# Moving to The Next Level of Practice: A Qualitative Analysis of Pharmacists' Reflections on Clinical Decision-Making

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**Abstract**

**Objectives:** Clinical decision-making (CDM) is a significant, though complex, process for healthcare professionals, including pharmacists. Although CDM is recognised as an essential process in pharmacy, it has not received extensive research attention. This study explores pharmacists' CDM by qualitatively analysing reflective essays from postgraduate students enrolled in the MSc program in Advanced Clinical Pharmacy Practice at the University of Strathclyde. To analyse reflective essays to identify commonalities in pharmacists' CDM processes, enhancing understanding of their role and confidence in clinical decision-making.

**Methods:** A qualitative, inductive thematic analysis of 40 pharmacists' reflective essays was conducted. The coding process was carried out using NVivo software to analyse and organise qualitative data. Data analysis followed Braun and Clarke's six-phase framework. A non-pharmacist researcher independently coded 20% of the essays (randomly selected).

**Results:** Four main themes emerged from data analysis: the complexity of patient cases, analysis and decision-making, factors influencing CDM, and future consideration. These findings reflect that CDM is a complex process that necessitates critical thinking and a rational, stepwise process. In pharmacy, it involves assessing patient cases, gathering and analysing data, identifying issues, setting goals, taking appropriate measures, and evaluating outcomes. Pharmacists face multiple challenges that hinder the CDM process, such as case uncertainty and time constraints. Confidence was reported as a barrier or facilitator to pharmacists' decisions.

**Conclusions:** The study underscores the complexity of CDM in pharmacy practice, highlighting the significant role of pharmacists' experience, evidence-based practice, and confidence in the CDM process. Addressing challenges

such as workload and time constraints through systemic changes and ongoing professional development can enhance pharmacists' CDM capabilities. The findings emphasise the importance of MDT collaboration and patient involvement in the CDM process to improve clinical outcomes. Further research should explore interventions to mitigate these challenges and support pharmacists in their critical role in patient care.

**Keywords:** Clinical Decision Making (CDM); Pharmacist; Qualitative Study, Reflective Practice, Education.

## Introduction

Over the years, the pharmacy profession has progressed from a typical drug-focused profession to an advanced patient-centred practice.[1] The expanded role focuses on pharmaceutical care concepts to provide comprehensive health care services. [1] The current shift in pharmacy practice includes broadening its scope and, in some areas, allowing pharmacists the authority to prescribe medications in specific situations. For instance, in the United States, the federal government and over 40 states have regulations allowing pharmacists to engage in collaborative drug therapy management. [2] In the United Kingdom, there are already pharmacists as independent prescribers, and starting in September 2026, all newly certified pharmacists will become independent prescribers upon their registration.[3] Additionally, the recent incorporation of pharmacists into different primary care settings broadens the domain of the pharmacy profession.[4] This further expansion represents a transition from the conventional function of dispensing medications to one in which pharmacists are primarily viewed as medication specialists, with clinical care as a basic professional duty and the responsibility of making therapeutic decisions.[4] Moreover, several developed countries, including Australia, the United States, and the United Kingdom, have acknowledged the evolving roles of community pharmacists in delivering a range of healthcare interventions, such as chronic disease management. [5, 6] In the context of clinical pharmacist interventions, according to a study, clinical pharmacists' recommendations assisted in avoiding and minimising a wide range of drug-related problems (DRPs), such as untreated conditions with a clear indication, medicine selection issues, incorrect doses, and their consequences, and these suggestions were usually highly welcomed by physicians.[7] It concluded that enhancing and maintaining clinical pharmacy services in neurological wards and intensive care units may result in more rational drug prescribing and improved patient safety.[7]

Supporting the expansion role of pharmacists is the increasing awareness of the importance of pharmaceutical care in providing a wide range of health services to patients. The increased complexity of treatment and polypharmacy necessitates the organised and active engagement of pharmacists in patient care.[8] Pharmaceutical care establishes a structure for pharmacists to utilise their expertise and abilities effectively.[9] It is a patient-focused approach and set of principles that strive to enhance the advantages of medication treatment while reducing potential risks to patients. [9] Pharmacists evaluate patients' medication requirements and work alongside other healthcare providers to ensure those needs are met.[9] According to Hepler and Strand's commonly recognised definition, ‘Pharmaceutical care is the responsible provision of drug therapy to achieve definite outcomes that improve a patient's quality of life. [10] The patient care process involves assessing drug-related needs, creating a tailored care plan, and conducting follow-up evaluations to assess the impact of decisions and actions. [11] Two Cochrane reviews

found that combining pharmaceutical care with pharmacist-provided services significantly improved care quality, clinical outcomes, and prescribing results. [12]

