Pharmacist Prescribing in Community Pharmacy Practice

Submitted in partial fulfilment of the requirements

of the Degree of Doctorate in Pharmacy

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2024

Dedicated to my family for their constant support.

Acknowledgement

I would like to express my deepest gratitude to my advisor, Professor Anthony Serracino Inglott for his constant support and guidance throughout this project.

I would also like to extend my sincere thanks to the Head of Department, Professor Lillian M. Azzopardi and all the staff in the Pharmacy Department for their support, as well as, all participants that have contributed to this research.

I would like to thank my family and friends for their endless encouragement and support.

Abstract

Within a community pharmacy setting, pharmacists are key players within the healthcare ecosystem to ensure equitable access to appropriate, quality and safe use of medications that are specifically meeting the patient's needs. Pharmacist prescribing, within a collaborative practice context, is a means of facilitating timely patient access to healthcare services whilst ensuring safe and rational use of medicines.

The aim of this study was to investigate concerns and benefits of pharmacist prescribing by analysing different pharmacist interventions and identifying scenarios in which pharmacist prescribing should occur.

Patients were recruited within a community pharmacy and divided into two groups based on the presenting complaint. Group A patients were given a pharmacist recommended non-prescription medication. Group B patients were referred to a general practitioner (GP) and the resulting intervention was compared to a hypothetical pharmacist recommended medication if the pharmacist could have prescribing rights. All patients were followed up, where the therapeutic outcome was determined.

One hundred patients were included in the study: 56 patients (Group A) accepted a pharmacist recommended medication and 44 patients (Group B) were referred to a GP. From the Group A patients, 46 patients reported symptomatic relief within the week. From the 10 patients without symptomatic relief, 7 requested a doctor's appointment while 3 opted not to follow up. Twenty-seven patients from Group B, reported symptomatic relief. From the 17 patients with unresolved presenting symptoms: 12

patients opted for a specialist consultation, 3 were admitted to hospital and 2 opted not to follow-up. In 22 cases out of the 44 Group B patients, the pharmacist would have prescribed the same medication as that actually prescribed by the GP. The 22 cases, where prescribing differences between GP and pharmacist occurred, included 4 cases where minor ailments were treated with a broad-spectrum antibiotic by the medical prescriber which was not recommended as first-line treatment, 4 cases of contraindications and 3 cases where medications had no clinical indication.

The outcome of this study indicates concordance in clinical decision making and pharmacotherapy recommendation for prescription medication for 50% of the cases between the medical prescriber and the community pharmacist.

Keywords: pharmacist prescribing, community pharmacy practice, implementation, therapeutic outcome, optimisation

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Glossary

Co-Prescribers	Is any healthcare professional with legal authority to prescribe, who works in a collaborative teamwork with other healthcare professionals who are not authorised to prescribe.
Green Prescription	A prescription which is green in colour and used only to prescribe narcotic and psychotropic substances, which is valid for one month of the issue date and supplies four weeks of medication.
Over-the-counter (OTC) Medications	Any medication that can be purchased without the need for a prescription.
Polypharmacy	A patient using multiple medications simultaneously.
Telepharmacy	Pharmacist interventions being done by telecommunication where the pharmacist consults with the patient virtually.

List of Abbreviations

ACE	Angiotensin-Converting Enzyme
APA	Additional Prescribing Authority
ARB	Angiotensin II Receptor Blockers
BD	Twice a day
BNF	British National Formulary
CCB	Calcium Channel Blockers
CDTM	Collaborative Drug Therapy Management
CHF	Congestive Heart Failure
CMM	Comprehensive Medication Management
CMP	Clinical Monitoring Plan
CP	Collaborative Prescribing
CPA	Collaborative Prescribing Agreement
DM	Diabetes Mellitus
DP	Dependent Pharmacist Prescribing
GERD	Gastroesophageal Reflux Disease
GI	Gastrointestinal
HCP	Healthcare Professionals
IBS	Irritable Bowel Syndrome
ICS	Inhaled Corticosteroid
IHD	Ischemic Heart Disease
IP	Independent Pharmacist Prescribing
LABA	Long-Acting Beta-Agonists
MI	Myocardial Infarction
MTM	Medication Therapy Management
MRA	Mineralocorticoid Receptor Antagonist
MUR	Medication Use Review
NSAID	Non-steroidal anti-inflammatory drugs

OCP	Oral Contraceptive Pill
OD	Once daily
OTC	Over The Counter Medications
POYC	Pharmacy Of Your Choice
PPI	Protein Pump Inhibitor
PRN	Take medication as needed
QDS	Four times a day
SABA	Short-Acting Beta-Agonists
SOB	Shortness of Breath
SP	Supplementary Prescribing
STAT	Taken immediately
TDS	Three time a day
UTI	Urinary Tract Infection

1. Introduction

1.1 The Role of a Community Pharmacist

The pharmacist role within the community pharmacy is an integral part of the healthcare system whereby pharmacists are responsible for the appropriate and safe use of medications (Milosavljevic *et al.,* 2018). This role involves pharmacist providing adequate drug information and counselling on drug therapy, dispensing medications safely, referring to other healthcare professionals (HCP) when needed and carrying out point-of-care testing such as blood pressure monitoring (Milosavljevic *et al.,* 2018).

The role of the pharmacist ensures patient safety and decreases adverse effects, especially of over-the-counter (OTC) medications which patients tend to self administer and assume are safe (Al Mazrouei *et al.,* 2021). Community pharmacists also play a key role in managing patients with multiple conditions or polypharmacy, resulting in increased patient adherence and disease management (Mossialos *et al.,* 2015).

1.2 The Evolution of the Pharmacy Profession

A public perception is that the pharmacy profession has a trivial role within the healthcare system and mostly associate the profession with dispensing of medications (Watson *et al.,* 2020). As sustained by research, pharmacists are highly trained and qualified to respond to the patients' drug and health care needs considering their expert knowledge in pharmacology, hence, pharmacists are underutilised in the healthcare system (Watson *et al.,* 2020; Lott *et al.,* 2021). This is particularly shown in specific instances such as disease outbreaks and/or natural disasters, which overstretch

healthcare resources and prompt evolution and adaptation of healthcare roles, including the pharmacy profession (Watson *et al.,* 2020).

In the United States of America (USA), a pharmacists' role also included screening and testing after anthrax scares and terrorist attacks in 2001 (Watson *et al.,* 2020; Watson *et al.,* 2021). Following Hurricane Katrina in 2005, pharmacists were allowed to prescribe emergency medication for a 30 day period (Watson *et al.,* 2020; Watson *et al.,* 2021). Further events across the globe, pushed the pharmacy profession to adapt, such as the Fort McMurray Wildfire of 2016 in Canada, where pharmacists were needed to provide clinical services including prescribing, assessing and triaging patients (Watson *et al.,* 2020; Watson *et al.,* 2021). The COVID-19 pandemic introduced the increased need for 'telepharmacy' through which pharmacists carried out disease management remotely by using a virtual environment (Baldoni *et al.,* 2019). Pharmacists were also needed for COVID-19 screening and testing, medication research, managing drug supplies and so on (Watson *et al.,* 2021).

1.3 Pharmacist Prescribing Models

Pharmacist prescribing is a professional decision carried out when the pharmacist is competent to prescribe and that this intervention is more beneficial than referring to a doctor (Mills *et al.,* 2020). This strategy allows pharmacists to legally prescribe medications based on various models, including an independent (IP) and dependent (DP) prescribing model (Jebara *et al.,* 2020).

1.3.1 The Independent Pharmacist Prescribing Model

Pharmacists prescribing under the IP model are solely responsible for diagnosing and treating a patient, and managing the outcomes without the need of agreement from a doctor (Ramos *et al*., 2022). This model allows the pharmacist to modify a pre-existing prescription, renew or issue a new prescription all based on a pre-defined list of medications and conditions from which the pharmacist has the ability to prescribe (Ramos *et al*., 2022). This concept is met with greater resistance from doctors, as well as pharmacists who do not feel confident in adding more responsibility (Mills *et al.,* 2020; Raiche *et al.,* 2020).

1.3.2 The Dependent Pharmacist Prescribing Model

Dependent prescribing depends on a partnership built between the prescriber, generally a doctor, and the supplementary prescriber, which is any other HCP, including pharmacists (McCann *et al.*, 2015; Faruquee *et al.*, 2020). Supplementary prescribing (SP) and collaborative prescribing (CP) are both types of dependent prescribing whereby the pharmacist is allowed to select, modify and discontinue medication, along with monitoring the treatment based on prior diagnosis and a written clinical treatment plan (CMP) (Ramos *et al.,* 2022).

