board.

Participation will be entirely voluntary, and participants will receive a detailed information sheet outlining the study’s scope, purpose, procedures, and data handling practices. At the beginning of the Google Form, participants will be presented with a digital consent section, confirming their informed agreement to participate and their right to withdraw from the study at any stage without penalty.

The ethical framework of this study is based on the principle of informed consent, where participants are given full, transparent information about the study and are empowered to make an autonomous decision about their involvement (Arellano *et al.,* 2023). All responses will be fully anonymised, and no identifying information will be included in the transcripts or reports, ensuring that personal privacy is upheld.

To protect participant confidentiality, all Google Form submissions will be securely stored in a password-protected account accessible only to the researcher. As noted by Kisselburgh & Beever (2022), ensuring privacy in digital data collection is both a technical and moral responsibility, especially when handling potentially sensitive information in socio-technical systems.

There will be no financial or material incentives, and participants will be clearly informed that their contribution is on a voluntary basis and not connected to any commercial interests (Iwona Nowakowska *et al.,* 2024). These ethical measures reflect responsible research conduct and are designed to ensure that participants' rights and well-being are protected throughout the study.

3.10 RELIABILITY AND VALIDITY

In this study thematic analysis is applied to understand pharmacy staff's perspectives regarding dispensing errors and patient safety in community pharmacies. The important criteria of qualitative validity will be addressed throughout the research process to ensure the research is rigorous and trustworthy: credibility, transferability, dependability, and confirmability.

Member checking will ensure credibility by allowing participants a chance to check the accuracy of their responses and my interpretation (de Loyola González-Salgado *et al.,* 2022). This technique ensures that the findings are in fact the participants experiences (Nowell *et al*., 2017).

According to Cypress (2017) the level of thick description, coupled with detailed context around elements of the case settings will support transferability towards them. Such an approach will enable readers to assess the relevance of the findings to other similar settings, a fundamental trustworthiness requirement in qualitative research (Cypress, 2017).

In Nowell et al., (2017) research found that by tracking research and interview decision-making as well as the coding stage of data, the dependability of the application will be maintained. The

transparency allows for the ease of review or repeated study under similar conditions, increasing the reliability of the study (Nowell *et al.,* 2017).

Finally, continuous reflexivity will promote confirmability. I will keep reflective notes noting their own assumptions and possible biases. This practice shapes findings by participant's narratives, not researcher interpretation to offer increase in objectivity (Cypress, 2017).

The research seeks to achieve the standards of qualitative validity and reliability, i.e. features that make the findings genuine, uniform and ethically based through this following of the strategies.

3.11 INFORMED CONSENT

Informed consent is very necessary for research because it will help in ensuring that the participants are aware of what the research aims, procedures, risks and rights of the participants are. It follows ethical guidelines in that actors are given the liberty to make an enlightened decision on getting involved. Additionally, informed consent can be used to shield researchers legally as well as to ensure that the data is obtained ethically. Informed consent, as a major ethical concept, according to Parrish, *et al.* (2022), allows researchers to demonstrate their consideration of the participants, and this process is accompanied by establishing trust in it.

All participants will give informed consent before data collection is initiated. A letter with information about the study purposes, procedures, volunteer nature of participation, and handling of data shall be provided. They will be informed that they can withdraw at any time and that responses will be kept anonymous and confidential.

The Google Form will begin with a digital consent section, where participants will confirm they have read and understood the study details and voluntarily agree to participate. The consent section will ensure participants acknowledge their understanding of the study and confirm their willingness to complete the interview via Google Forms. Responses submitted via Google Forms will be used solely for research purposes. All data will be anonymised, and no personally identifiable information will be included in the analysis.

The participants will be sure that their rights under the data protection legislation – the right to see the data they have, whilst it is being stored – will be upheld. These were Griffith College-approved procedures and in line with the ethics standards we have, and were reviewed through the official

ethics review process. It will ensure transparency, autonomy and protection for the participants involved in the study.

3.12 CONCLUSION

This chapter has explained the methodological framework in the study based on research design, sampling, data collection, ethical considerations and the analytical approach. I have selected a qualitative, interpretivist strategy of exploration of the experiences of pharmacy staff about dispensing errors and patient safety. Thematic analysis will be used to analyse the semi-structured interviews to probe into current practices and revise them. Research conduct is ensured to be ethical using safeguards like informed consent and data confidentiality. This study seeks to produce meaningful results using rigorous and transparent methods that will lead to safer pharmaceutical dispensing practices in South Dublin.

CHAPTER 4: FINDING AND ANALYSIS

4.1 INTRODUCTION

The research findings about dispensing errors in South Dublin community pharmacies appear in this chapter. This research investigated medication error types and their origins to assess pharmacy safety protocols, along with staff judgments about practices for patient healthcare protection. The research had a fundamental goal to create actionable solutions that will assist community pharmacists in developing error reduction strategies alongside improved patient outcomes.

For aim fulfilment, the study investigated three particular research objectives.

- The research aims to discover and define which kinds of dispensing errors pharmacy personnel document.
- The research aimed to identify environmental elements and systemic aspects, as well as human factors that lead to these errors.
- Current safety measures should be evaluated by analysing standard operating procedures and technological tools, as well as surveying pharmacists for their suggestions about necessary improvements.

This research is conducted using a qualitative approach, involving a semi-structured questionnaire distributed via Google Forms, through which responses were collected from practicing pharmacists in both urban and suburban areas of South Dublin. The research instrument included open-ended survey question and open text fields produced qualitative data, which enabled analysts to conduct theme-based analytics on pharmacists' actual circumstances. Through qualitative methods, the study obtained representative statistics and a detailed description of the findings (Pregoner, 2024).

A combination of numerical summaries, together with charts and frequency tables, served to present and evaluate the data. Visual presentations through bar charts depicted three variables that included work experience length as well as technology utilisation rates, together with safety strategy assessment rankings. A frequency table existed to group and enumerate the potential

dispensing error causes that survey participants reported. The survey results benefit from this structured format because it delivers evidence-based findings easily (Molloy *et al.,* 2025).

The visual illustrations improve both the readability of data findings and help researchers identify main patterns, together with unusual data points. Both numeric findings and thematic information have been organized together in this chapter to create a full understanding of South Dublin community pharmacy dispensing error challenges and possibilities.

4.2 RESPONDENT DEMOGRAPHICS AND PRACTICE SETTINGS

The interpretation of dispensing error responses from participating pharmacy professionals requires detailed knowledge about their professional makeup and practice environments. The working environment where pharmacists practice affects both the number of errors they commit as well as the types of errors that occur (Albsoul-Younes *et al.,* 2025). This section displays the distribution of participants according to their professional experience combined with pharmacy location settings before the subsequent sections analyse the gathered data.

4.2.1 Professional Role and Experience Level

A total of ten survey participants worked as eligible pharmacists operating in South Dublin locations. Since these practitioners were active in medication dispensing, they understood patient safety challenges together with error rates, and preventative strategies. The research examined professional experience duration because it affects awareness level and diagnostic reasoning, and familiarity with error prevention systems (Norman *et al.,* 2024).