To provide high-quality pharmaceutical care in a clinical role, clinical decision-making is considered a core process.[13] The recognition of evidence-based clinical decision-making emerged in the early 1990s, posing considerable hurdles to the introduction and implementation of clinical guidelines in daily practice across different settings, including pharmacy. [1] According to research, patients frequently receive unnecessary and potentially risky care, sometimes exceeding the physicians' experience and capabilities. [1] Clinical decision-making is a significant step in pharmaceutical care that requires cognitive abilities to make patient-centred therapeutic decisions. [13] In pharmacy practice, CDM involves the way pharmacists engage with patients and healthcare teams in situations where the diagnosis has been identified but treatment alternatives may not be ideal yet.[14] Therapeutic decision-making encompasses the skills, knowledge, and steps necessary to optimise pharmacological therapy for specific patients. [4] Clinical decision-making theories serve as frameworks for healthcare professionals to make effective and ethical decisions in patient care that minimise errors and improve patient outcomes in medicine. [15,16] There are many different clinical decision-making theories, such as the hypothetico-deductive model, the clinical reasoning cycle, and the dual process theory. The hypothetico-deductive (HD) method, also referred to as the scientific method, is a cyclic pattern of reasoning and observation that is used to produce and test proposed explanations for an unexplained medical issue.[17] Despite its value, the HD approach does not guarantee success, as there are numerous reasons for potential failure, such as the practitioner failing to uncover the correct causal explanation or experiencing restrictions while evaluating hypothesised causes. [17] Clinical reasoning includes finding signals, interpreting information, comprehending patient problems, designing interventions, assessing outcomes, and reflecting on the process. [18] Dual Processing Theory states that cognitive processes are driven by the alleged systems I (intuitive, automatic, quick, narrative, experiential, and affect-based) and II (analytical, slow, verbal, deliberative, and logical).[19] According to Rona Honnet, senior specialist tutor, NHS Education for Scotland, the ARM model (Aims, Risks, and Mitigation of Risks) is a useful tool developed by NHS Education for Scotland (NES) to assist pharmacists in making good and patient-focused decisions and to help them feel confident during the patient care process (Figure 1). The aim includes prescribing effectively; pharmacists need to clearly understand their reasons for prescribing and what their aim is to achieve with the prescription. When considering treatment, it is essential to evaluate its known risks, understand the factors that influence these risks, and identify any specific risk factors relevant to the patient, including whether these risks are modifiable.

Additionally, it is crucial to weigh the potential risks against the possible benefits of the treatment and ensure that the patient agrees with the proposed approach. Lastly, risk mitigation is to limit risks and optimise potential benefits; consider if switching between drugs within the same class or using second-line options can alter the risk-benefit ratio. Additionally, determine if dose adjustments or titration are necessary, assess if the patient requires additional monitoring to minimise risks, and evaluate whether patient education or support might be beneficial. [20]

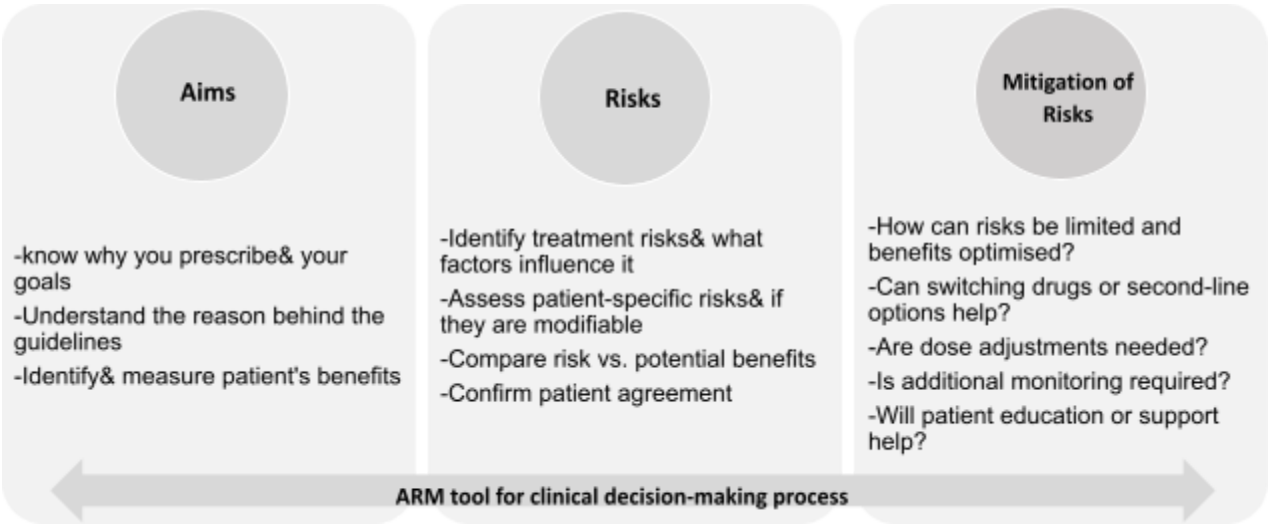


**Figure 1:** ARM model for Clinical Decision-Making Process.

Despite its importance in pharmacy practice, therapeutic decision-making is under-represented in pharmacy education. [4] A recent study (2020) conducted in New Zealand found a need for a purpose-built curriculum in undergraduate and postgraduate programs, which is important in assisting students and pharmacists in developing a strategy for making prescribing decisions. [4] Certain universities started incorporating clinical decision-making into advanced clinical pharmacy courses, such as the University of Strathclyde, the University of Exeter, the University of Birmingham, and Liverpool John Moores University. [20,21,22,23]

This study aims to conduct a qualitative analysis of the written reflective essays on clinical decision-making to identify commonalities across submissions and further inform the theories of the pharmacists' role and confidence in clinical decision-making. The objectives of data analysis are listed in Table 1.