The difference between SP and CP is based on the level of responsibility each HCP has. In the SP model, both the independent prescriber and the supplementary prescriber are responsible for the therapeutic outcomes and it is illegal for the supplementary prescriber in this case a pharmacist to prescribe outside of the agreed

CMP (Crawley, 2018). Whilst in the CP model, the responsibility is not shared and each HCP takes on the responsibility for an aspect of the patient treatment. Diagnosis can only be done by an independent prescriber and modification of the CMP by the pharmacist must be reported back to the prescriber (Zhou *et al., 2019)*.

1.4 Pharmacist Prescribing Around the Globe

1.4.1 Pharmacist Prescribing in Malta

Currently, pharmacist prescribing has not been implemented within the Maltese legislation as this would require a reform (Attard Pizzuto *et al.,* 2019). Pharmacists participating in a collaborative framework, generally within a clinical setting, can be considered as 'co-prescribers' as their pharmacological knowledge is used to determine the appropriate treatment plan (Attard Pizzuto *et al.,* 2019).

Local studies have reported on the perceptions of consumers and HCP with regards to pre-established models of pharmacist prescribing and concluded that for the Maltese community aspects of each model should be taken into consideration when a framework is developed (Theuma *et al.,* 2022). Pharmacists perception indicates that a collaborative approach would be preferred (Wirth *et al.,* 2011; Attard Pizzuto *et al.,* 2019). The proposed framework included a dependent prescribing approach and an independent approach for a number of conditions, based on a pre-defined list (Theuma *et al.,* 2022).

1.4.2 Pharmacist Prescribing in the United Kingdom

The United Kingdom first introduced the concept of pharmacist prescribing in 2003, where pharmacists at the time could participate in a collaborative team and prescribe through means of SP (Famiyeh & McCarthy, 2017; Zhou *et al.,* 2019). Three years later, in 2006, IP was implemented in the legislation, and pharmacists where legally allowed to prescribe any drug in the British National Formulary (BNF), excluding off-licensed drugs and controlled substances (McCann *et al.*, 2015, Zhou *et al.,* 2019).

Pharmacists need to obtain a non-medical post-qualification certificate in order to start prescribing. One can apply for this course after at least 2 years of working in patient care including a community or hospital setting. The course entails 26 days of lectures and 12 days of practical experience (Cope *et al.,* 2016).

1.4.3 Pharmacist Prescribing in the United States of America

Pharmacist prescribing in the United States varies between states (Koval *et al.,* 2021). Most states do have a form of DP, also referred as, Collaborative Drug Therapy Management or CDTM, which was first introduced in 1973 (Koval *et al.,* 2021). Similarly to DP, CDTM is based on collaboration between a physician and a pharmacist, generally working in a clinical environment where the physician can delegate tasks to the pharmacist (McBane *et al.,* 2015; Sachsev *et al.,* 2020). Pharmacists are responsible for selecting, initiating, monitoring and adjusting drug treatment, along with administering medications and performing assessments, based on a collaborative

practice agreement (CPA) model produced by the physician which is either patient-specific or population-specific (McBane *et al.,* 2015; Sachsev *et al.,* 2020).

Certain states also allow comprehensive medication management (CMM) or medication therapy management (MTM) which was introduced in 2003, and unlike CDTM, these models do not require a CPA produced by a physician (McBane *et al.,* 2015; Koval *et al.,* 2021). These models generally follow either statewide protocols, where the state decides for which conditions a pharmacist is legally allowed to prescribe, or a class-specific prescribing protocol, which is a form of IP and differs between states (Sachsev *et al.,* 2020).

1.4.4 Pharmacist Prescribing in Canada

Pharmacist prescribing was implemented in Canada in 2007 as a means to increase patient access to healthcare services and enhance therapeutic outcomes (Guirguis *et al.,* 2017; Raiche *et al.,* 2020). Canada is well experienced with pharmacist prescribing, and regulations between provinces differ, with Alberta being the most comprehensive (Guirguis *et al.,* 2017; Ramos *et al*., 2022). Amongst all provinces, pharmacists are allowed to; renew prescriptions, change an existing prescription in terms of drug formulation or dosage, provide 30 day emergency refills, carry out medication reviews, administer injectables and carry out smoking cessation programs (Guirguis *et al.,* 2017; Ramos *et al*., 2022).

Certain regulations require the pharmacist to have an additional prescribing authority (APA) in order to participate in pharmacist prescribing (Guirguis *et al.,* 2017; Faruquee *et al.,* 2020). The APA is obtained through assessment of a detailed application and if granted the pharmacist is allowed to monitor chronic conditions and

initiate or modifying all drugs on the formulary with the exception of narcotic substances (Guirguis *et al.,* 2017; Faruquee *et al.,* 2020; Raiche *et al.,* 2020).

1.5 The Impact on Patient Care

The concept of pharmacist prescribing has been shown to be as effective as prescribing by doctors with better outcomes in terms of patient satisfaction, adherence to medication and quality of life improvements (Cadogan & Hughes, 2021).

Pharmacists are trained to respond to the patients' drug and health care needs considering their expert knowledge in pharmacology, having more control over medications prescribed reduces adverse effects which patients may experience and reducing prescribing errors (McCann *et al.*, 2015; Faruquee *et al.*, 2020; Lott *et al.,* 2021). Studies carried out on pharmacist prescribing have concluded that patients feel more comfortable and are more involved in the decision-making when pharmacists are involved in the treatment plan as consultations are not limited by time, allowing the patient to better understand the condition, resulting in an overall better outcome (McCann *et al.*, 2015; Famiyeh & McCarthy, 2017; Guirguis & Adesanoye, 2018). Pharmacist consultations have the added benefit of taking place at the community pharmacy where it is more convenient for patients and appointments are made freely (Famiyeh & McCarthy, 2017).

Pharmacists have reported improvements in job satisfaction and better use of skills when given prescribing authority, as well as improving the relationship with their patients allowing for a more approachable consultation (McCann *et al.*, 2015; Cope *et al.,* 2016; Jebara *et al.,* 2020).

Studies indicate that minor ailments are the cause of the majority of general practitioner's appointments and visits to the emergency room (Aly *et al.,* 2018). By integrating pharmacist prescribing, countries such as the UK, have reported a reduction in physician workload, as pharmacists are authorised to treat minor ailments such as the common cold or heartburn (Famiyeh & McCarthy, 2017; Cope *et al.,* 2016; Jebara *et al.,* 2020; Tew *et al.,* 2023). Physicians have more time to focus on chronic and urgent conditions, decreasing their waiting lists, along with the burden and costs of the healthcare system, whilst improving patient access (Famiyeh & McCarthy, 2017; Ramos *et al*., 2022).

1.6 Challenges and Concerns

A number of barriers have been identified when implementing pharmacist prescribing, the primary concern is of socio-political context, since support is lacking from authorities resulting in undefined roles that pharmacists with prescribing rights have, lack of awareness of pharmacist capabilities, lack of adequate training and professional skepticism from other medical professionals out of fear of infringement (McCann *et al.*, 2015; Zhou *et al.,* 2019; Raiche *et al.,* 2020). Another concern is due to lack of resources available causing funding concerns and restricted access to patient records (Zhou *et al.,* 2019; Raiche *et al.,* 2020).

A major concern is also the pharmacists' competence to prescribe which can be overcome by proper training and further developing of the diagnostic skill. Pharmacists may be reluctant to apply for prescribing rights due to an increased workload and added responsibility (Ramos *et al*., 2022).

1.6.1 Challenges in Malta

Implementing pharmacist prescribing in a Maltese community setting encounters other challenges namely due to lack of consultation space, the need for more pharmacists and having no access to patient records (Wirth *et al.,* 2011). Within the Maltese community, patients do not always buy medication from the same pharmacy and some patients may be entitled to free medications from the 'Pharmacy of your Choice' (POYC) scheme, which adds complications when trying to view patient records in order to prescribe appropriately (Wirth *et al.,* 2011).

1.7 Research Rationale & Research Question

Recent studies have analysed the benefits and risks regarding the concept of pharmacist prescribing, specifically in countries such as the United Kingdom (UK), Canada and the United States of America (USA). This study design was based on the fact that local studies dealing with this concept is lacking as there is no legal framework in place and it is therefore an opportunity to further evaluate the concept in Maltese community pharmacies, using Malta for an innovative pharmacist prescribing approach.

The rationale for the research was developed to promote pharmacist prescribing within the Maltese community pharmacies. This can be accomplished by further evaluating pharmacist prescribing frameworks in other countries in order to produce a framework which should be used in the Maltese community, as a means to increase patient access to the healthcare system.