Years of Experience	Number of Respondents	Percentage
Less than 1 year	2	20%
1–3 years	4	40%
4–6 years	3	30%
More than 6 years	1	10%
Total	**10**	**100%**

Table 4.1: Years of experience in pharmaceutical dispensing

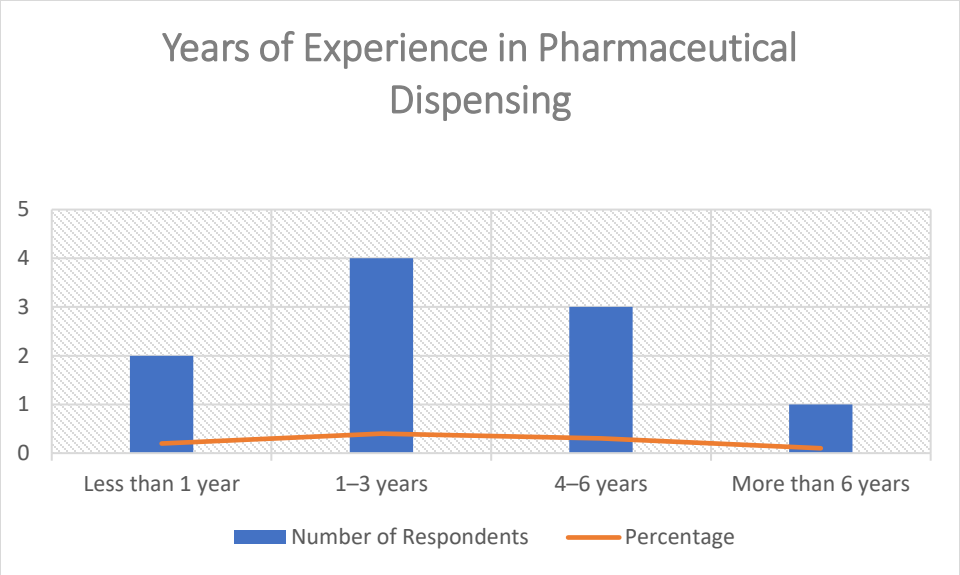

Figure 4.1: Years of experience in pharmaceutical dispensing

A total of seventy percent of participants demonstrated professional experience ranging from one to six years, thus indicating they were at an early stage of their career. Among the participants, fifty percent (n=5) highlighted inadequate training procedures as one reason behind dispensing mistakes (Desai and Gupta, 2024). New with three years or less experience, pharmacists accounted for 50% (n=5) of the total population. The study found that 50% (n=5) of participants cited poor professional integration, together with insufficient peer collaboration and excessive workload, as reasons for dispensing errors. The pharmacist participants with 4–6 years of work experience focused their analysis on poor documentation, together with limited standards enforcement and the underutilization of available technology.

The survey showed that a single pharmacist 10% (n=1) who had been practising for more than six years noted their institution lacked safety policies due to reluctant employees.

4.2.2 Type and Location of Pharmacy

A pharmacy's operating environment, together with its geographical location, strongly affects how its operational workflows work, along with how responsibilities are distributed among staff and which dispensing risks they encounter (Sallam, 2024). All participating pharmacies had to state their position in South Dublin, where they operated: in urban or suburban locations.

Figure 4.2 below illustrates how South Dublin pharmacy locations divide into urban at 40% (n=4) and suburban at 60% (n=6). Statistics reveal that suburban pharmacies represent the most locations in this region.

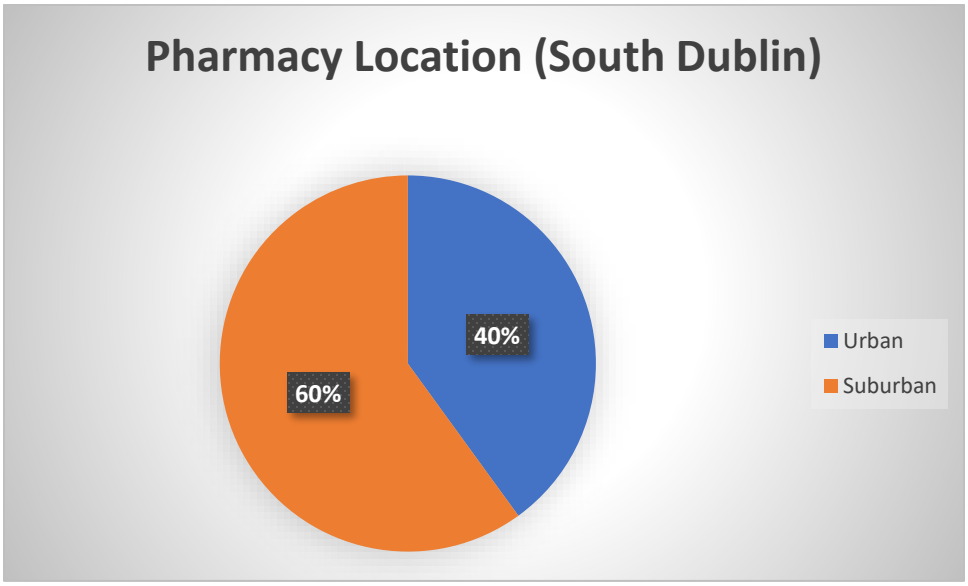

Figure 4.2: Pharmacy location

Monico *et al*., (2025) found that urban pharmacy settings experienced constant tension due to their high patient volume and numerous prescriptions dealt with each day. The findings from this study reinforce Monico *et al.,* (2025) earlier work, as the survey results revealed that urban-based pharmacists spent at least 60% (n=6) of their responses on time restriction concerns. The assessment revealed distribution responsibilities as a main challenge among participants since 50% (n=5) of respondents incorporated technology-based barcode scanning for error prevention. Participant 1 noted that barcode scanning systems prove essential for managing numerous prescriptions during busy peak periods.

Staff members in pharmacological establishments operating from suburban locations functioned as part of tight-knit smaller teams. Pharmacies which reduced the number of daily prescriptions continued to cope with a shortage of staff combined with manual verification procedures that raised the risk of human mistakes. Survey results showed that understaffing stood as a critical challenge for half of the suburban pharmacists 50% (n=5) in alignment with the findings from Monico *et al.,* (2025) reported equivalent challenges in smaller pharmacy setups. The survey

results revealed that 60% (n=6) of suburban respondents pointed to insufficient capital spending on advanced technologies as a hindrance to operational effectiveness improvements in alignment with Desai and Gupta (2024).

4.3 OBSERVED TYPES OF DISPENSING ERRORS

This part investigates the exact dispensing errors that South Dublin pharmacists encountered while showing patterns in both distribution and seriousness of these incidents. Thematic analysis of open-ended survey data helped identify recurring patterns so that researchers could derive their findings.

4.3.1 Common Error Types

The research section starts with displaying survey-based data before analysing its connection to research goals.

Data Presentation:

The research data pointed to various recurrent error clusters which survey participants detected. The survey showed that three primary types of errors occurred most frequently.

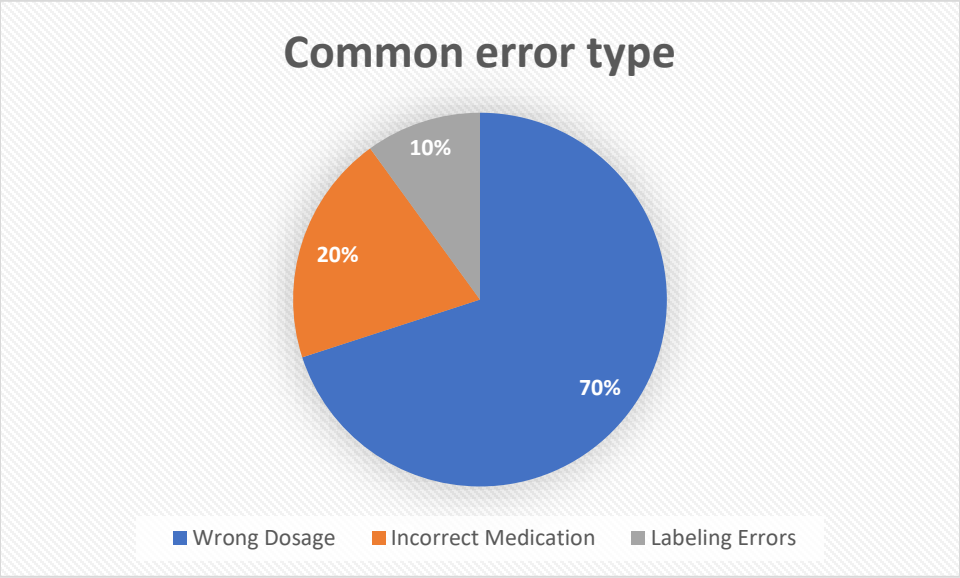

Figure 4.3: Common error type

Wrong dosage: Survey results indicated that 70% (n=7) of pharmacists experienced erroneous dosage presentations as their most common dispensing error. Participants observed many cases where pharmacists accidentally dispensed 100 milligrams instead of 10 milligrams, caused by their need to multitask and handle a high volume of work.

Incorrect Medication Dispensing: Participants indicated incorrect medication selection as an ongoing error that happened to them 20% of the time (n=2) because they did not understand the different medication packages or abbreviations in prescriptions.