**Table 1:** Objectives of data analysis.

| **Objectives of reflective essays' analysis** | |
|---|---|
| I. | To identify trends and recurrent themes in pharmacists' reflections regarding their clinical decision-making process |
| II. | To assess how pharmacists, apply decision-making theories in practice |
| III. | To explore how patient interactions, including communication and patient preferences, influence pharmacists' clinical decisions. |
| IV. | To identify particular areas in which pharmacists lack confidence or expertise in making a clinical decision |
| V. | To explore pharmacists' reflections on the negative outcomes of CDM and understand how they cope after it |
| VI. | To develop practical recommendations based on data analysis to improve clinical decision-making among pharmacists |

## Methods

The University of Strathclyde introduced a new teaching module in the MSc Advanced Clinical Pharmacy Practice postgraduate course in 2023. It was introduced after a review of the MSc advanced clinical pharmacy practice course in 2021. It aims to thoroughly examine, integrate, and enhance understanding related to clinical decision-making skills, and apply this knowledge to deliver patient-centred, holistic care at individual and service levels. The module is intended for pharmacists in all sectors. It holds 20 credits and runs in two semesters. The module assessment includes three written reflections and a case-based discussion presentation[20] (Figure 2).

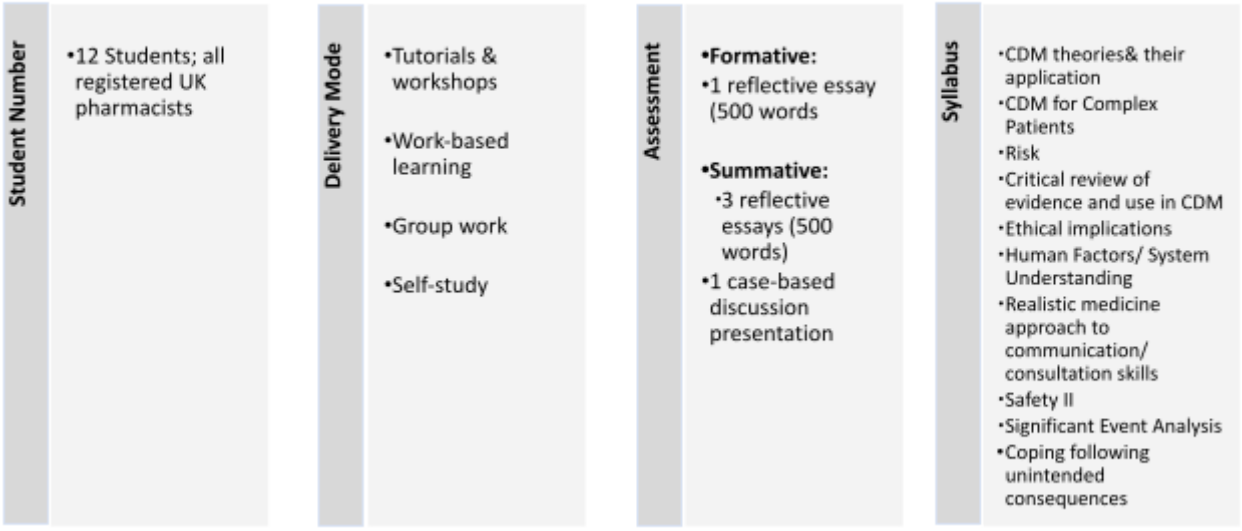


**Figure 2:** University of Strathclyde CDM course descriptor.

The University of Strathclyde introduced a clinical decision-making course into the post-graduate MSc in Advanced Clinical Pharmacy Practice, tailored for pharmacist prescribers. Within this module, students are required to submit four reflective essays each accounting for 500 words on their clinical decision-making experiences, including situations where they (1) participated in complex clinical decisions, (2) had to find and interpret evidence to guide clinical decisions, (3) engaged patients in shared decision-making, and (4) managed the negative outcomes of clinical decisions. [20] The Driscoll reflection model, created by Driscoll in the 1990s, was the recommended structure for students to follow when submitting their reflective submissions. It is an organised method for reflecting on professional experiences using three main questions: "What?" (describe the situation), "So What?" (analyse its significance and decision-making), and "Now What?" (plan future actions). This model is widely used in education and healthcare to encourage critical analysis and continuous professional development by guiding practitioners through a process of describing, analysing, and learning from their experiences. [24] (Figure 3). The students' reflective essays are assessed according to their reflections on these three questions.[20]


**Figure 3:** Pharmacist reflection on complex case experience utilising the Driscoll Reflection Model

The data of this qualitative study consisted of reflective essays written by postgraduate students in the Advanced Clinical Pharmacy Practice course that were analysed using inductive thematic analysis. Given the exploratory nature of the study, an inductive approach was selected for this research since it is well-suited for producing new hypotheses and insights straight from the data. Because themes are allowed to arise organically from the reflective essays without being restricted by pre-existing theories or categories, the analysis is firmly based on the experiences and viewpoints of the participants.[25] NVivo was the software used to assist in organising and analysing the qualitative data. Participants' consent was obtained at the time of submitting reflective essays.

Thematic analysis is a qualitative data analysis method that involves searching through data to recognise, analyse, and report the same patterns. [26] The selection of thematic analysis for this project was based on its appropriateness for exploratory research, which allows the identification of patterns and themes within data sets without being limited by pre-established classifications.[27] Additionally, it focuses on finding and analysing patterns and themes within the data collection, as opposed to content analysis, which frequently quantifies the existence of specific words or concepts. [27] This enables a more comprehensive insight into the pharmacists' decision-making processes. The data analysis process followed Braun and Clarke's six-phase framework for thematic analysis. It included familiarisation with the data through initial reading and re-reading the essays, generating initial codes to systematically capture interesting features, searching for themes by collecting codes, reviewing themes to ensure they work with the coded extracts and the entire data set, defining and naming themes through ongoing analysis to refine the specifics of each theme, and producing the report with final analysis and write-up[28] (Figure 4).