The research question developed was; how can pharmacist prescribing be used to enhance patient access within the Maltese community pharmacy setting?

1.8 Aims & Objectives

The aim of this study was to investigate the concerns and advantages of pharmacist prescribing. The objectives included:

- reviewing different types of pharmacist interventions within the community
- comparing the outcomes between a doctor's prescription and a pharmacist recommended medication
- identifying scenarios in which pharmacist prescribing can be used
- identifying the benefits and limitations of pharmacist prescribing.

2. Methodology

2.1 Study Design

A literature review was carried out initially to review different pharmacist interventions within a community pharmacy setting, using databases such as Pubmed® and Hydi to gather relevant studies published in the last 10 years. Keywords used included; “pharmacist prescribing”, “pharmacist intervention”, “supplementary prescribing” and “independent prescribing”.

The study design was divided into two phases, the first phase recruited patients based on a presenting complaint. Patients recruited were divided into two groups; Group A patients were given pharmacist recommended treatment and/or other interventions and Group B patients were referred to a doctor. For Group B patients, the pharmacist prepared a theoretical intervention which was compared to the intervention prescribed by the physician. In the second phase, each patient was followed up after at least one week of recruitment, through means of a telephone interview and each case was analysed to identify any benefits and limitations, as well as the therapeutic outcome.

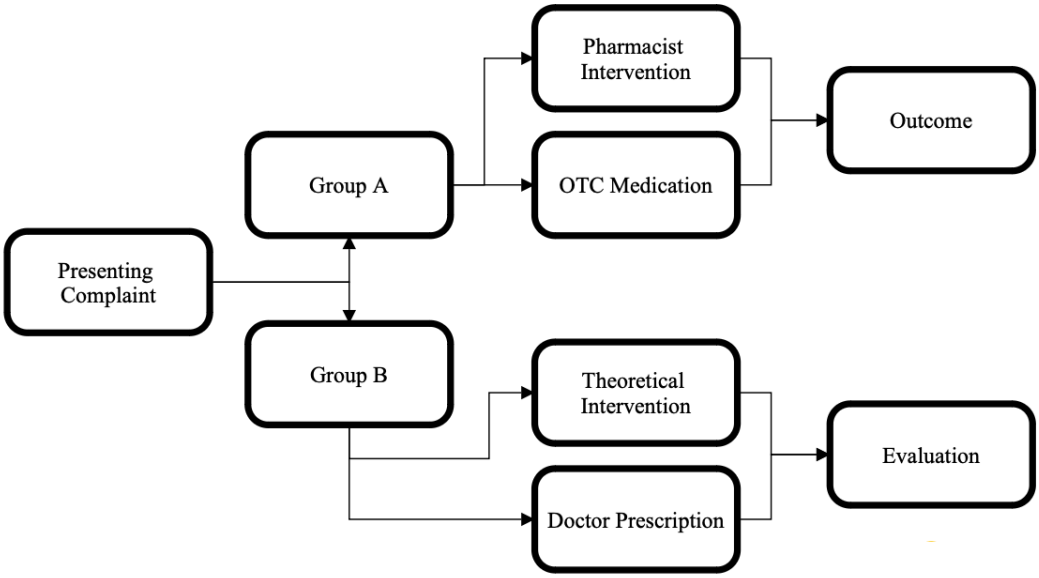

Figure 2.1: Decision Tree for Methodology

2.2 Study Setting

The study design required a community pharmacy setting. Five pharmacies around Malta were selected through convenience sampling. Three pharmacies from the Southern Region, namely Ħal Qormi, Floriana and Marsa were selected, along with one pharmacy from the Central Region and the Northern Region, located in St. Venera and Mellieħa respectively. Each pharmacy was represented by one pharmacist acting as an intermediary. The intermediaries stated that the medications recommended to Group A patients follow the guidelines from the British National Formulary (BNF). The data was collected from each pharmacy over a two-month period, between November 2023 and December 2023.

2.3 Study Approvals

Ethics approval was required prior to the recruitment of patients to the study. The resources developed including the data collection sheet, the semi-structured interview, consent forms and information sheets for patients, five signed consent forms from the intermediaries participating in the study and a dissertation proposal, which were submitted to the Faculty Research Ethics Committee (FREC) and the University Research Ethics Committee (UREC), with reference number UREC-DP2307011MED - MED-2023-00170 (Appendix I).

2.4 Development of Resources

A data collection sheet (Appendix II) was developed to aid the intermediary with recruiting the patients to phase I of the study. Each patient was assigned a number by the intermediary as to ensure anonymity. Patient details such as name, surname, ID card number or any other information which may identify a patient were to be kept solely by the intermediary.

The data collection sheet was divided into two sections. The first section aimed to gather relevant patient characteristics including the sex, age group, any known allergies, past medical history and current medications taken, along with the patient phone number as this was required for the second phase of the study.

The second section of the data collection sheet aimed at guiding the intermediary to divide the recruited patients into either Group A or Group B, based on the presenting complaint. This section gathers all necessary data needed for phase II of the study, clearly marking which group the patient was recruited to, along with the presenting complaint. The intermediary was asked to specify what the pharmacist recommended

product and/or intervention was given to patients recruited to Group A and to specify the medications prescribed by the doctor for patients in Group B.

A semi-structured interview (Appendix III) was developed to be used during phase II of the study, were a telephone interview was held for each patient recruited at least one week after recruitment. This interview was used to determine the therapeutic outcome, and to identify any benefits and limitations associated with pharmacist prescribing.

The semi-structured interview was divided into three sections. The first section was included to verify the presenting complaint and to which group the patient was recruited to. The second section was aimed at gathering information for Group A patients only, and were asked if the intervention provided by the pharmacist resolved the presenting complaint. Patients with a resolved condition ended the interview, while patients with an unresolved condition were asked if a second opinion from a doctor was taken. Patients who went to a doctor after the pharmacist intervention were asked to specify the intervention provided by the doctor, whilst patients not seeking another medical opinion were asked to specify the reason for not going to a doctor and the interview ended with section two. Patients recruited to Group B were asked to skip section two and proceed with section three, which asked the patient if the condition was resolved following a doctors' intervention. Patients with a resolved condition ended the interview, while patients with an unresolved condition were asked if another opinion was taken and to specify the reason for not seeking another opinion, if applicable.

2.5 Validation of Resources

The resources developed were validated through an expert panel consisting of two community pharmacists, two general practitioners and two laypeople. The expert panel were provided with the data collection sheet (Appendix II) and the semi-structured interview (Appendix III) and were asked to provide feedback based on whether the appropriate questions were asked to gather the relevant results for the study. The laypeople were additionally asked to comment on the approachability of the resources.

2.6 Patient Recruitment

The community pharmacies that agreed to take part in the study each had one pharmacist acting as an intermediary. An intermediary information sheet (Appendix IV) was developed and given to each intermediary to explain the aims of the study and the methodology with which patients were recruited. Each intermediary was also asked to sign an intermediary consent form (Appendix V).

The inclusion criteria for the study included patients above 18 years of age and patients needing medical advice in a community pharmacy. The intermediary was supplied with a patient consent form (Appendix VI) and a patient information sheet (Appendix VII), both developed in English and Maltese depending on patient preference. The patient information sheet was used to explain to the patient the aims of the study, the methodology and actions carried out to ensure anonymity. Consenting patients were asked to take part in a five-minute long interview, where the data collection sheet (Appendix II) was filled in by the intermediary and medical advice was

given or patients were referred depending on the patient group recruited to. Approximately one week post recruitment, patients were asked to participate in a telephone follow-up interview with the principal investigator.

2.7 Evaluation of Results

For patients referred to a GP, each case was evaluated and a theoretical prescription was developed by the principal investigator consisting of any medication if the pharmacist had prescribing rights. The theoretical prescriptions were developed by following specific guidelines including the BNF, Global Initiative for Asthma (GINA) and the European Society of Cardiology. Each theoretical prescription prepared was face and content validated by one GP and one community pharmacist, to remove any bias. Following validation, the theoretical prescription and GP prescription were compared for each case individually.

3. Results

This chapter provides results obtained through validation of the resources, outlines patient demographics and cases included in the study.

3.1 Validation of Resources

The data collection sheet (Appendix II) used in phase I of the study, aimed at gathering patient characteristics, the presenting complaint and the pharmacist or doctor intervention, depending on which group the patient was recruited to, was validated by an expert panel consisting of two community pharmacists, two GPs and two laypeople. The expert panel concluded that the data collection sheet (Appendix II) was reliable and effective in gathering relevant results. One community pharmacist proposed an additional question dedicated to identify patients who were using any type of psychotropic or narcotic substances based on the Drugs (Control) Regulations (Cap 31.18[1]). This question was implemented in the final version of the data collection sheet to identify the prevalence of such substances in the population cohort. Patients taking regular narcotic and psychotropic substances have increased access to a physician due to the need of a regular green prescription every four weeks. Both laypeople agreed that the questions asked were easy and proficient.