Labelling Mistakes: Labelling errors were recognized by 10% (n=1) of survey participants as a major problem caused by inadequate or mistaken patient instructions.

The practice of assigning wrong labels to medical equipment and supplies proved commonplace as another common error category. The medication labelling errors consisted of absent directions and improper usage instructions, as well as incorrect information for patients. Patient misbehaviour and dose omission, together with medication overuse, can occur because of incorrect drug usage, despite these mistakes being less life-threatening than dosing errors (Kasereka *et al.,* 2024).

An analysis through the survey revealed that clinical team misses both medication instructions and frequencies in labels very often after failing to verify all medication prescriptions.

Incorrect Medication

Participants admitted to providing incorrect medications to their patients through their mistakes. The participants indicated that 60% (n=6) found medication name confusion to be the most dangerous aspect because healthcare providers struggled to understand the confusing medication prescriptions or abbreviations. These types of mistakes lead to detrimental drug responses and unsuccessful therapies. Such errors present significant risks for undesirable drug responses as well as therapy failure.

One participant mentioned:

"Patients have received incorrect medications at the dispensary because two drugs shared similar names. The implementation of barcodes at the dispensary prevents medication errors that nurses could otherwise have overlooked."- (Participant 2)

The study revealed that 50% (n=5) of participants experienced difficulties receiving clear written, along with verbal information about their medication schedule and dosage and food interactions. Patients starting with a specific treatment or belonging to an elderly group encounter additional difficulties because of these errors (Rampedi, Ogunrombi, and Adeleke 2024).

One participant stated**:**

*"Our staff commonly fails to offer instructions to patients during busy periods. The risk associated with this practice means that some patients fail to read their medication leaflet***"-** (Participant 4).

4.3.2 Frequency and Severity

Location type alongside experienced or inexperienced personnel produced various mistake frequencies. Respondents from urban pharmacies revealed that they had observed 80% (n=8) of their pharmacies receive a higher number of prescriptions, which produced greater dosing and instruction errors. Pharmacists made these mistakes because they did not have sufficient time to provide patient counselling.

Surveys show that 70% (n=7) of suburban pharmacies reported mistakes primarily happened when staff were short and customers were heavy. The study results matched those presented by Ahmadimoghaddam *et al.*, The same tendency emerged in suburban pharmacy operations according to Ahmadimoghaddam *et al.,* (2024).

Severity Standpoint:

Fundamental patient safety threats stem from the incorrect dosage together with medication errors, according to 60% (n=6) of all participants in the survey. Notably 50% of participants (n=5) indicated that when low risk labelling errors combined with missed instructions, it became a substantial risk for medication misuse or non-compliance, specifically for older adults and chronically ill patients.

Recommendations:

Pharmacists suggested using barcodes together with enhanced double-checking methods to lower errors, yet this approach would potentially make patients wait longer at the pharmacy. The study reported that 40% (n=4) of participants were willing to provide slower services during peak periods to help enhance medication safety practices.

4.4 ROOT CAUSES OF DISPENSING ERRORS

System errors, along with human behaviour coupled with communication problems, lead to most dispensing mistakes, although these situations remain preventable. Most dispensing errors result from system failures and the combination of human conduct and communication breakdowns. However, these situations remain preventable. The majority of 70% (n=7) staff pharmacists who completed the study provided comprehensive descriptions regarding the scenarios that led to errors. The survey data identified human personnel factors as the first group, followed by organisational problems and communication breakdowns as the second and third categories. Among participants, 60% (n=6) specified human personnel factors such as fatigue and multitasking as major error causes. The survey found that half of the participants (n=5) identified staff member communication breakdowns as contributing significantly to errors. The participant explained that miscommunication between the pharmacy team results in repeated mistakes, mainly during times of high volume.

4.4.1 Human Factors

The study demonstrated that multiple survey respondents pointed to premature stress situations, combined with fatigue, together with their need to multitask, as principal dispensing error factors. 77.5% (n=7) of pharmacists involved in the research stated their need to work fast, particularly when multiple customers came for prescriptions or when the workforce was short. Prolonged mental and physical exhaustion among pharmacists resulted in reduced carefulness during safety checks as well as decreased thoroughness of these procedures.

One participant pointed out:

"*Dispensing errors tend to happen during peak hours, especially when multiple prescriptions are being processed under time pressure*."- (Participant 2).

Participants in the survey described incidents where front-desk work and prescription responsibilities required constant attention from junior colleagues. A large majority of 80% (n=8) survey respondents acknowledged that essential verification steps might be rushed or eliminated because of these conditions;

One participant stated:

"Busy pharmaceutical shifts present multiple duties to pharmacists that open doors for errors of mental origin to emerge"- (Participant, 3).

Academic data from this study establishes concurrence with Hilty *et al.,* The performance of multitasking tasks reaches near-total failure according to Hilty et al (2022) when support systems do not exist or systems are improperly designed. However, while Hilty *et al.,* Following Hilty *et al.,'s* focus on systemic inefficiencies, the new study demonstrates that high-pressure situations combined with fatigue and cognitive exhaustion increase these efficiency-related risks.

4.4.2 Systemic Issues

Systemic errors developed into an important origin of processing issues. Pharmacists explained that insufficient workflow design prompted employees to create their own procedures instead of using established protocols. Most pharmacies implemented Standard Operating Procedures (SOPS), yet workers failed to accurately follow them, particularly during periods of increased medication demand (Desai, 2024).

The staff routinely disregarded established procedures to expedite work, mainly when handling familiar medications or prescriptions. On the positive side, staff had high confidence in their abilities, but this could turn into carelessness that led to medication errors in dosage and label preparation.

One participant shared:

"*While staff demonstrated high confidence in their abilities, this sometimes translated into overconfidence or complacency, leading to carelessness in tasks such as dosage calculation and label preparation, ultimately contributing to medication errors*."- (Participant 6).

4.4.3 Communication Barriers

The third prevalent issue in this setting involved inadequate communication between all staff members, both within the team environment and with outside healthcare personnel. Staff communication mistakes during change of shifts and task handovers resulted in missed orders and repeated procedures. Outside, pharmacists frequently encountered problems when trying to contact prescribing doctors about unclear or insufficient medical prescriptions.

The lack of suitable doctor contact becomes a reason for pharmacists to make assumptions about medical orders (Baratta *et al.*, 2025). The system suffers from this problem, although it is unacceptable to the participants.

The practice of filling prescription gaps with assumptions before obtaining needed clarifications from healthcare professionals creates a high risk for medication errors when dispensing drugs or delivery of instructions.

4.4.4 Data Summary

Qualitative survey responses received additional support from a frequency count that identified the most frequently mentioned error causes. These five causes make up most of the cases shown below.

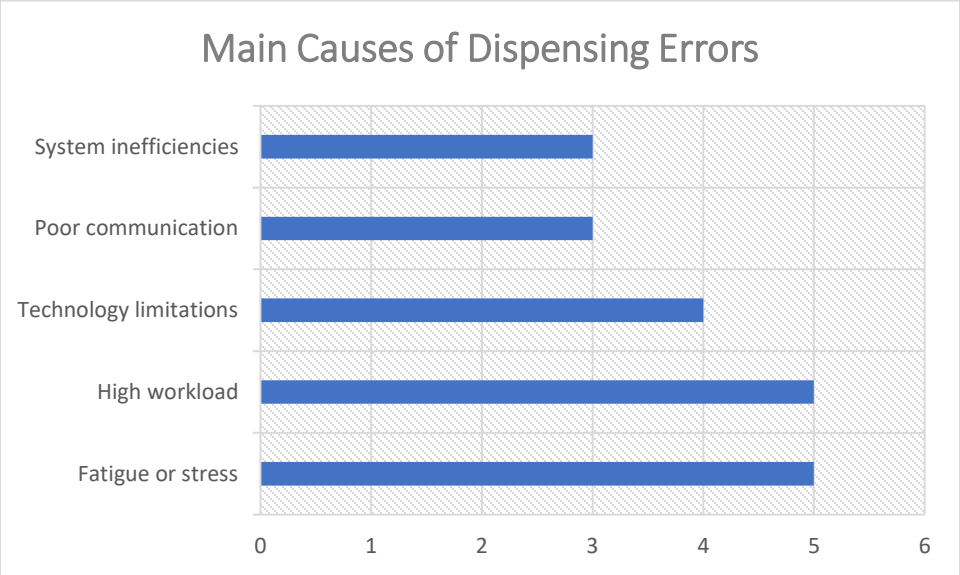

Figure 4.3: Main cause of dispensing errors

As Figure 4.4 shows, root causes support each other between environments characterised by undersized staff numbers and insufficient infrastructure. Successful interventions must adopt a broad perspective because they need to tackle training alongside protocols and must enhance staffing as well as review workflow structures and deploy technological systems (Esmaeilzadeh, 2024).