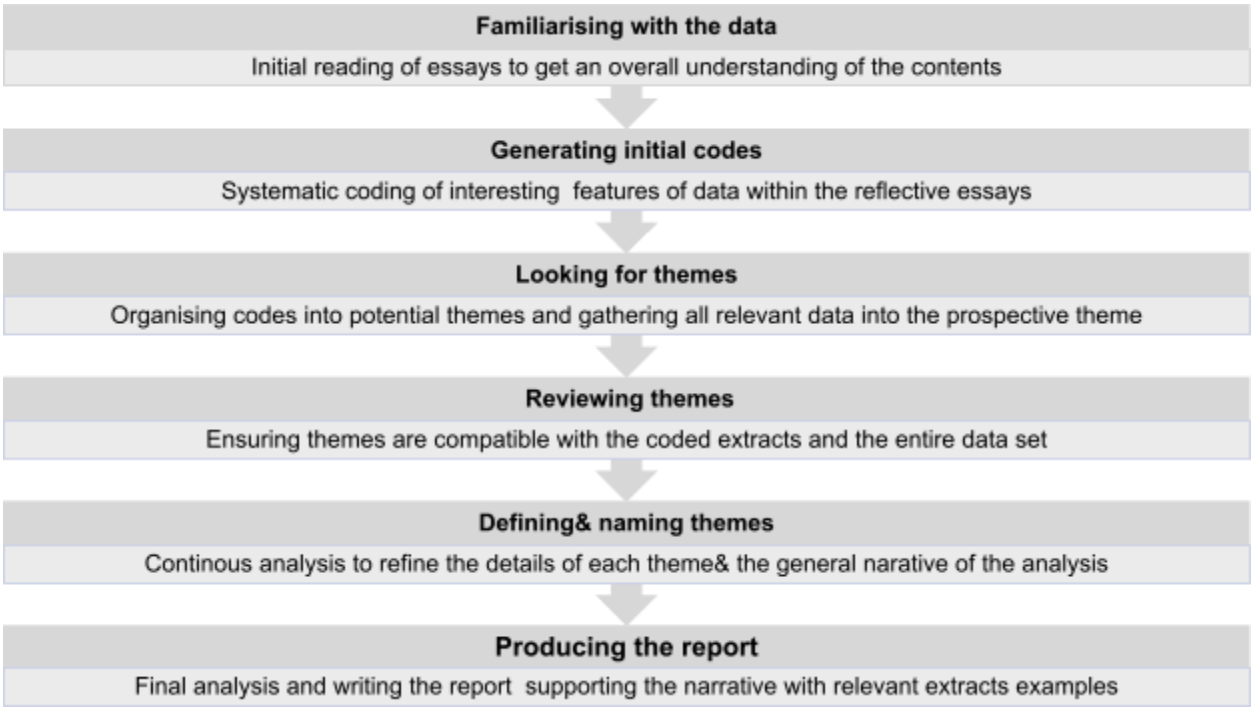


**Figure 4:** Data analysis following Braun and Clarke's six-phase framework

To enhance the credibility and reliability of the qualitative analysis, a non-pharmacist researcher (AF) independently coded 20% of the essays selected randomly. This step is critical for maintaining objectivity and ensuring the uniformity of the coding process. The coding findings from the pharmacist (FA) and the non-pharmacist researcher (AF) were compared. Several meetings were held to discuss any differences in the coding. These discussions aimed to reach a consensus and refine the coding structure.

Since this is my first time conducting qualitative research, I have placed a strong emphasis on reflexivity to ensure the study's validity and reliability. Reflexivity includes ongoing self-examination and reflection on how attitudes, beliefs, and experiences may affect the study process and findings. [29] As a non-UK pharmacist, though not a prescriber yet, I recognised that my professional background and cultural context could influence my interpretation of the data. To address any potential biases, I actively engaged in ongoing self-reflection throughout the research process and worked together with a non-pharmacist researcher during the coding stage. By bringing reflexivity throughout the research process, I aim to give a fair and comprehensive examination of the reflective essays on pharmacists' CDM. This approach assists in balancing my insider knowledge with an external perspective, enhancing the rigour and validity of the analysis.

## Results

Eleven pharmacists agreed to participate in this study. In total, 40 reflective essays were included, including formative and summative reflective essays. This analysis aimed to explore postgraduate students' reflective essays concerning CDM. These essays reflect pharmacists' experiences with the clinical decision-making process, their

roles, confidence, challenges faced, and their experience with CDM theories to guide their decisions. The findings are grouped into main themes derived from the inductive thematic analysis. The demographic characteristics of the participants are listed in Table 2.

**Table 2:** Demographic characteristics of the study participants.

| Participant characteristic | Sample size (n=11) |
|---|---|
| **Gender:** | |
| Male | 3 |
| Female | 8 |
| **Work setting:** | |
| Hospital Pharmacy | 8 |
| Community Pharmacy | 3 |
| **Additional Degree:** | |
| PhD | 2 |

A common theme that emerged from the essay's analysis was the range and complexity of patient cases faced by pharmacists in their clinical practice. Participants discussed situations ranging from acute treatment decisions to chronic disease management, emphasising the complexities of these cases. Within 40 reflective essays, most cases involved high-risk patients, high-risk medications, cardiovascular diseases, uncontrolled patient conditions, co-morbidities, elderly patients, and limited experience with the situation, as illustrated in Table 3 below.