The expert panel used to validate the data collection sheet, were also asked to validate the semi-structured interview (Appendix III) used in phase II of the study which was needed to determine the therapeutic outcome of each case and concluded that the semi-structured interview was reliable and effective. The laypeople agreed that the questions were easy and not time-consuming.

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[1] Legizlazzjoni Malta. Subsidiary legislation 31.18: Drugs (Control) Regulations [Internet]. Malta: Legizlazzjoni Malta; 1985 [cited 2024 Apr 6]. Available from URL: http://www.justice.gov.mt/eli/sl/31.18

3.2 Patient Demographics

One hundred patients were included in the study, where the five chosen pharmacies recruited 20 patients each based on the presenting complaint. Table 3.1 outlines the patient characteristics.

Table 3.1: Characteristics of Study Participants

Patient Characteristics		**Number of Patients**
Gender	Female	49
	Male	51
Allergies	NKDA	81
	Penicillin	12
	Nuts	1
	NSAIDs	6
Age (in years)	18-24	12
	25-34	24
	35-44	20
	45-54	15
	55-64	9
	65-74	16
	75-84	3
	>85	1
Past Medical History	None	31
Cardiovascular	Arrhythmia	1
	Chronic Heart Failure	5
	Hypertension	35
	Hyperlipidemia	12
	Ischemic Heart Disease	1
	Myocardial Infarction	4
	Stroke	0

Continues on page 22.

Table 3.1: Characteristics of Study Participants Cont.

Patient Characteristics		**Number of Patients**
Respiratory	Asthma	12
	COPD	5
Nervous	Anxiety	11
	ADHD/ADD	2
	Bipolar	0
	Dementia	1
	Depression	8
	Epilepsy	1
	Parkinson’s Disease	0
	Schizophrenia	2
Endocrine	Diabetes Mellitus	21
	Hyperthyroidism	1
	Hypothyroidism	7
Muscoskeletal	Gout	2
	Osteoarthritis	9
	Osteoporosis	4
Other	Chronic Kidney Disease	5
	Gastroesophageal reflux disease	6
	Insomnia	1
	Polycystic ovary syndrome	1
	Allergic Rhinitis	4
	Eczema	1
	Migraines	1

Out of the one hundred patients participating in the study, thirty-one reported no past medical history and among the remaining sixty-nine patients; hypertension (n=35), diabetes mellitus (n=21), asthma (n=12), hyperlipidemia (n=12) and anxiety (n=11) were the most prevalent.

Chronic medications used by the patients were also documented to aid in the informed decision making process. Among the one hundred patients, thirty-three did not use chronic medications. Table 3.2 outlines the chronic medications categorised in the appropriate pharmaceutical classification of the remaining sixty-seven patients.

Table 3.2: Chronic Medications used by Study Participants

Chronic Medications Taken		**Number of Patients**
Cardiovascular	Aspirin	5
	Anticoagulants	5
	ACE inhibitor	21
	ARB	11
	Statins	18
	Calcium Channel Blockers	8
	Diuretics	13
	Beta-blockers	8
	Amiodarone	1
	Nitrates	1
	Fibrates	1
Respiratory	ICS	10
	SABA	13
	LAMA	1
	SAMA	3

Continues on page 24.

Table 3.2: Chronic Medications used by Study Participants (Cont.)

Chronic Medications Taken		**Number of Patients**
Nervous	Benzodiazepines	8
	Antipsychotics	6
	Anti-epileptics	1
	SSRI	11
	CNS Stimulant	3
Endocrine	Insulin	3
	Metformin	19
	SGLT-2	2
	Gliclazide	4
	Gliptins	1
	Thyroxine	7
	Carbimazole	1
Muscoskeletal	Bisphosphonates	4
	Biologics	1
	Allopurinol	2
	Methotrexate	1
Others	Contraceptives	5
	PPI	6
	Alpha-blockers	2
	NSAIDs	3
	Anti-allergy	2

The number of medications used by the sixty-seven patients ranged from 1 to 11 chronic medications daily. On average, the number for medications used daily was 5.

3.2 Patient Recruitment

Fifty-six patients out of the recruited one hundred, accepted a pharmacist recommend medication or a pharmacist intervention and were assigned to Group A. The remaining forty-four patients were referred to a GP and assigned to Group B, as shown in Figure 3.1.

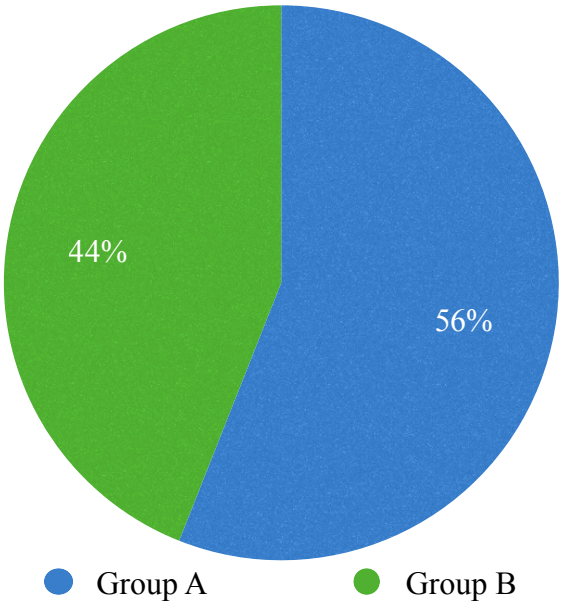

Figure 3.1: Patient Recruitment to Groups

3.2.1 Pharmacist Intervention (Group A) Results

One week after recruitment, patients were contacted again to participate in a telephone interview with the principal investigator to determine the therapeutic outcome. Forty-six patients out of fifty-six group A patients, reported symptomatic relief during the follow-up interview. Among the ten patients with no clinical improvement, seven requested a consultation with the GP, and three opted not to follow-up due to financial constraints or time limitations.

Group A was further divided according to the presenting complaint to analyse more effectively the impact of the pharmacist interventions provided on the therapeutic outcomes, as indicated by Table 3.3.

Table 3.3: Description of Group A Patients

Medical Conditions	**Number of Patients**	
	Symptomatic Relief	***No Symptomatic Relief***
Allergies	9	0
Bacterial Infections	1	1
Cold & Flu Symptoms	8	0
Fungal Infections	5	0
Pain	9	3
Gastrointestinal Disturbances	8	2
Mixed Conditions	6	4
Total:	46	10

The subsequent tables, Table 3.4 through 3.10, show detailed descriptions of each medical condition observed in the study. The tables indicate the presenting complaints reported and the medical condition it was classified as, along with the number of patients with or without symptomatic relief. Details regarding the pharmacist intervention and follow-ups, if applicable, can also be observed.

Table 3.4: Case Description: Allergies

Case 1		
Presenting Complaints:	Frequent sneezing, congestion, watery eyes & headache	
Medical Condition:	Allergic Rhinitis	
No of Patients: 8	***No of Resolved Cases:*** 8	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	- Antihistamine tablets (n=3) - Corticosteroid nasal spray (n=3) - Antihistamine eye drops (n=1) - Decongestant nasal spray (n=4) - Combination of antihistamine and decongestant tablets (n=4)	
Case 2		
Presenting Complaints:	Red painful bump with slight itchiness on arm	
Medical Condition:	Allergic Reaction (due to bee sting)	
No of Patients: 1	***No of Resolved Cases:*** 1	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	- Paracetamol 1g (QDS/PRN) dispensed for pain - Antihistamine cream TDS	

The pharmacist intervention in Case 1 followed the guidelines provided by the British National Formulary (BNF) and dosage form depended on patient preference, past medical history and symptoms experienced. One patient complained of watery and itchy eyes and was dispensed azelastine containing eye drops and cetirizine tablets. Patients complaining of congestion with history of hypertension were not offered a combination product containing a decongestant due to the risk of hypertension and the pharmacist opted for a nasal spray containing xylomethazoline (decongestant) (n=1) or an isotonic salt solution (n=1), along with tablets of cetirizine (antihistamine) (n= 3). Four patients without history of hypertension experienced congestion, and were offered a combination product containing cetirizine (antihistamine) and pseudoephedrine

(decongestant), while two patients opted for xylomethazoline (decongestant) nasal spray for immediate congestion relief. A corticosteroid nasal spray containing triamcinolone acetonide was preferred in three patients with recurrent allergic rhinitis to be used long-term.