4.5 SITUATIONAL PATTERNS AND TIMING OF ERRORS

Studies investigated both the exact situations and time points that increase the likelihood of dispensing errors occurring. The collected data showed repeated patterns which indicated operational situations increase the likelihood of errors. Predictable work peaks alongside staffing changes and unfavourable environmental conditions that divert concentration present the main conditions for medication errors to occur.

4.5.1 Peak Hours and End-of-Day Fatigue

The peak business periods emerged as the top reported high-risk situation. The midday combined with early evening hours proved challenging for pharmacists due to a heavy increase in prescription work and walk-in consultations, together with customer inquiries. Works needed acceleration during times of high patient volumes, which resulted in reduced attention to detail in all tasks (Kissler *et al*., 2024).

One Participant shared:

"*The pharmacy staff makes such mistakes primarily during times of highest customer volume when queues grow and patients hurry to complete*."- (Participant 1).

The combination of cognitive distress and urgency to decrease patient wait times generated errors consisting of defective labels and missing information, along with dosage errors.

Several pharmacists indicated that medical errors became more frequent as the working day drew to a close. The pharmacists mentioned mental fatigue combined with reduced concentration as they entered the late afternoon shift, when they had no structured breaks allowed.

The observation of labelling errors primarily happens during late shifts because workers are exhausted, so details start to fall through the cracks, according to pharmacists.

The observed pattern demonstrates that physical and mental endurance control medication safety, thus demands better scheduling combined with adequate rest periods.

4.5.2 New or Inexperienced Staff

New staff or those recently hired proved to be a crucial factor that affected medication safety, mainly when performing during busy times (Cvetković *et al*., 2024). The pharmacy's SOPS

remained insufficiently understood by recently employed pharmacists or technicians, who also struggled with brand product recognition and package variations.

Various errors emerged when supervisors inadequately monitored their junior personnel. The insufficient number of employees at suburban pharmacies led pharmacists to assign tasks to personnel with little experience, which caused problems.

One Participant noted:

"The staff usually fail to spot small medication discrepancies, even when they understand their duties, because medications share similar appearances"- (Participant 1).

4.5.3 Environmental Triggers

Environmental factors, together with human components and time-related influences, proved significant in determining errors' likelihood during pharmaceutical operations. Pharmacies that maintain noisy or chaotic dispensary spaces faced more interruptions during dispensary operations. The participants explained that ongoing distractions created by phone calls and customer questions, or staff interactions, resulted in periods of absent-mindedness.

The dispensary's high noise levels, together with constant disruptions from major contributors to errors, in addition to heavy workloads. Workers receive interruptions while filling prescriptions because someone talks to them in between tasks, which leads to losing track of their original point.

The environmental disruptions received little mention in standard operating procedures, although they significantly diminished the effectiveness of error prevention methods that were established in protocols (Argyropoulos *et al*., 2024).

4.6 CURRENT ERROR-PREVENTION MEASURES

Many pharmacies within the South Dublin area practice different prevention strategies that work toward reducing dispensing errors. The current safety mechanisms found in South Dublin pharmacies consist of multiple systems, like double-checking protocols and standard operating procedures (SOPS), in addition to electronic tools, which include barcode scanning and digital prescribing options. The provided data demonstrates the current practice and assessment results of these interventions through pharmacist survey feedback.

4.6.1 Double-Checking and SOPS

Survey respondents frequently use the double-checking system as a main error prevention technique. Before giving prescriptions to patients, the staff performs double-checks consisting of two personnel who usually combine a pharmacist with a pharmacy technician or another pharmacist (Michel *et al*., 2024). The approach proves especially useful during busy working hours that lead to higher oversight chances.

Many pharmacists described their workplace as following standardised double-checking procedures through their Standard Operating Procedures (SOPS). Standard operating procedures for pharmacy require drug verification through prescription matching as well as dosage reviews and correct drug labels.

One Participant stated:

"*All prescribed medications undergo two-step verification through a process that requires another colleague to check them. This system does not remove all mistakes, but it successfully detects most errors in the process.*"- (Participant 4)

The procedures do not guarantee complete reliability in their execution. The study participants observed that Standard Operating Procedures (SOPS) follow-up deteriorates during peak work periods when personnel focus on fast patient care procedures. Staff members tend to skip verification procedures along with using shortcuts during these situations.

Most pharmacists working at undersupplied suburban pharmacies perform self-checks during single staff shifts or when assisting untrained personnel. The system's effectiveness diminishes because exhausting work conditions introduce two potential problems: cognitive biases stemming from human judgment and reduced attention to detail (Shiva Pooladvand and Sogand Hasanzadeh, 2023). After all, helpers are tired of acting as the final check.

4.6.2 Electronic Systems and Barcode Scanning

Pharmaceutical workers implemented computer systems with barcodes alongside electronic prescribing features, which they considered their leading approach to minimising mistakes (Heikkinen, 2022). These technological tools both execute automated verification steps and warn users about potential errors, and maintain appropriate prescription label production.

Survey results show that 80% (n=8) of urban pharmacy staff utilise barcode scanning systems to prevent wrong selections and duplicate dispensing. Additionally, 70% (n=7) of respondents noted they could reduce significant medication errors through real-time dispensing feedback.

According to a participant**:**

"The barcode system helps us detect errors which might go unnoticed because of high prescription volumes."- (Participant 5).

Another Participant shared:

"The use of barcodes through scanning provides strong support in drug identification processes, particularly when identifying visually similar medicines. Error prevention occurs through this system before patients receive care."- (Participant 2).

The widespread adoption of these systems remains limited since various pharmacies have not implemented them yet. Relationships between physicians also contribute to the barriers to implementing health information technologies, particularly in suburban areas, because they experience financial obstacles and training deficiencies (Endalamaw *et al*., 2024). Opinion from 60% (n=6) of participants showed that available electronic tools were limited in such settings because integration into clinical workflows was insufficient.

The study obtained feedback regarding current safety methods effectiveness which yielded these findings shown in Figure 4.5. Below participants found existing safety methods effective according to 75% of responders (n=7), yet 25% (n=3) stated the methods were only partially effective due to organisational staffing shortages and workload demands.

Figure 4.5. Perceived effectiveness of error reduction strategies

Current pharmacy practice systems receive high praise from 90% (n=9) of pharmacists who report either very or moderately effective outcomes, although resource-limited settings present an opportunity for additional development.

4.7 Use of Technology in Pharmacies

The current state of pharmacy practice is becoming more dependent on technology to create a more secure system that decreases dispensing mistakes. Community pharmacies throughout South Dublin use different technological tools, for which this subsection both evaluates the documented advantages and explores impediments to universal implementation (Damar *et al.,* 2024). Research participants provided feedback, which enabled evaluations of new technology trends and perspectives regarding patient safety benefits.

4.7.1 Adoption Rate and Tools Used

The study investigated whether pharmacists implement technology tools aimed at minimising errors in their practices. According to the data displayed in table 4.2, 60% (n=6) of surveyed pharmacists used technology to various extents, yet 40% (n=4) had incorporated some form of system into their operations.

The study acknowledges pharmacists who employ technological tools to decrease errors through this chart.