**Table 3:** Theme 1: Complexity of patient cases experienced by study participants.

| Case Type | Description | Essay Extracts |
|---|---|---|
| High-risk patients | Cancer patients, pregnant, delirium& dementia patients, epilepsy, fall and long lie, and nil-by-mouth patients. | “This case was complex as it involved new and rare medications, in a high-risk, immunocompromised patient.” P2, RE2.2 |
| High-risk medications | Chemotherapy, anticoagulants, biological medications, opioids, and psychotropic medications. | I was involved in clinical decision-making when asked by cardiology to prescribe digoxin for a patient with a history of pAF and LVSD.” P8, RE8.1 |
| Cardiovascular diseases | Hypertension, Diabetes, Heart failure, atrial fibrillation, and myocardial infarction | “a 92-year-old lady was diagnosed with Deep Venous Thrombosis (DVT) and her past medical history included hypertension, Atrial Fibrillation (AF), type 2 diabetes and depression.” P1, RE1.4 |
| Uncontrolled patient Condition | Hypertension, migraine, cancer, asthma, COPD, and schizophrenia. | “patient was admitted to the Acute Medical Unit with new atrial fibrillation (AF)” P12, RE12.2<br>“38-year-old female. Crohn's disease, axial spondyloarthropathy. Refractory to multiple standard and biological therapies.” P10, RE10.1 |

| | | |
|---|---|---|
| Co-morbidities | Most cases were patients having more than two chronic diseases including depression, hypertension, malignancies, asthma, COPD, and diabetes. | "a 92-year-old lady was diagnosed with Deep Venous Thrombosis (DVT) and her past medical history included hypertension, Atrial Fibrillation (AF), type 2 diabetes and depression." P1, RE1.4 |
| Elderly Patient | Most cases were elderly patients above 80 years old. | "85-year-old resident of a Care Home." P3, RE3.2<br>This case involved an 87-year-old male who was recommended an oral anti-coagulant by cardiology, for atrial fibrillation" P2, RE2.3 |
| limited experience with the situation | Not experienced such a case in the past, the case is out of their expertise, limited experience with certain medications, or relatively new in prescribing specialised medications. | "I am a relatively new SACT prescriber" P9 RE9.1<br>"I had no previous experience of prazosin being recommended for this indication." P8, RE8.2 |

A major theme that evolved from coding the essays was the decision-making process. Participants reflected in their essays that decision-making is a complex process that necessitates systematic critical thinking. It involves comprehensive patient assessment, utilising guidelines and evidence, considering CDM theories to guide the process, involving a multidisciplinary team (MDT), involving the patient or carer, considering treatment risks and benefits, and benefiting from own knowledge and experience (see Table 4).

**Table 4.** Theme2: Analysis and CDM.

| Component | Description | Essay Extract |
|---|---|---|
| Comprehensive patient case assessment | Collecting patient data including past medical history, lab results, signs& symptoms, looking into discharge or referral letters or any patient documentation. | "I reviewed information from the submitted referral form, the patient's electronic care record (ECR) and the clinic appointment letter." P 10, RE10.2 |
| Guidelines and evidence utilisation | Looking for evidence and utilising guidelines to support decision-making. | "I Initially referred to each SmPC and BRIGGs then completed a literature review looking for case reports. I also submitted an enquiry to local Medicines Information team to consolidate the information I gathered." P9, RE9.2 |
| CDM theories consideration | Applying CDM theories such as the clinical reasoning cycle, dual processing theory, and ARM model to guide the decision process. | "It was most helpful to think about this case in terms of the 'aims, risks, mitigation' clinical decision-making" P4, RE4.1<br>"The Clinical Reasoning Cycle was useful to follow the full process and it made me feel more confident in my decision to give apixaban as it helped to consider the process logically, including the issues, goals and actions available." P12, RE12.2 |
| MDT involvement | Collaboration with MDT to ensure comprehensive patient care. | "After making my decision I contacted cardiology as I was aware that my decision may |

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|---|---|---|
| | | alter the management plan. Cardiology accepted my decision" P8, RE8.1 |
| Considering treatment risks and benefits | One of the most important steps in the decision was weighing the potential risks and benefits of treatment options to make a balanced decision. | "I eventually recommended candesartan because my aim was to improve the patient's migraines without worsening her mental state or giving her access to lethal drugs." P4, RE4.1 |
| Involving patient or carer | Most participants reflected on the importance of engaging patients or their carers in the decision-making process to ensure their preferences are considered. | "They stated they appreciated being involved in the decision-making. P7, RE7.3<br>"The patient decided to start methotrexate therapy after understanding that she was ineligible for biologic treatment." P10, RE10.3 |
| Benefiting from own knowledge& experience | Use of knowledge and experience in the CDM process to aid faster and more effective decision-making. | "Responses were intuitive as I have an in-depth knowledge of the RA departmental pathway" P10, RE10.3 |

All participants in this study primarily reflected a range of factors that influenced their CDM process;10 out of 11 participants mentioned challenges that they faced during the decision-making process. The most common factors included the pharmacist's level of experience and knowledge, the patient or carer's involvement in this process, the source of evidence and the data availability about the patient's situation, specific patient factors, time availability, and pharmacist skills (see Table 5).