The patient in Case 2 was stung by a bee and presented with a painful bump on the arm. The pharmacist noticed no clear signs of severe allergic reaction such as breathing difficulty and dispensed antihistamine cream as the patient preferred to treat topically.

Table 3.5: Case Description: Bacterial Infections

Case 3		
Presenting Complaints:	Right eyelid was itchy, swollen with yellow discharge	
Medical Condition:	Bacterial Conjunctivitis	
No of Patients: 1	***No of Resolved Cases:*** 0	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	- Anti-septic eye ointment - Cleaning lid wipes	
Follow-up of Unresolved Case:	GP prescribed an eye ointment containing an antibiotic and glucocorticoid which resolved the eye infection.	
Case 4		
Presenting Complaints:	Frequent urination and pain during urination in a female patient	
Medical Condition:	Urinary Tract Infection	
No of Patients: 1	***No of Resolved Cases:*** 1	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	- Urinalysis indicated a UTI - Cranberry sachets dispensed	

The patient in Case 3, was given a pharmacist recommended product despite clear signs of infection upon the patient's request. The pharmacist dispensed an eye ointment containing bibrocathol which is an anti-septic and has anti-secretory activity used in the presence of eyelid inflammation to prevent the growth and spread of bacteria.

The patient in Case 4 preferred to be recruited to the pharmacist intervention group due to time limitations associated with making a GP appointment. The pharmacist carried out urinalysis which indicated a lower UTI and cranberry-containing sachets were dispensed to prevent further progression of the infection.

Table 3.6: Case Description: Cold & Flu Symptoms

Case 5		
Presenting Complaints:	Throat pain, chesty or dry cough, fever and congestion	
Medical Condition:	Cold & Flu	
No of Patients: 8	***No of Resolved Cases:*** 8	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	- Paracetamol 1g QDS/PRN (n=2) - Analgesic lozenges (n=2) or throat spray (n=2) - Mucolytic syrup (n=2) - Cough suppressant syrup (n=3) - Decongestant nasal spray (n=3) - Cold & flu tablets (n=4)	

Paracetamol was dispensed to patients who experienced throat pain without signs of congestion. Four patients complained of sore throat and were dispensed an analgesic throat spray or lozenges depending on the patient preference. Two patients experienced a chesty cough and were dispensed carbocisteine (mucolytic). Three patients experienced a dry, irritated cough and were dispensed dextromethorphan (cough suppressant). Patients with symptoms of congestion and no history of

hypertension, were dispensed a preparation containing paracetamol and pseudoephedrine, while, patients with history of hypertension, were dispensed a nasal decongestant, two were given a xylomethazoline spray and one patient an isotonic saline solution. Two patients reported in Case 5, had a history of asthma and were experiencing increased episodes of shortness of breath, thus were encouraged to use salbutamol 200mcg TDS/PRN (patient owned).

Table 3.7: Case Description: Fungal Infections

Case 6		
Presenting Complaints:	Redness and cracking of skin between the toes and on the sole of the feet, burning sensation	
Medical Condition:	Athlete's Foot	
No of Patients: 2	***No of Resolved Cases:*** 2	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	- Clotrimazole (antifungal) spray TDS for 2 weeks - Encouraged the use of foot powder to prevent infection once symptoms resolved	
Case 7		
Presenting Complaints:	Redness and swelling on genitals, thick white discharge	
Medical Condition:	Genital Thrush	
No of Patients: 3	***No of Resolved Cases:*** 3	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	- Clotrimazole (antifungal) cream TDS for 2 weeks - Dual treatment with clotrimazole (antifungal) pessary	

The three patients in Case 7 included two female and one male patient. All patients were dispensed clotrimazole cream to be applied on the affected areas. Dual anti-fungal treatment included the use of clotrimazole cream and a pessary, and was dispensed to both females for internal and external treatment.

Table 3.8: Case Description: Pain

Case 8		
Presenting Complaints:	Severe pain and cramps before and during menstruation	
Medical Condition:	Dysmennorhea	
No of Patients: 2	***No of Resolved Cases:*** 2	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	Naproxen 275mg two tablets STAT, followed by 1 tablet every 12 hours until pain has passed. One patient experienced spasms and was given droteverine (anti-muscarinic) 40mg TDS for 5 days in addition to naproxen.	
Case 9		
Presenting Complaints:	Throbbing pain on one side of the head, sensitivity to light & nausea	
Medical Condition:	Migraine	
No of Patients: 3	***No of Resolved Cases:*** 2	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	Ibuprofen (NSAID) 400mg TDS (n=1) or a combination of 500mg paracetamol with 10mg codeine (n=2) 2 tablets TDS.	
Follow-up of Unresolved Case:	The unresolved case involved a patient who received a combination of paracetamol and codeine. The GP prescribed zolmitriptan 2.5mg STAT, followed by 2.5mg every 2 hours if needed.	
Case 10		
Presenting Complaints:	A shooting burning pain radiating from lower back to leg.	
Medical Condition:	Sciatica	
No of Patients: 1	***No of Resolved Cases:*** 0	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	- Combination of paracetamol and codeine TDS/PRN - Heat cream containing capsaicin TDS - Referred to GP if symptoms remain after 3 days	
Follow-up of Unresolved Case:	Patient opted for no follow-up despite pain due to financial reasons.	

Continues on page 32.

Table 3.8: Case Description: Pain (Cont.)

Case 11		
Presenting Complaints:	Pain and swelling of knee joint, along with stiffness	
Medical Condition:	Joint Pain	
No of Patients: 1	***No of Resolved Cases:*** 1	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	Dexketoprofen 25mg TDS for 7 days to be taken with food was dispensed.	
Case 12		
Presenting Complaints:	Painful, sore and stiff neck or lower back	
Medical Condition:	Muscle Pain	
No of Patients: 5	***No of Resolved Cases:*** 4	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	- Dexketoprofen 25mg sachets TDS for 7 days to be taken with food was dispensed (n=4) - Heat cream TDS (n=1) or heat patch (n=2) - Diclofenac cream TDS (n=2)	
Follow-up of Unresolved Case:	Patient opted for no follow-up despite pain due to time constraints.	

The patient in Case 10, was dispensed a combination of paracetamol and codeine despite an NSAID being first-line in neuropathic pain due to co-morbidities, including hypertension and CHF. The pharmacist originally referred the patient to a GP, however, the patient insisted on being included in the pharmacist intervention group due to financial reasons.

All five patients in Case 12, were dispensed topical treatment including diclofenac (NSAID) cream or heat-stimulating cream or patches, depending on the patients' preference. Dexketoprofen (NSAID) sachets were additionally given to four patients. The unresolved case was not given dexketoprofen sachets due to a history of NSAID allergy and refused to follow-up.

Table 3.9: Case Description: Gastrointestinal Disturbances

Case 13		
Presenting Complaints:	Upper abdominal pain along with a burning sensation	
Medical Condition:	Gastroesophageal Reflux Disease	
No of Patients: 4	***No of Resolved Cases:*** 2	***No of Unresolved Cases:*** 2
Pharmacist Intervention:	- Lifestyle modification advice - Antacids (n=3) containing sodium bicarbonate - Esomeprazole (PPI) 20mg OD (n=1)	
Follow-up of Unresolved Case:	Both unresolved cases received antacid treatment. One case opted for no follow-up due to time constraints and the other was prescribed famotidine 20mg OD by the GP.	
Case 14		
Presenting Complaints:	Passing of hard stools, days passed since last bowel movement	
Medical Condition:	Constipation	
No of Patients: 4	***No of Resolved Cases:*** 4	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	- Lifestyle modification advice - Macrogol OD sachets dispensed (n=3) - Lactulose 15ml OD and glycerin suppository (n=1)	
Case 15		
Presenting Complaints:	Frequent loose stools due to upcoming exam	
Medical Condition:	Anxiety-induced Diarrhea	
No of Patients: 1	***No of Resolved Cases:*** 1	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	Loperamide 4mg STAT followed followed by 2mg after every loose stool to be taken until the exam has passed.	
Case 16		
Presenting Complaints:	Pain in the intestinal region; bloating feeling	
Medical Condition:	Abdominal Pain	
No of Patients: 1	***No of Resolved Cases:*** 1	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	Activated charcoal tablets PRN for bloating and hyoscine (antispasmodic) 10mg TDS for cramping for 3 days.	

The laxatives chosen in Case 14 depended on the presenting complaint. Patients complaining of stools which are hard to pass, were dispensed macrogol (osmotic laxative). Lactulose syrup and glycerin suppository were dispensed to one patient that complained of no bowel movement for the past 2 days.