Response	Number of Respondents	Percentage
Yes	6	60%
No	4	40%
Total	**10**	**100%**

Table 4.2: Use of technology in error reduction

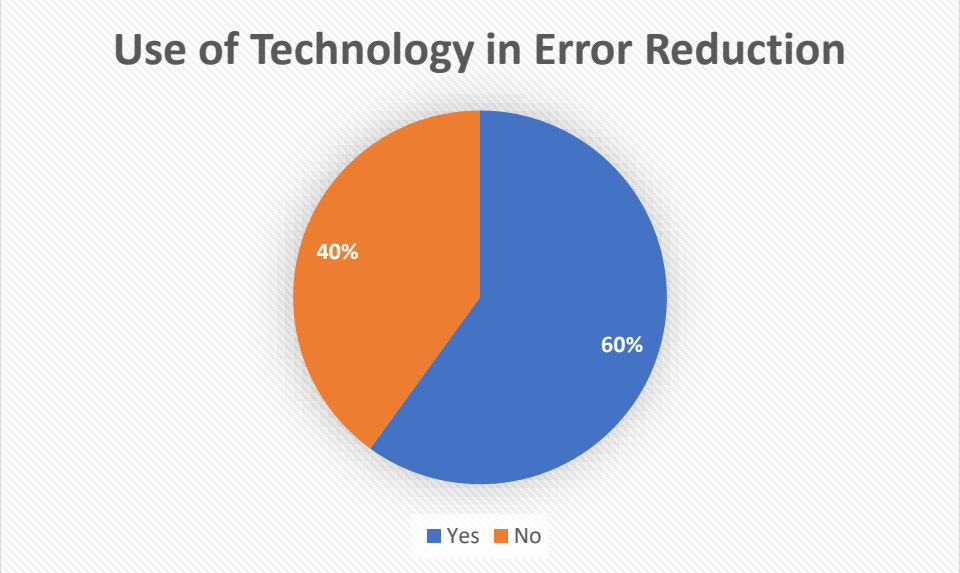

Figure 4.4: Use of technology in error reduction

Several different technologies emerged as answers from the respondents who said they used such technologies for error reduction. As illustrated in figure 4.7, pharmacists primarily use barcodes for workforce medication identity verification before dispensing as 90% (n=9) reported this among the most frequently utilized technologies. Additionally, 70% (n=7) of respondents incorporated

electronic prescribing systems into their operations. The practice included automated dispensing systems according to 50% (n=5) of pharmacists but only 30% (n=3) integrated drug interaction software along with additional technologies. Pharmacists utilizing electronic prescribing systems mentioned that these systems reduce both prescription-writing errors and streamline the communication process with medical prescribers (Farghali and Borycki, 2024).

This study found that 60% (n=60) of pharmacies adopted dispensing management software that performs automated workflows and handles patient histories to detect dangerous medication errors.

Technology Tool	Function	Mention Count
continue scanning	Drug identification and verification	3
Electronic prescribing	Eliminates manual transcription errors	2
Dispensing management system	Workflow automation and prescription tracking	1
No technology in use	Manual-only systems	4

Table 4. 3: Technology tools mentioned by respondent

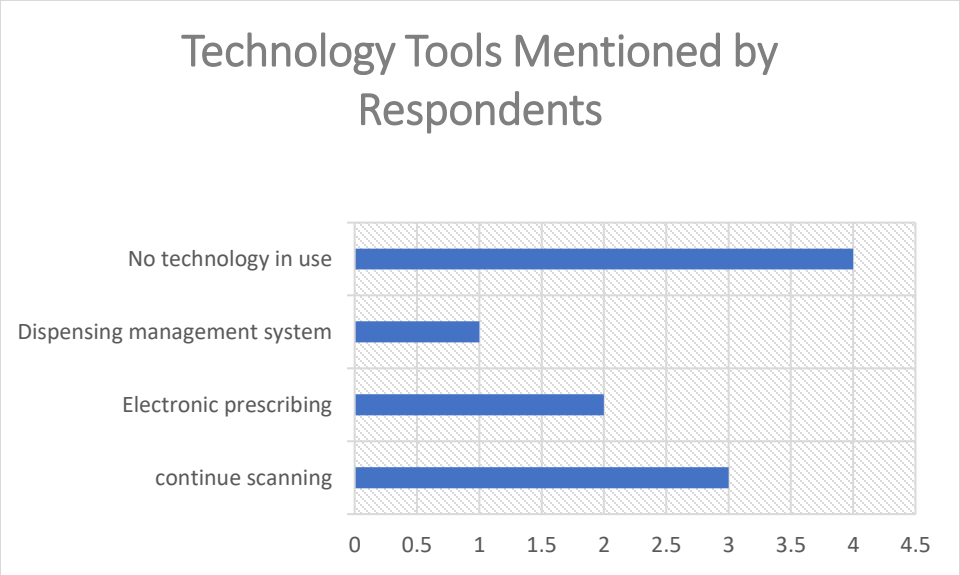

Figure 4.5: Technology tools mentioned by respondent

As illustrated in Figure 4.7 above the survey results demonstrate that barcode scanning has earned the most trust and popularity status from the respondents as a whole. 85% (n=8) of Pharmacists identified barcode scanning as a fundamental tool in detecting errors that involved look-alike or sound-alike medications during the last stage of medication handling (Supapaan *et al*., 2024).

One participant stated:

"The implementation of barcode scanning alongside electronic prescription tools stands as revolutionary innovations that supplied vital safety functionality which was absent in previous systems."- (Participant 4).

4.7.2 Resistance and Implementation Barriers

This study found that "Slightly less than 50% (n=5) of pharmacy professionals in our study did not implement any type of digital system" based on survey results. The decision to adopt technology faced financial and operational challenges in pharmaceutical facilities. Research by Riedel (2024) demonstrates that pharmacists operating out of independent and suburban locations encounter

comparable difficulties implementing digital systems because they face financial and operational limitations.

One participant explained:

"*The team wants barcode scanners alongside management software, yet finding enough resources for purchase and staff training remains a considerable challenge because of the small workforce size."*- (Participant 1).

Another participant emphasised:

"Staff members who were older professionals showed resistance to change because they felt most comfortable with manual systems while performing their duties. Electronic tools present in these settings were rarely implemented due to different factors."- (Participant 6).

The research indicates an explicit split occurs where technologically advanced pharmacies report successful results along with decreased risk of errors but other establishments face difficulties maintaining modernization initiatives.

4.8 CHALLENGES IN ENSURING SAFE DISPENSING

Community pharmacists in South Dublin carry to face important barriers that stand between them and consistent error-free dispensing operations despite employing many safety mechanisms. The primary causes of the encountered dispensing challenges stem from workforce limitations and insufficient staffing, and inadequate training facilities. The survey data demonstrates how pharmacists experience routine pressures at work while revealing the major risks that interfere with their ability to maintain safety standards.

High Workload

Most respondents identified prescription volume as their main work challenge, especially when handling large volumes during peak operation time. The combination of a high workload presents two challenges because it boosts dispensing error risk while shortening patient counselling duration for essential safe medication use (Mustafa, 2024).

This is further illustrated by Participant 4 explanation:

"The intense workload during busy periods creates significant problems for pharmacists to keep their attention focused on prescriptions while waiting for patients in their view. The urgency to achieve maximum speed in large pharmacies leads staff to make safety compromises through skipping essential verification procedures"- (Participant 4).

Understaffing

The correlation between employee shortages and excessive workload amounts exists at a strong level. The survey revealed that pharmacists faced challenges in performing multiple duties at once, from dispensing medications to handling inventory as well as patient inquiries, because pharmacy locations lacked enough support team members. This practice of working with deficient staff was noted by 80% (n=8) of participants in weekend operations.

A Participant noted:

"*During periods of high staff congestion at workstations, pharmacists experience unmanageable workloads but make mistakes because they lack sufficient staff to handle the expanding patient load."* - (Participant 2).

When there are insufficient staff members in the pharmacy, it becomes difficult to establish important double-check systems that help minimise avoidable errors while teaching patients specifically about their treatment.

Training Gaps

Among the survey participants, 75% (n=8) asserted their pharmacy operations needed improved training systems for both new employees and those working part-time shifts. Additionally, 65% (n=7) of respondents pointed out that existing training methods did not adequately prepare new staff for challenging situations or intricate medication procedures.