**Table 5:** Theme3: Factors influencing the CDM as reported by the study participants.

| **Factor** | **Description** | **Essay Extracts** |
|---|---|---|
| Level of experience and knowledge of the pharmacist | Years of experience and level of pharmacist knowledge were significant factors in strengthening CDM. There is a direct correlation between the level of expertise and knowledge and the effectiveness of decision-making. | "This may have been an influencing feature in my decision-making as I personally had previous experience and knowledge of this scenario and this clinical decision had given me a good outcome in the past." P2, RE2.4<br>"My lack of experience and confidence around clinical assessment of acute symptoms negatively affected my decisions" P9, RE9.1 |
| Patient or carer involvement | Involving patients or carers in CDM resulted in patient-centred care and improved patient treatment compliance and patient satisfaction. However, some patients are not easy to communicate with and participate in decision-making; this depends on, for example, personality or mental state. | "I also knew how to speak with the patient in a way that she understood, and had the opportunity to feel listened to and ask questions. This aided in the decision-making process" P11, RE11.3<br>"I found communication with the patient challenging as they were down-playing her symptoms" P9, RE9.1<br>"involving the patient in the decision-making process was challenging as they failed to accept the severity of their health condition and dismissed most of my |

| | | |
|---|---|---|
| | | arguments for secondary prevention medication." P8, RE8.3 |
| Source of evidence and data availability | The availability of evidence and full patient data aided in fast and successful CDM. Lack of evidence about the patient's case, or treatment complicated the process, yet information overload was also reported to make CDM harder to make. | "I felt secure in using NEWT and NICE as they are trusted sources of evidence, so this supported my decision-making nicely." P3, RE3.2<br><br>"I also found this to be complex as there was a limited body of evidence to search, as these medications were so new." P2, RE2.2<br><br>"This case was challenging as I was not aware of this possible side effect until then and, as I do not often look at primary evidence, I felt lost in the amount of available data. Also, it was hard to identify the right source and evidence among all the available publications." P1, RE1.2 |
| Consider patient factors | Considering patients' factors aided in making appropriate CDM and holistic patient management, yet it was challenging when there was uncertainty about patients' situation and optimal treatment. | "The decision considered factors such as age, disease, comorbidities and drug data. Importantly the patient was presented these risks" P10, RE10.2<br><br>"Risk was the most significant factor I considered when making my decision." P8, RE8.1<br><br>"On reflection I think prescribing in patients with an asthma/COPD overlap can be a 'grey area', which can feel challenging." P3, RE3.1<br><br>"This case was considered complex as there was no clear decision as to whether the patient should be anti-coagulated or not." P2, RE2.3 |
| Time | The impact of time availability or constraints on the quality of CDM | "I had time to investigate primary literature resources and discuss with colleagues before making a decision." P10, RE10.1<br><br>"I was under a time pressure on the ward round to give an answer, so felt I did not have the opportunity to gather as much data as I would have liked." P12, RE12.1<br><br>"It was difficult due to time pressures, attempting to discharge the patient quickly." P12, RE12.2 |
| Pharmacist skills | Pharmacists' skills impact the CDM process such as personal, communication, critical thinking skills | "My decision-making was influenced by my motivation to find a safe and suitable alternative for this lady, and my skills in contextualising<br><br>information and clinical reasoning." P4, RE4.1 |

Pharmacists' confidence and competence emerged as a significant sub-theme from the data analysis, which is associated with factors influencing their clinical decision-making. Most pharmacists reflected on how confidence

strongly contributed to their decision-making process. According to their reflective essays, confidence is linked to pharmacists' knowledge and skills, past experiences, availability of evidence, use of CDM theories, and MDT involvement (see Table 6).

**Table 6:** Pharmacists' confidence and competence.

| Influence | Description | Essay Extracts |
|---|---|---|
| Pharmacists' knowledge and skills | Theoretical knowledge and practical skills strengthen pharmacists' confidence in making decisions, including data interpretation | "In making this clinical decision I felt reasonably comfortable. Having studied respiratory for my independent prescribing qualification I felt confident to make this decision." P2, RE2.1<br>"It was straightforward to process information as the patient could give a good description of his symptoms and I had recent spirometry results to explain my reasoning." P3, RE3.1 |
| Past experiences | Accumulated experience boosts pharmacist's confidence | "I have been in contact with the patient and his symptoms have improved. This has given me more confidence to make similar changes in future, depending on individual patient symptoms and results" P3, RE3.1 |
| Availability of evidence | Evidence availability supports pharmacists' confidence in the CDM process | "I was confident using the evidence found as it was clearly stated and published by reputable sources." P6, RE6.2 |
| Use of CDM theories | Different CDM theories guide the CDM process in a more rational way | "Using the clinical decision-making theories helped in this case as thoroughly collecting the cues meant I could appropriately counsel the patient on the risk factors he was facing." P2, RE2.3<br>"I was confident initiating the plan and operated in System 1" P6, RE6.1 |
| MDT involvement | Discussing with peers supports pharmacist's confidence and leads to effective decision-making | "I was glad I liaised with MI as their findings matched my own which gave me some confidence that I approached this situation using the correct skillset and resources" P9, RE9.2<br>"I was nervous at the lack of information and the unclear diagnosis on the ward round but felt better after discussing this with the medical team." P12, RE12.1 |

Nine essays were about a situation where there was a negative outcome linked to the pharmacist's clinical decision-making. Participants reflected on different factors that led to negative outcomes, including situational factors, local working conditions, organisational factors, communication, cultural factors, and external factors (see Table 7).