Table 3.10: Case Description: Mixed Conditions

Case 17		
Presenting Complaints:	Red eyes, stinging and scratching sensation in both eyes	
Medical Condition:	Dry Eyes	
No of Patients: 2	***No of Resolved Cases:*** 2	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	Hydrating eye drops containing hypromellose dispensed	
Case 18		
Presenting Complaints:	Query regarding smoking cessation	
Medical Condition:	Smoking Cessation	
No of Patients: 1	***No of Resolved Cases:*** 0	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	Nicotine Replacement Therapy using chewing gums	
Follow-up of Unresolved Case:	GP prescribed bupropion 150mg OD.	
Case 19		
Presenting Complaints:	Frequent headaches and dizziness	
Medical Condition:	Undiagnosed Condition	
No of Patients: 1	***No of Resolved Cases:*** 0	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	- Blood pressure was found to be over 151/94 - Blood glucose was normal - Lifestyle modifications advice was given and requested to retest blood pressure in 2 days.	
Follow-up of Unresolved Case:	Blood pressure remained high. GP started an ACE inhibitor.	

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Table 3.10: Case Description: Mixed Conditions (Cont.)

Case 20		
Presenting Complaints:	Inability to fall asleep, frequently waking up, feeling tired	
Medical Condition:	Insomnia	
No of Patients: 3	***No of Resolved Cases:*** 2	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	- Doxylamine (sedating antihistamine) (n=2) - Vitamin-preparations containing melatonin, lavender and ashwaganda (n=1)	
Follow-up of Unresolved Case:	GP prescribed an SSRI.	
Case 21		
Presenting Complaints:	Itchy flaky scalp	
Medical Condition:	Dandruff	
No of Patients: 1	***No of Resolved Cases:*** 1	***No of Unresolved Cases:*** 0
Pharmacist Intervention:	Anti-dandruff shampoo dispensed	
Case 22		
Presenting Complaints:	Itchy skin, rash and dry skin	
Medical Condition:	Eczema	
No of Patients: 2	***No of Resolved Cases:*** 1	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	An emollient cream was dispensed	
Follow-up of Unresolved Case:	GP prescribed clobetasol (corticosteroid) TDS cream for 7 days.	

The unresolved case in Case 20 was dispensed a vitamin-preparation instead of a sedating anti-histamine as the patient complained also of feeling anxious which might have contributed to the insomnia.

3.2.2 General Practitioner's Intervention (Group B) Results

Patients in Group B who were referred to a GP, were contacted again one to three weeks after recruitment, to participate in a follow up telephone interview with the principal investigator to determine the therapeutic outcome. Twenty-seven patients out of forty-four reported symptomatic relief. Among the seventeen patients with unresolved presenting symptoms: twelve patients opted for a specialist consultation, three were admitted to hospital and two opted not to follow up due to financial reasons or time limitations.

Group B was further divided according to the presenting complaint to analyse more effectively the impact of the doctor's interventions provided on the therapeutic outcomes, as indicated by Table 3.11. For the purpose of the study, the term 'uncontrolled conditions' includes undiagnosed cases of chronic conditions such as hypertension and exacerbations of a diagnosed chronic condition including congestive heart failure exacerbation.

Table 3.11: Description of Group B Patients

Medical Conditions	**Number of Patients**	
	Symptomatic Relief	***No Symptomatic Relief***
Uncontrolled Conditions	6	4
Drug Adverse Effects	4	2
Pain	3	2
Bacterial Infection	12	1
Fungal Infection	0	2
Gastrointestinal Disturbances	0	2
Vertigo	0	2
Cold & Flu Symptoms	2	0
Allergy	0	2
Total:	27	17

The doctor's prescription for each individual case was compared to a clinical decision and hypothetical pharmacist recommended medication if the pharmacist could have prescribing rights following the appropriate guidelines in each scenario. In twenty-two cases out of the forty-four Group B patients, the pharmacist would have prescribed the same medication as that actually prescribed by the GP. These results were face and content validation through means of focus group discussion including a general practitioner and a community pharmacist. The subsequent tables, Table 3.12 through 3.20, show detailed descriptions of each medication condition observed in the study and indicate the presenting complaint reported, along with the medical condition it was classified as, and past medical history of the patient, where applicable. The tables

include the doctor's prescription, the pharmacist hypothetical recommended medications including the guidelines it was based on and details of the follow-up.

Table 3.12: Case Description: Uncontrolled Conditions

Case 23	
Presenting Complaints:	Dizziness on waking from a laying to a standing position; BP found >110/70 on five different occasions.
Medical Condition:	Orthostatic Hypotension
Past Medical History:	Hypertension, CKD
Medications:	Amlodipine 5mg OD, Empagliflozin 10mg OD, Erythropoietin 4000iu once weekly, Furosemide 40mg TDS, Ferrous fumarate 200mg
Doctor's Prescription:	Loop diuretic reduced from TDS to BD. Continuous blood pressure monitoring recommended.
Pharmacist's Hypothetical Prescription:	Decreasing furosemide dose to 40mg BD (Williams *et al.,* 2018; Rivasi *et al.,* 2020).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief
Case 24	
Presenting Complaints:	Irregular periods, weight gain and fatigue. Recent blood test indicated low levels of T4 and high levels of TSH.
Medical Condition:	Undiagnosed Condition
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Levothyroxine 25mcg daily, blood test to be taken after 4 weeks. First thing in the morning on an empty stomach.
Pharmacist's Hypothetical Prescription:	Levothyroxine 25mcg daily, retesting after 4-6 weeks (Wilson *et al.,* 2021; BNF Section 6.1).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

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Table 3.12: Case Description: Uncontrolled Conditions (Cont.)

Case 25	
Presenting Complaints:	Increased episodes of shortness of breath doing activities of daily-living.
Medical Condition:	Exacerbation of Chronic Condition
Past Medical History:	CHF, Hypertension, Asthma, COPD, GERD
Medications:	Amlodipine 5mg OD, Aspirin 75mg OD, Atorvastatin 80mg NOCTE, Clopidogrel 75mg OD, Doxazosin 2mg OD, Furosemide 40mg OD, Nebivolol 5mg OD, Omeprazole 20mg OD, Umeclidinium 55mcg 1 puff OD
Doctor's Prescription:	Increase furosemide 40mg dose to BD.
Pharmacist's Hypothetical Prescription:	Increase furosemide dose to 40mg BD. Medication review should be carried out once exacerbation is resolved, as an ACE inhibitor and SGLT2 inhibitor are indicated (BNF Section 2.5).
Comparison Rationale:	Agreed
Conclusion:	1 patient without symptomatic relief admitted to emergency care due to increased shortness of breath.
Case 26	
Presenting Complaints:	Increased episodes of shortness of breath, rapid weight gain in the last week and swelling in the ankles.
Medical Condition:	Exacerbation of Chronic Condition
Past Medical History:	Osteoarthritis, Hypertension, DM
Medications:	Bendroflumethiazide 2.5mg OD, Enalapril 20mg OD, Ibuprofen 400mg TDS/PRN, Metformin 500mg TDS
Doctor's Prescription:	Increase bendroflumethiazide dose to 5mg OD
Pharmacist's Hypothetical Prescription:	In the presence of oedema, increase the bendroflumethiazide (diuretic) dose (Williams *et al.,* 2018; BNF Section 2.2).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief.

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Table 3.12: Case Description: Uncontrolled Conditions (Cont.)

Case 27	
Presenting Complaints:	Intense pain in big toe which is red and swollen, third exacerbation in a year.
Medical Condition:	Exacerbation of Chronic Condition
Past Medical History:	GERD, Gout, Hypertension, Hyperlipidemia
Medications:	Allopurinol 100mg OD, Atorvastatin 80mg NOCTE, Fenofibrate 200mg OD, Perindopril 4mg OD
Doctor's Prescription:	Diclofenac 50mg TDS with food and dose increase of allopurinol to 300mg OD.
Pharmacist's Hypothetical Prescription:	Colchicine 500mg QDS for 3 days and allopurinol dose to be increased after acute attack has been resolved (BNF Section 10.1)
Comparison Rationale:	Diclofenac (NSAID) is contraindicated in patients with history of GERD and should be used with caution in patients with hypertension. Colchicine is the preferred option in this case. Increasing the allopurinol dose during an acute attack may further exacerbate gout.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.
Case 28	
Presenting Complaints:	Irregular menstrual cycle and increase in acne.
Medical Condition:	Undiagnosed Condition
Past Medical History:	None
Medications:	None
Doctor's Prescription:	OCP containing 30mcg ethinylestradiol and 3mg drospirenone (Yasmin®)
Pharmacist's Hypothetical Prescription:	OCP containing 30mcg or less of ethinylestradiol and a progestogen (BNF Section 7.3)
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

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Table 3.12: Case Description: Uncontrolled Conditions (Cont.)