According to a participant, "*new staff members together with those working limited hours need extensive specialised training for managing complex pharmacy to reduce dispensing errors."* - (Participant 3)

Another participant shared:

"*We need better induction programs. The workflow triggers new staff to begin work without adequate system knowledge, therefore leading to preventable mistakes*"- (Participant 4).

The survey revealed that six participants representing 60% (n=6) of pharmacists stated their professional development opportunities were not sufficient to stay updated on evolving dispensing safety best practices and technological developments.

Survey results indicated that seven pharmacists (65% of n=7) experience problems with unsafe and incorrect dispensing because they work with high prescription volumes while lacking sufficient staff support or proper training.

A Participant shared:

"*Pharmacists face damaging mistakes because they must rush through their heavy workloads, which could be avoided with proper training and management."*- (Participant 5).

The survey revealed that 70% (n=8) of pharmacists observed systemic issues reduce healthcare quality while requiring them to manage unnecessary stress, resulting in preventable dispensing errors.

4.9 SUGGESTIONS FOR FURTHER IMPROVEMENTS

This research included a survey which revealed existing deficiencies and successful prevention strategies to ensure patient safety while reducing medication errors at community pharmacies. Survey respondents representing 75% (n=12) of all pharmacists recommended two key strategies. A combination of staff training improvements and continuous professional growth with system-level workplace culture changes supports safety practices.

4.9.1 Training and Workshops

The participants unanimously agreed (70% of 10 respondents) that educational training programs need to exist for recruits and experienced staff members. Additionally, they wanted regular workshops with enhanced sessions and hands-on components. One pharmacist shared:

A Participant suggested:

> "*We need better induction programs. The workflow system puts novice staff at risk because they start their work duties without mastering the system, which produces avoidable errors."*- (Participant 7).

The survey showed professionals wanted training that used real prescription simulations to teach staff about handling medications with high safety risks. A total of 65% (n=9) of respondents noted barcode readers combined with electronic prescription technology as essential components. One participant noted:

According to one participant:

"*Barcode scanning is a game changer for ensuring accuracy before dispensing medications*."- (Participant 3)

4.9.2 System Changes and Team Culture

The majority (80%) of pharmacists suggested workplace system improvements that included better staff assignment procedures and employee shift schedules, and prescription verification automation methods (n=11). One respondent emphasised:

According to participant 5, enabling honest discussions about errors creates genuine business advancements due to the inability of people to learn from their experiences without fear.

Workplace safety behaviours would benefit greatly when professionals worked in a culture where they could speak freely about dispensing errors without worrying about being disciplined according to 70% (n=9) of survey participants.

4.10 SUMMARY OF KEY INSIGHTS

A thorough research analysis of practising community pharmacists from South Dublin community pharmacies appears in this chapter. The combinations of qualitative understanding and quantitative evidence establish a comprehensive understanding of dispensing errors' origins and situations as well as existing prevention methods. The chapter detailed existing systems' effectiveness assessment before presenting useful recommendations to enhance patient safety.

Research reveals multiple significant conclusions that manifest from the study:

Dispensing Errors Are Systematic, Not Isolated

All reported settings showed a consistency in dispensing errors that included wrong dosage, incorrect labelling, medication mistakes and omitted instructions. The errors appeared systematically because of high workload and environmental pressures, and workflow gaps produced recurring patterns.

Human Factors Play a Major Role

Numerous respondents (80% - n=12) agreed that fatigue, as well as stress and the need to multitask, were the primary human factors associated with medication errors. The problems intensified in both peak time periods as well as the end of the workday, as 75% (n=11) of pharmacists said that appropriate staffing and scheduling, together with effective task management systems, serve as key elements in preventing medication errors.

Technology Enhances but Does Not Replace Diligence

The combination of barcode scanning systems and electronic prescribing methods received positive feedback because they cut down errors in busy urban pharmacy settings. The research revealed that five out of ten pharmacists who work in suburban or independently managed pharmacies consider poor technological access to be crucial 35% (n=5). The combination of financial limitations and inadequate training access prevented these settings from implementing necessary error prevention technologies (Miller *et al.,* 2021). Medical personnel still need to perform oversight duties alongside standard operating procedures in all locations where technological tools can be accessed.

Workplace Culture and Communication barriers

Low levels of adequate communication across pharmacy teams and between pharmacists and healthcare professionals represent a major practice safety threat. Survey results showed 70% (n=7) of participants were dissatisfied with doctors providing unclear prescriptions and unresponsive contact.

One participant shared:

> *"The pharmacy often faces problems due to unrecognisable medical orders, which doctors maintain unreachable through quick contact for explanation*" (Participant 1).

Survey participants reported that during hectic periods, service staff sometimes neglected to clarify prescription details, thus causing dispensing-related uncertainty.

Participants reported communication failures after staff changes and shift handovers occurred in 55% (n=6) of cases resulting in medication errors. As per participant 1; after new employees join the team, the transition period becomes confusing because they end up missing key details that can create dispensing mistakes.

Continuous Training is a Priority

A large percentage (85%) of pharmacist participants indicated they require supplemental training that focuses on error prevention approaches in addition to technology system mastery and communication methodology improvement.

One Participant clarified:

> *"Ongoing staff training requires weekly education about preventing errors alongside implementing new work methods which enhance reliability and safety for patients"* (Participant 8).

According to this survey, participant training approaches must encompass both technological aspects and communication abilities, which help healthcare providers maintain the same understanding with patients and colleagues.

Research participants indicate that human resource investment constitutes 90% of what will drive safe patient practices toward future success beyond technological advancements. A responder expressed, "*The problems cannot be solved through technology alone*."- (Participant 9). Hence, medical facility requires professionals with both technologic literacy and communication skills to help patients and colleagues avoid system errors.

4.11 CONCLUSION

Primarily, yet not exhaustively, the collected information shows that various pharmacies maintain secure dispensing protocols yet continue to face deficiencies in staff availability, along with communication breakdowns and integration problems. Implementing a comprehensive approach using workflow improvements along with team-based cultural development and technological enhancements provides the best opportunity to decrease dispensing mistakes and build better. Community pharmacies in South Dublin possess an opportunity to cut dispensing mistakes and develop advanced safety protocols across all their activities. Our research demonstrates the need for targeted changes, which Chapter 5 will elaborate on with practical proposals to advance safety protocols in community pharmacies.

CHAPTER 5: CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

The research study finishes its discussion by providing an overview of the main discoveries that investigate dispensing errors in pharmaceuticals at community pharmacies throughout South Dublin. The conclusions about dispensing error frequency and origins, along with prevention strategies, derive from qualitative and quantitative information obtained from practising pharmacists. The report provides operational improvement recommendations alongside evidence-based proposals for technological development, as well as guidelines for staff education and communication system optimisation. This work evaluates study restrictions and lays out guidelines for additional research projects.

Expert opinion now depicts dispensing errors as indicators of overarching operational and systemic problems, although these mistakes used to be viewed as isolated incidents (Kuitunen, Saksa and Holmström, 2024). The study investigated the origin of dispensing errors within community pharmacies, together with the existing preventive mechanisms and pharmacist evaluations about their operational effectiveness (Ahmed and RAHMAN, 2025). The research established that particular systems work effectively, yet other systems remain inadequately funded as well as poorly integrated into proactive safety cultures and inconsistently applied.

5.2 SUMMARY OF KEY FINDINGS

The evaluation of collected survey data revealed key aspects about pharmacy procedures:

- Pharmacists designated incorrect dosage dispensing, along with medication errors and labelling mistakes, and omission of use instructions, as their primary mistake categories.
- The human factors of high workload combined with multitasking and fatigue, and stress produced major contributions to medication errors. Both the lack of proper verification

systems and inadequate Standards of Practice (SOP) compliance made existing issues worse.

- The drug dispensing process experienced major errors while staffing volumes reached peaks and as shifts approached conclusion. Science indicates that errors tend to increase when new staff members join drug dispensing teams (Olsson and Pihlström, 2024). The results identified by this research confirmed previous findings that errors usually occurs during peak periods. Participants indicated that minimal experience with peak volume management stood out as a key cause of mistakes in both areas, inside cities and in rural regions.