**Table 7:** Factors linked to the CDM negative outcomes.

| Factors | Description | Essay Extracts |
|---|---|---|

| | | |
|---|---|---|
| Situational factors | Staff factors such as fatigue, distraction, inexperience, stress, or rush. | "stress of working alone onward" P1, RE1.4<br>"there were distractions and interruptions" P4, RE4.4 |
| | Situation characteristics: unfamiliar case, difficult patient situation, or complex case | "it was an unusual situation" P4, RE4.4<br>"This was, however, a complex patient (co-morbidities)" P7, RE7.4 |
| | Patient factors such as complex patient history | "This was a difficult patient with complex medical and surgical background." P10, RE10.4 |
| Local Working Conditions | Workload | "A major contributing factor was workload pressure. I was doing too much and didn't have time to think about the risk after the second dose." P4, RE4.4 |
| | Staff Insufficient | "lack of staffing. During my clinic, there were no other prescribers available to discuss my clinical decision-making process with," P8, RE8.4 |
| | Device failure | "the oncall laptop was not working so could not visualise trends in renal function myself." P12, RE12.4 |
| Organisational Factors | Physical environment such as Lack of space, noise in the area | "Human factors influencing my decision making and therefore the outcome included environment as it was a busy clinic." P9, RE9.4<br>"time pressures as the area I was using was also being used for another clinic." P6, RE6.4 |
| Lack of guidance | Lack of recommendation or guidance | "there was unclear guidance on what to do in similar situations," P12, RE12.4 |
| External Factors | National and local policies and recommendations | "Potentially the negative outcomes could have been mitigated had I prescribed an alternative antihypertensive, but bendroflumethiazide was guided by local guidelines and formulary." P8, RE8.4<br>"I may also have been biased by the knowledge that all treatments recommended on the guideline included a steroid component." P2, RE2.4 |

To enhance their clinical decision-making in the future, pharmacists reflected on their past experiences. Each participant had different future considerations; some considered a specific area to focus on, whereas others contemplated broader plans. The most common plans reflected by the study participants were the following: using

past expertise for enhanced future clinical practice, applying CDM theories to guide their decision-making process, considering shared decision-making approaches, proposing strategies to avoid negative outcomes of CDM, considering MDT involvement, and planning to attend professional development programs to boost their knowledge and skills (see Table 8).

**Table 8:** Theme 4: Future considerations as reported by the study participants.

| Future Consideration | Description | Essay Extracts |
|---|---|---|
| **Future use of expertise** | Learning from past clinical experiences and using these experiences to enhance their CDM and confidence in the future | "This felt like good teamwork and gave me confidence to prescribe in more unfamiliar situations in future, knowing where to look for strong evidence." P3, RE3.2<br>"I will use my expert knowledge more confidently to supplement complex decisions where evidence is not established." P9, RE9.2 |
| **Focus on specific practice area** | Improve skills for better practice in the same situation | "I will pay more attention to the potential toxicity of drugs in future when I am caring for patients at risk of suicide and self-harm." P4, RE4.1 |
| **Broader plan** | Consider more than one action for better practice in the future such as developing skills, building relationships with MDT, sharing past expertise with others | "I plan to further develop my research skills. I wish to further develop MDT relationships such as in this case where both the rheumatology MDT and the gastroenterology MDT discussed the patient separately. Such relationships ensure complete holistic care for the patient and best clinical decision-making. Lastly, to prevent negative outcomes I want to develop a poster on this complex clinical decision to show at upcoming conferences to share acquired knowledge and facilitate learning to other people." P10, RE10.1 |
| Application of CDM theories | Using clinical decision-making theories to guide and structure the decision process. | "In future I will consider aims, risk and mitigation to help me to decide." P12, RE12.1<br>"This scenario has taught me that the Clinical Reasoning Cycle is a beneficial tool to apply to my practice," P8, RE8.3 |
| Considering the Shared Decision-making Approach | Involving patients and their carers in the decision-making process. | "I have reflected that an easy or small decision to me, may be very important to the patient so should be discussed where possible and I will do this in future." P12, RE12.3 |
| Proposing strategies to learn from CDM negative outcome | Consider measures to learn from the risks and negative outcomes associated with clinical decisions | "it could have been useful to share the mistake with my colleagues during the weekly meeting to prevent similar errors in future and to show that negative outcomes are inevitable, but same mistakes could be preventable." P1, RE1.4 |

| | | |
|---|---|---|
| MDT involvement | Consider collaboration with other healthcare professionals to enhance the CDM | "In future, I will discuss with my team as I found this helpful and reassuring to review what decision my colleagues would have made." P12, RE12.4 |
| Ongoing professional development | Plan for and attend continuous professional development programs to improve skills and knowledge | "highlighted a knowledge gap that I intend to address by speaking to the MI team to query any training or resources they can direct me to improve my skills." P6, RE6.2<br><br>"Although I feel I made the right decision to withhold treatment, I should be able to confidently assess "red" symptoms as per the UKONs criteria, therefore I intend to do training on this." P9, RE9.1 |

## Discussion

The purpose of this critical study was to explore pharmacists' clinical decision-making using a qualitative study of postgraduate students' reflective essays. Reflective practice is a key component in this study, highlighting pharmacists' skills development in CDM. Reflective practice entails learning from experiences to develop new insights about oneself and one's professional activities.[30] Additionally, it raises awareness of one's professional knowledge and behaviour by questioning presumptions made in daily practice and evaluating one's reactions to different practice scenarios critically.[30] The study followed inductive thematic analysis and recognised numerous major themes, including the complexity of the patient cases, analysis and decision-making, factors influencing CDM, and future considerations. These findings are critical for understanding the complexities and impact on pharmacists' CDM and identifying areas for improvement in education and practice. Furthermore, the findings highlight the value of reflective learning as a tool for strengthening pharmacists' clinical reasoning and supporting continuous professional development. Integrating reflective activities within postgraduate pharmacy education may therefore help pharmacists critically evaluate their clinical decisions and improve their future practice.