Case 29	
Presenting Complaints:	Intense headache, dizziness & blurred vision. BP >140/100 for more than a week.
Medical Condition:	Exacerbation of Chronic Condition
Past Medical History:	Hypertension, Hyperlipidemia, DM
Medications:	Metformin 500mg BD, Rosuvastatin 20mg OD, Valsartan 80mg OD
Doctor's Prescription:	Valsartan 80mg dose increased to BD.
Pharmacist's Hypothetical Prescription:	Increase valsartan (anti-hypertensive) dose (Williams 2018; BNF Section 2.5)
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief
Case 30	
Presenting Complaints:	Increased episodes of shortness of breath doing activities of daily-living with lower limb oedema noticeable.
Medical Condition:	Exacerbation of Chronic Condition
Past Medical History:	CHF, Hypertension, DM
Medications:	Carvedilol 6.25mg BD, Enalapril 20mg OD, Furosemide 40mg OD, Metformin 500mg TDS, Spironolactone 12.5mg OD
Doctor's Prescription:	Furosemide dose increased to 40mg BD and spironolactone dose increased to 25mg OD.
Pharmacist's Hypothetical Prescription:	Increase dose of furosemide (diuretic), spironolactone (M and carvedilol (β-blocker), the latter depending on the hea (Heidenreich *et al.,* 2022; BNF Section 2.5)
Comparison Rationale:	Agreed
Conclusion:	1 patient without symptomatic relief admitted to emergency care due to increased shortness of breath.

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Table 3.12: Case Description: Uncontrolled Conditions (Cont.)

Case 31	
Presenting Complaints:	Increased shortness of breath and a dry wheezing cough. The patient is not complaint to the budesonide inhaler and was using salbutamol frequently.
Medical Condition:	Exacerbation of Chronic Condition
Past Medical History:	Asthma, ADHD
Medications:	Budesonide 200mcg OD, Methylphenidate 10mg BD, Salbutamol 100mcg PRN
Doctor's Prescription:	A combination of 250mcg fluticasone (ICS) and 25mcg salmeterol (LABA).
Pharmacist's Hypothetical Prescription:	Add salmeterol (LABA) and advise proper inhaler u importance [2].
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief
Case 32	
Presenting Complaints:	Increased episodes of shortness of breath and is using salbutamol more frequently.
Medical Condition:	Exacerbation of Chronic Condition
Past Medical History:	Asthma
Medications:	Salbutamol 200mcg TDS/PRN
Doctor's Prescription:	Budesonide 200mcg OD and encourage salbutamol use PRN only.
Pharmacist's Hypothetical Prescription:	Start budesonide 200mcg OD (ICS) [2].
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

[2] Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention. [Internet]. Global Initiative for Asthma; 2023 [cited 2024 Apr 15]. Available from: https://ginasthma.org/gina-reports/

Table 3.13: Case Description: Drug Adverse Effects

Case 33	
Presenting Complaints:	Dry persistent cough mostly occurring at night, present for more than 2 weeks and cough suppressants were not effective.
Past Medical History:	Hypertension, DM , Osteoarthritis
Medications:	Gliclazide 80mg BD, Metformin 500mg TDS, Paracetamol 1g QDS/PRN, Perindopril 4mg BD, Simvastatin 40mg NOCTE
Doctor's Prescription:	Perindopril (ACE inhibitor) discontinued and valsartan (ARB) 80mg BD started.
Pharmacist's Hypothetical Prescription:	Discontinue use of perindopril (ACE inhibitor) if it is not tolerated and switch to valsartan (ARB) (BNF Section 2.5).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief
Case 34	
Presenting Complaints:	Dry persistent cough, present for more than 2 weeks. Cough suppressants and anti-histamines were not effective.
Past Medical History:	Hypertension, DM, Seasonal Allergies
Medications:	Metformin 500mg BD, Perindopril 4mg BD.
Doctor's Prescription:	Perindopril (ACE inhibitor) discontinued and valsartan (ARB) 80mg BD started.
Pharmacist's Hypothetical Prescription:	Discontinue use of perindopril (ACE inhibitor) if it is not tolerated and switch to valsartan (ARB) (BNF Section 2.5).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

Continues on page 44.

Table 3.13: Case Description: Drug Adverse Effects (Cont.)

Case 35	
Presenting Complaints:	Persistent dry cough, cough suppressants were not effective. No shortness of breath present.
Past Medical History:	Hypertension, Asthma
Medications:	Beclomethasone 250mcg OD, Bendroflumethiazide 5mg OD, Perindopril 4mg OD, Salbutamol 200mcg TDS/ PRN.
Doctor's Prescription:	Perindopril (ACE inhibitor) discontinued and valsartan (ARB) 80mg OD started.
Pharmacist's Hypothetical Prescription:	Discontinue use of perindopril (ACE inhibitor) if it is not tolerated and switch to valsartan (ARB) (BNF Section 2.5).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief
Case 36	
Presenting Complaints:	Increased swelling in lower limbs for more than 2 weeks with no changes in diet or medications.
Past Medical History:	Hypertension, DM
Medications:	Amlodipine 5mg OD, Metformin 1g BD, Valsartan 80mg OD
Doctor's Prescription:	Amlodipine (CCB) discontinued and furosemide (loop diuretic) 40mg OD started.
Pharmacist's Hypothetical Prescription:	Discontinue use of amlodipine (CCB) if it is not tolerated and switch to bendroflumethiazide 2.5mg OD (thiazide-like diuretic) (BNF Section 2.5).
Comparison Rationale:	If a CCB is not well tolerated due to the presence of adverse effects, a thiazide-like diuretic is preferred to control the blood pressure and prevent oedema.
Conclusion:	1 patient with symptomatic relief

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Table 3.13: Case Description: Drug Adverse Effects (Cont.)

Case 37	
Presenting Complaints:	Discomfort in the chest region worsening when laying down, nausea and more frequent after meals. Recently has been using ibuprofen more regularly and magnesium-based antacids were not effective.
Past Medical History:	Hypertension, Hyperlipidemia, Osteoarthritis
Medications:	Atorvastatin 20mg NOCTE, Bendroflumethiazide 2.5mg OD, Enalapril 5mg BD, Ibuprofen 400mg TDS/PRN
Doctor's Prescription:	Esomeprazole (PPI) 20mg BD for 7 days to be taken 30 minutes before food.
Pharmacist's Hypothetical Prescription:	Ibuprofen is exacerbating the acid reflux and should be tapered to a lower dose. Patient should be started on long-term treatment with esomeprazole (PPI) (BNF Section 1.1).
Comparison Rationale:	Duration of treatment is short and the triggering factor is not addressed resulting in refractory GERD once treatment is stopped.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.
Case 38	
Presenting Complaints:	Heartburn experienced for more than 2 weeks while using ibuprofen regularly.
Past Medical History:	COPD, Osteoarthritis, GERD
Medications:	Ibuprofen 400mg TDS/PRN, Ipratropium 40mcg BD
Doctor's Prescription:	Calcium carbonate containing antacids TDS/PRN
Pharmacist's Hypothetical Prescription:	Esomeprazole (PPI) 20mg BD indefinitely. Ibuprofen should be tapered to a lower dose (BNF Section 1.1)
Comparison Rationale:	A PPI is indicated as first-line in patients with history of GERD especially in patients with medications that can increase acid reflux such as ibuprofen.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.

Table 3.14: Case Description: Pain

Case 40	
Presenting Complaints:	Severe lower back pain.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Diclofenac cream TDS for 7 days and a combination of diclofenac 75mg and omeprazole 20mg tablets OD for 7 days with food.
Pharmacist's Hypothetical Prescription:	Naproxen 250mg (NSAID) TDS for 7 days with food (BNF Section 4.7)
Comparison Rationale:	Treatment with an NSAID agreed. No indication for omeprazole (PPI) as patient has no history of GERD or peptic ulcer disease.
Conclusion:	1 patient with symptomatic relief
Case 41	
Presenting Complaints:	Severe lower back pain. Paracetamol 1g QDS was not effective.
Past Medical History:	Hypothyroidism, Osteoarthritis, Osteoporosis
Medications:	Alendronic acid 70mg once a week, Glucosamine 1000mg OD, Levothyroxine 75mcg OD
Doctor's Prescription:	Diclofenac cream TDS for 7 days and naproxen 500mg BD for 7 days with food.
Pharmacist's Hypothetical Prescription:	Naproxen 250mg (NSAID) TDS for 7 days with food and esomeprazole 20mg (PPI) OD for 7 days on an empty stomach (BNF Section 4.7)
Comparison Rationale:	Treatment with an NSAID agreed. A PPI would be needed due to an increased risk for GI irritation when combining alendronic acid with any NSAID.
Conclusion:	1 patient without symptomatic relief and no requests for follow-up due to time constraints

Continues on page 47.