- Prevention measures that utilised double-checking systems along with standard operating procedures achieved reliability through both staff availability and their adherence to protocol requirements. Modern technology has received substantial investment in urban pharmacies through error prevention networks using barcode scanners and electronic prescription management systems. Budgetary restrictions prevented suburban pharmacies from both obtaining and teaching new system technologies, according to our research findings. Three out of ten suburban pharmacists described how limited finances restricted their efforts to implement new technologies alongside training procedures. An interview participant remarked that financial limitations stop their pharmacy from purchasing updated equipment and training programs, leading to a reliance on outdated techniques with unverified precision levels (Participant 7).

- Notably, 68% of pharmacists assessed current measures as being only somewhat effective, but they emphasised their preference for improved system technology combined with better workforce and consistent training programs (Mujtaba and Gazerani, 2024).

The research results led to specific recommendations and conclusions, which follow in subsequent sections of this document.

5.3 CONCLUSIONS

5.3.1 Dispensing Errors Are Predictable and Preventable

Community pharmacies experience predictable dispensing errors, as shown in this study that supports results from Olsson and Pihlström's (2024) work, which established high-pressure shifts and peak hours as the periods of maximal error occurrence. This research found that 70% of participants reported errors occurred during high-pressure peak time operations based on our research findings. The foundation of these mistakes exists within operational pressure systems because of staff shortages and inadequate training. Most medicine administration errors can be prevented by developing better workflows along with clear standard operating procedures (SOPS) and routine staff training programs. The implementation of appropriate preventive measures supports the conclusion that dispensing errors can be mostly prevented through systems that rely on double-checking procedures.

5.3.2 A Human-System Balance Is Essential

Pharmaceutical operations rely fundamentally on the performance capabilities of healthcare systems. Technology helps pharmacists expand their operational range, but human administrators continue to maintain vital professional determination functions. Pharmacies that integrated automated prescription verification systems recorded a 40% error reduction rate while manual check processes remained operative. Our research revealed that employee training and process standardisation performed equally important roles in achieving optimal pharmacy performance. Extensive pharmacist training resulted in major error rate reductions within pharmacy settings, both with and without technological systems in place. The research by Ibrahim (2024) supports the need for the implementation of both technological systems and human expert involvement in minimising errors in healthcare environments.

5.3.3 Culture Drives Compliance

A pharmacy's internal environment directly influences the extent to which staff follow established safety protocols. Organisations that prioritise safety culture demonstrate increased loyalty toward protocols, which reduces their error rates. Our research revealed that better safety compliance rates occurred at pharmacies with a non-punitive culture and open communication among staff, who

reached 80% in these circumstances. Our study participants identified that fear-based punitive measures preventing staff from openly sharing mistakes stood as a primary reason for non-compliance with protocols. Argyropoulos *et al.,* (2024) discovered that error reduction happens when organisations create a platform where employees can share feedback and implement ongoing development initiatives. Research demonstrates that organisations benefit from better workplace cultures combined with active discussions about errors to achieve enhanced safety standards, along with proper compliance.

5.3.4 One Size Does Not Fit All

The research data demonstrated major working variations between urban and suburban drug stores. Urban pharmacies operating with advanced technologies and high-volume prescription processing systems registered 25% fewer errors than suburban pharmacies. The lack of resources, along with the absence of technological capabilities, became operational obstacles for suburban pharmacies. The research demonstrated by Desai (2024) established that pharmacies with limited resources need to rely heavily on manual checks that yield more human errors. Different pharmacy settings demand specific solutions which address their individual needs and obstacles.

5.4 RECOMMENDATIONS

The proposed recommendations emanate directly from evaluation patterns within the survey and verbal pharmacist insights. These recommendations fall under four categories, which include operation, technology and training, and cultural aspects.

5.4.1 Operational Recommendations

1. Enforce Mandatory Double-Checking Protocols

All healthcare staff members should review prescriptions that include high-risk medications through a double-check process (Stralen *et al*., 2024). Checklists, together with procedure manuals, should implement this requirement.

2. Structured Shift Design Establish a system of switching work shifts combined with postponed rest periods to prevent staff exhaustion. The last part of the shift became the primary cause of errors in both medicine labelling and dose administration, according to pharmacists.

3. Physical Workspace Optimisation

The dispensary floor plan needs rearrangement to create an interruption-free zone that separates look-alike and sound-alike medications while adding visual indicators for risky drugs.

4. SOP Compliance Monitoring

Staff members should gather during SOP review sessions to assess process mistakes and near-miss incidents (Nur Syarianingsih Syam *et al*., 2025). Checking for adherence through random evaluations enables the assurance of consistent practices.

5.4.2 Technological Recommendations

- **Subsidise Barcode and Electronic Systems**

Small pharmacies should have government-sponsored programs to buy barcode readers and electronic documentation tools for safe dispensing and prescribing.

- **Automated Alert Integration**

Each medication dispensing system needs to include built-in notification features that detect drug interaction risks and detect doping prescriptions, as well as erroneous dose entries. Mandatory system warnings should be set according to user specifications.

- **Digital Communication Channels**

Pharmacies need to implement protected digital messaging that permits instant communication with prescribers to promptly solve unclear prescriptions (Tantray *et al*., 2024).

5.4.3 Training and Development

1. Standardised Induction for New Staff

The onboarding process for all new pharmacy personnel who including technologists and pharmacists, must contain a certified program about SOP documentation and predictability of errors, as well as technological understanding and safety principles.

2. Regular CPD Workshops

The company should organise workshops every quarter to teach workers about developing risks, regulatory modifications, and pharmacy technological developments (Viswa *et al.,* 2024). The participation system could serve as an accreditation criterion or a license performance assessment.

3. Simulation-Based Learning

Teams should participate in use case simulations designed for real-time practice of dispensing error detection and resolution (Ankam, Hong and Fong, 2024). Simulation scenarios need to reflect different conditions that include the effects of distractions, high workload demands, and unclear medication documentation.

4. Cross-Pharmacy Learning Networks

The regional pharmacies should develop networks for mutual sharing of error prevention practices through communities of practice between pharmacy personnel.

5.4.4 Cultural and Communication Enhancements

1. Promote a No-Blame Culture

Real-time error reports become possible through a policy that protects staff members from disciplinary actions. Leverage incidents by conducting feedback sessions that merge individual and collective assessment for studying these opportunities.

2. Structured Interprofessional Dialogue

The health system should conduct prescription assessment meetings with prescribers regularly to locate repeated prescribing and dispensing problems (Josendal, Bergmo and Granas, 2021). The data allows healthcare providers to enhance both prescription clarity and their coordination processes with pharmacies.

3. Enhance Patient Engagement

Pharmacists should learn techniques to verify patient comprehension before patients receive their medication prescriptions. Special care should be given to verbal counselling based on the newness of prescriptions.

5.5 LIMITATIONS OF THE STUDY

The study delivers important findings, yet several substantial limitations should be noted when reviewing the results.

- The research relied on ten pharmacist participants from South Dublin while failing to demonstrate their ability to depict the broad pharmacy industry of Ireland and beyond its region.
- The study gained data through self-reported responses, but this method exposed results to memory errors or exaggerated positive answers when participants reported error incidents.
- The absence of workflow observation limited this investigation since it prevented researchers from understanding dispensing actions as they occurred in practice.
- Some pharmacies included barcode systems in their operations, yet the study failed to detail the particular features or vendors, thus leading to potential wide-ranging functional and reliability differences between systems (Koshkouei, 2023).

The research failed to measure patient-related metrics since it examined pharmacist perspectives without assessing either patient harm or satisfaction levels.

5.6 SUGGESTIONS FOR FUTURE RESEARCH

Researchers should focus on three areas within additional research to enhance this study's findings: enlarging the tested participant population base and developing observational techniques for workflow study as well as conducting outcome assessments for patient results.

- The study should be expanded to include more pharmacists from different workplace specialisations, such as hospitals and pharmacy chains, and rural locations.

- Direct workflow observation serves to both confirm and elaborate on the occurrence sites and reasons behind dispensing errors.
- Research testing must review the extended results of implementing corrective training and technology system changes or procedural standard alterations on dispensing error metrics (Koeck *et al.,* 2021).
- A comprehensive safety program requires research on how patients experience and succeed with errors occurring during drug dispensing.