The themes recognised in this study are similar to existing literature on CDM in healthcare. It has been recognised in the literature that health professionals engage in complex clinical decision-making processes that extend beyond just selecting an option from a few available choices.[31] It entails various aspects, including diagnosis, intervention, engagement, and evaluation within dynamic environments. [31] Efficient CDM entails a systematic approach of evaluating patients, collecting and analysing data, and selecting an appropriate action based on evidence-based medicine, as indicated by previous research.[32] The clinical importance of pharmacists' involvement in medication management has also been demonstrated in regional studies. Research published in the *Oman Medical Journal* reported that pharmacist-driven clinical care activities significantly reduced hospital readmissions, highlighting the growing contribution of pharmacists to patient care and healthcare outcomes. [33] In this study, most participants reflected on the importance of involving MTD and patients in CDM. Similarly, a study that investigated therapeutic decision-making in primary care pharmacy practice showed that participants' emphasis on the clinical

decision was explained in terms of involving other healthcare providers and patients.[4] Additionally, participants reflected on how their knowledge, clinical experience, and skills support their CDM process. Likewise, in literature, it has been recognised that pharmacists believe that the integration of theoretical knowledge, abilities, and clinical experience is crucial for their ability to carry out effective CDM.[13] The challenges faced by pharmacists, including lack of evidence and uncertainty about patient cases, are also recognised in previous literature.[34] Pharmacists often face significant clinical uncertainty when reviewing complex cases such as polypharmacy, highlighting the need for stronger decision-making frameworks and educational strategies to support clinical reasoning in practice. [35]This study contributes to current knowledge by offering detailed insights into the factors that influenced the pharmacist's CDM process. Moreover, it highlights the importance of continuous professional growth, which can boost pharmacists' CDM. These findings also reinforce the importance of strengthening reflective learning and experiential training within pharmacy education, as these approaches can support the development of critical thinking and clinical reasoning skills required for effective decision-making. In addition, the findings have broader implications for healthcare practice and pharmacy education, particularly in Oman and the wider Middle East. As healthcare systems in the region continue to evolve and place increasing emphasis on patient-centred care and multidisciplinary collaboration, pharmacists are expected to take on more active roles in clinical decision-making and medication management. Strengthening pharmacy education and professional development programmes that emphasise reflective practice, clinical reasoning, and interprofessional collaboration may therefore support pharmacists in meeting these expanding professional expectations.

The study's strengths include its qualitative inductive method, which provides in-depth insights into pharmacists' experiences as well as the various perspectives of both hospital and community pharmacists. Additionally, involving a non-pharmacist researcher in the coding process improves data analysis by incorporating different viewpoints and mitigating bias, hence enhancing the reliability of the findings. This approach also strengthened the credibility of the thematic analysis by reducing the potential influence of professional bias during data interpretation. However, limitations include the relatively small sample size, which may limit the transferability of the findings beyond the study participants. In addition, the data were derived from self-reported reflective essays, which may be subject to cognitive or social desirability biases, as participants may present their experiences in a more reflective or favorable manner. Furthermore, the participants were drawn from a single cohort of postgraduate students within one institution, which may restrict the generalisability of the findings to other educational or professional contexts. Further research using larger and more diverse samples across different educational institutions and practice settings has the potential to enhance the robustness and generalisability of these findings.

To expand upon these findings, future research should focus on developing and testing specific interventions that enhance CDM among pharmacists. Research could explore the effects of customised continuous professional development programs on enhancing CDM skills. Additionally, studying the effects of systemic changes, such as optimising working areas and managing staff factors such as workload, on pharmacists' CDM would be valuable. Research should also consider the role of technology in supporting decision-making processes and evaluate MDT collaboration models that can enhance CDM in hospital and community pharmacy settings.

Future research involving larger and more diverse participant groups across different healthcare settings would also help strengthen the generalisability of these findings. In particular, studies conducted within different healthcare institutions in Oman and across the Middle East may provide further insights into how contextual and organisational factors influence pharmacists' clinical decision-making.

## Conclusions

The study findings provide a deeper understanding of the pharmacist's reflection on the CDM process and highlight several key themes, including the complexity of patient cases, the decision-making process, factors influencing CDM, and future considerations. The results emphasise the significance of comprehensive patient evaluation, evidence-supported theories, and ongoing professional growth. Significant challenges were identified, including a lack of evidence, time limits, difficulties in communicating with some patients, and uncertainty about patient cases. Addressing these challenges will necessitate systemic changes and more training programs. Pharmacists' confidence and competency in CDM were found to be enhanced strongly by experience, speciality knowledge, and peer support. Future studies should explore specific interventions to address these challenges and explore the impact of continuous professional growth on CDM in pharmacy practice.

**Disclosure**

None.


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