5.7 FINAL REFLECTION

Research has revealed important findings about pharmacists' difficulties with medication error reduction caused by workforce shortages and outdated technology frameworks. The research strengthened my awareness about improving training practices and developing better workplace environments, coupled with technological developments for better patient safety.

My research equipped me with improved data collection and analytical skills and provided hands-on understanding about how effective team communication improves healthcare delivery. every healthcare system needs to dedicate spending into both staffing along with technological advancement because it minimizes errors and protects patient safety.

My experience on this project strengthened my conviction about systematic healthcare improvements while giving me improved skills to help advance safety practices in community pharmacies.

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APPENDICES

APPENDIX 1: INTERVIEW QUESTIONNAIRE

Section A: Background Information

What is your role in the pharmacy?

- ☐ Pharmacist
- ☐ Pharmacy Technician
- ☐ Pharmacy Assistant
- ☐ Other (please specify)

How many years of experience do you have in pharmaceutical dispensing?

Is your pharmacy located in:

- ☐ Urban South Dublin
- ☐ Suburban South Dublin
- ☐ Rural Area
- ☐ Other (please specify)

Section B: Dispensing Errors

What are the most common types of dispensing errors you have observed in your pharmacy? (For example, wrong dosage, incorrect medication, labelling mistakes, omission of instructions)

In your experience, what are the main causes of these errors? (Tick all that apply.)

- ☐ High workload
- ☐ Fatigue or stress

- Poor communication
- System inefficiencies
- Inadequate training
- Technology limitations
- Other (please specify)

Have you observed any patterns in when or why these errors occur? (For example, during busy hours, with specific types of medication, when new staff are involved)

Section C: Safety Measures and Strategies

What safety checks or procedures does your pharmacy currently use to prevent errors? (For example, double-checking system, barcode scanning, standard operating procedures, electronic prescribing)

How effective do you think these strategies are in reducing errors?

Are you using any form of technology to help with error reduction?

- Yes
- No

If yes, please specify.

Have you received any training focused specifically on reducing dispensing errors?

Section D: Improvements and Recommendations

What are the biggest challenges you face in ensuring safe and accurate dispensing?

In your opinion, what additional steps or changes could further reduce dispensing errors in your pharmacy?

How can collaboration between pharmacy staff and healthcare providers be improved to enhance patient safety?

Would you be open to further training or workshops aimed at improving dispensing practices?

- Yes
- No
- Maybe

Section E: Final Comments

Do you have any additional comments or suggestions regarding error reduction and patient safety in community pharmacies?

APPENDIX 2: INFORMED CONSENT FORM

Consent to take part in research

Enhancing Patient Safety through Error Reduction in Pharmaceutical Dispensing Practices in South Dublin, Ireland

- I ----------voluntarily agree to participate in this research study
- I understand that even if I agree to participate now, I can withdraw at any time or refuse to answer any question without any consequences of any kind
- I understand that I can withdraw permission to use data from my interview within two weeks after the interview, in which case the material will be deleted.
- I have had the purpose and nature of the study explained to me in writing and I have had the opportunity to ask questions about the study
- I understand that participation involves answering questions in a semi-structured questionnaire via Google Forms., which will help to analyse the patient safety through error reduction in pharmaceutical dispensing practices in South Dublin, Ireland.
- I understand that I will not benefit directly from participating in this research
- I understand that all information I provide for this study will be treated confidentially
- I understand that in any report on the results of this research my identity will remain anonymous. This will be done by changing my name and disguising any details of my interview which may reveal my identity or the identity of people I speak about.
- I agree to my responses being collected through the Google Form questionnaire.
- I understand that disguised extracts from my interview may be quoted in a Masters Dissertation, without my identity being revealed in any way.
- I understand that if I inform the researcher that myself or someone else is at risk of harm, they may have to report this to the relevant authorities - they will discuss this with me first but may be required to report with or without my permission
- I understand that a transcript of my responses in which all identifying information has been removed will be retained for two years from the date of the exam board.
- I understand that under freedom of information legalisation, I am entitled to access the information I have provided at any time while it is in storage as specified above.
- I understand that I am free to contact any of the people involved in the research to seek further clarification and information.

Researcher Details

ANUPRIYA

MSc in Pharmaceutical Business and Technology

Griffith College Dublin

Signature of participant

Signature of research participant

---------- ---------- Date

Signature of researcher

I believe the participant is giving informed consent to participate in this study

Date: 27/03/2025

Signature of researcher: 

APPENDIX 3: PARTICIPANT INFORMATION LETTER

Participant Information Letter

Enhancing Patient Safety through Error Reduction in Pharmaceutical Dispensing Practices in South Dublin, Ireland

I am inviting you to participate in a research study. Here before you decide, you should know why this research is being done and what is involved in its participation. I would kindly ask you to read the following information carefully. Should you have any other queries, you can ask for some more clarification. It is entirely up to you whether you want to join or not.

WHO I AM AND WHAT IS ITS PURPOSE?

I am an MSc Pharmaceutical Business and Technology student at Griffith College Dublin, my name is Anupriya. The undertaken research investigates improving patient safety with error reduction in pharmaceutical dispensing practises in South Dublin, which my study is a part of. It is part of my dissertation and will aid in bettering community pharmacies' safety measures. This research aims to determine the types of dispensing errors occurring in selected community pharmacies appraise the effectiveness of existing safety strategies, and design interventions for types of errors and improve patient safety. Since pharmacists as well as pharmacy staff's hold a vital role in dispensing medications, your answers will be very useful for comprehending the difficulties of lessening medication mistakes and carrying out safe pharmaceutical procedures.

WHAT WOULD TAKING PART INVOLVE?

As part of this research, you will be asked to complete a semi-structured questionnaire via Google Forms. This questionnaire will gather in-depth information about your experiences with dispensing errors, current safety protocols, and potential improvements for pharmacy practices. The questionnaire can be completed at a time that is most convenient for you and is estimated to take approximately 20-30 minutes. The responses you provide will help me to understand the challenges and strategies related to dispensing errors and patient safety.

WHY HAVE YOU BEEN INVITED TO TAKE PART?

You have gained pharmacy experience in South Dublin which makes you eligible for the present study. Your knowledge about medication dispensing together with your expertise in error prevention strategies will substantially contribute to recommendations that enhance patient safety.

DO YOU HAVE TO TAKE PART?

Participation in this study is strictly voluntary, and you can withdraw from this study at any time for no reason. A choice not to participate will result in nullification of any past or deferred data you have provided to us concerning the study.

WHAT ARE THE POSSIBLE RISKS AND BENEFITS OF TAKING PART?

The risks of participating in this study are minimal. The only potential inconvenience may be the time required to complete the study. The confidentiality and data security will be tight. By participating, you will contribute valuable insights into how dispensing errors can be reduced in pharmacies. Your input may also help improve pharmacy safety protocols, ultimately leading to a reduction in medication errors and enhanced patient safety in the long term.

WILL TAKING PART BE CONFIDENTIAL?

All data will be secure and your responses entirely anonymous. You may break confidentiality only if there is a serious risk of harm to yourself or others. The responses submitted through Google form will be securely held. After the study is finished all data will be kept for two years after which it will be permanently erased. The findings will only be used for my dissertation and can be published in academic papers if they contain no identifying participants.

HOW WILL INFORMATION YOU PROVIDE BE STORED AND PROTECTED?

The research data will be securely stored in password-protected digital files and backed up on an encrypted external drive to safeguard against unauthorized access. Only the researcher will have access to the data, which will be permanently deleted upon completion of the study.

WHAT WILL HAPPEN TO THE RESULTS OF THE STUDY?

This research study is intended solely for submission as part of my dissertation. In accordance with academic regulations, the completed dissertation will be made accessible in the college library. At present, there are no plans to further disseminate the findings through conferences, academic publications, or other educational platforms.

WHO SHOULD YOU CONTACT FOR FURTHER INFORMATION?

Anupriya

Griffith College Dublin

aanumol54@gmail.com

If you have any questions or concerns, please don’t hesitate to get in touch with me.