Table 3.14: Case Description: Pain (Cont.)

Case 42	
Presenting Complaints:	Pain and stiffness in the neck with movement limitations. Ibuprofen 400mg TDS was not effective.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Etoricoxib 120mg for 7 days with food, diclofenac cream TDS for 7 days and thiocolchicoside 8mg NOCTE for 7 days.
Pharmacist's Hypothetical Prescription:	Naproxen (NSAID) 250mg TDS for 7 days with food and thiocolchicoside 4mg (smooth-muscle relaxant) BD for 7 days (BNF Section 4.7).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief
Case 43	
Presenting Complaints:	A stabbing pain in both knees for the past 12 days, redness and swelling observed.
Past Medical History:	Hypertension, IHD, MI, Hypothyroidism, Osteoarthritis, Rheumatoid Arthritis
Medications:	Aspirin 75mg OD, Atorvastatin 80mg NOCTE, Carvedilol 3.125mg BD, Clopidogrel 75mg OD, Folic acid 15mg once weekly, Glyceryl trinitrate 500mg PRN, Levothyroxine 100mg OD, Methotrexate 20mg once weekly, Omeprazole 20mg BD, Paracetamol 1g TDS/ PRN, Valsartan 160mg BD
Doctor's Prescription:	Diclofenac 50mg sachets TDS for 7-10 days with food.
Pharmacist's Hypothetical Prescription:	Codeine phosphate (Opioid) 30mg TDS and paracetamol 1g TDS for 3 days with food (BNF Section 4.7)
Comparison Rationale:	NSAIDs should not be used in this patient due to the cardiovascular risk factor and the severe drug-drug interaction with methotrexate. A weak opioid does not interact with any medications and is safer.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.

Continues on page 48.

Table 3.14: Case Description: Pain (Cont.)

Case 44	
Presenting Complaints:	Frequent persistent migraines for the past month. Zolmitriptan not as effective as previous times used.
Past Medical History:	Migraines, Seasonal Allergies
Medications:	Cetirizine 10mg OD, Zolmitriptan 2.5mg PRN
Doctor's Prescription:	Amitriptyline 10mg Nocte indefinitely.
Pharmacist's Hypothetical Prescription:	Amitriptyline 10mg NOCTE dose may be increased if tolerated to 25mg NOCTE (BNF Section 4.7).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

Table 3.15: Case Description: Bacterial Infections

Case 45	
Presenting Complaints:	Inflamed right eyelid with yellowish crust.
Past Medical History:	Asthma
Medications:	Budesonide 200mcg OD, Salbutamol 200mcg TDS/PRN
Doctor's Prescription:	Eye drops containing a combination of tobramycin 3mg and dexamethasone 1mg, TDS for 7 days.
Pharmacist's Hypothetical Prescription:	Eye ointment containing a combination of tobramycin 3mg and dexamethasone 1mg TDS for 7 days (BNF Section 11.3).
Comparison Rationale:	Eye ointment is more suitable as a dosage form when the eyelid is affected.
Conclusion:	1 patient with symptomatic relief
Case 46	
Presenting Complaints:	Redness and yellow discharge affecting the left eye only.
Past Medical History:	Anxiety
Medications:	Fluoxetine 20mg OD
Doctor's Prescription:	Eye drops containing a combination of tobramycin 3mg and dexamethasone 1mg, TDS for 7 days.
Pharmacist's Hypothetical Prescription:	Eye drops containing tobramycin 3mg TDS for 7 days (BNF Section 11.3).
Comparison Rationale:	Agreed on treating with an antibiotic. Corticosteroid has no indication.
Conclusion:	1 patient with symptomatic relief

Continues on page 50.

Table 3.15: Case Description: Bacterial Infections (Cont.)

Case 47	
Presenting Complaints:	Moderate pain and swelling on index finger surrounding the nail which started 5 days before.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	A cream containing a combination of fusidic acid and betamethasone TDS for 7 days and ibuprofen 400mg TDS for 7 days after food.
Pharmacist's Hypothetical Prescription:	A cream containing a combination of fusidic acid (antibiotics) and betamethasone (corticosteroid) TDS for 7 days and ibuprofen 400mg TDS/PRN for 7 days after food (Leggit J, 2017).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief
Case 48	
Presenting Complaints:	Inflammation and a small abscess on the thumb surrounding the nail. Abscess was not drained.
Past Medical History:	Hypertension, Hyperlipidemia, Anxiety
Medications:	Atorvastatin 80mg NOCTE, Paroxetine 20mg OD, Perindopril 4mg NOCTE
Doctor's Prescription:	Fucidic acid cream TDS for 7 days and co-amoxiclav 875mg/125mg BD for 7 days after food.
Pharmacist's Hypothetical Prescription:	Fucidic acid cream TDS for 7 days and co-amoxiclav 875mg/125mg BD for 7 days after food (Leggit J, 2017).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

Continues on page 51.

Table 3.15: Case Description: Bacterial Infections (Cont.)

Case 49	
Presenting Complaints:	Red, swollen rash on lower right leg which is itchy and painful with a slight raised border. Patient mentioned falling and cutting herself with a rock.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Cefixime 400mg OD for 8 days after food.
Pharmacist's Hypothetical Prescription:	Flucloxacillin 1g QDS for 7 days after food (BNF Section 5.1). Patient was not penicillin allergic.
Comparison Rationale:	First line treatment is flucloxacillin, if patient is penicillin allergic or is intolerant, clarithromycin or doxycylcine should be used.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.
Case 50	
Presenting Complaints:	Painful abscess on lower back.
Past Medical History:	Hypertension
Medications:	Perindopril 2mg OD
Doctor's Prescription:	Fucidic acid cream BD for 7 days and co-amoxiclav 875mg/125mg BD for 7 days after food.
Pharmacist's Hypothetical Prescription:	Fucidic acid cream TDS for 7 days and co-amoxiclav 875mg/125mg BD for 7 days after food (Leggit J, 2017).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

Continues on page 52.

Table 3.15: Case Description: Bacterial Infections (Cont.)

Case 51	
Presenting Complaints:	Frequent urination and pain during urination in a female patient.
Past Medical History:	Hypertension, Hyperlipidemia, DM
Medications:	Amlodipine 5mg OD, Atorvastatin 40mg NOCTE, Gliclazide 80mg BD, Metformin 1g TDS, Perindopril 4mg BD
Doctor's Prescription:	Nitrofurantoin 50mg QDS for 5 days after food.
Pharmacist's Hypothetical Prescription:	Nitrofurantoin 50mg QDS for 3 days or 100mg BD for 3 days after food (BNF Section 5.1.13).
Comparison Rationale:	Dose duration should be less.
Conclusion:	1 patient with symptomatic relief
Case 52	
Presenting Complaints:	Frequent urination and pain during urination, along with pain in the lower back in a female patient.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Nitrofurantoin 100mg QDS for 7 days after food and cranberry-containing sachets TDS for 2 days.
Pharmacist's Hypothetical Prescription:	Nitrofurantoin 50mg QDS for 3 days or 100mg BD for 3 days after food (BNF Section 5.1.13).
Comparison Rationale:	Dose too high.
Conclusion:	1 patient with symptomatic relief

Continues on page 53.

Table 3.15: Case Description: Bacterial Infections (Cont.)

Case 53	
Presenting Complaints:	Frequent urination and pain during urination, along with pain in the lower back in a female patient.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Ciprofloxacin 500mg BD for 5 days after food.
Pharmacist's Hypothetical Prescription:	Nitrofurantoin 50mg QDS for 3 days or 100mg BD for 3 days after food (BNF Section 5.1.13).
Comparison Rationale:	First line treatment should be with nitrofurantoin. Ciprofloxacin is reserved for upper UTI.
Conclusion:	1 patient with symptomatic relief
Case 54	
Presenting Complaints:	Frequent urination and pain during urination in a female patient.
Past Medical History:	Hypertension, DM
Medications:	Bendroflumethiazide 2.5mg OD, Metformin 500mg TDS, Perindopril 4mg OD
Doctor's Prescription:	Levofloxacin 500mg BD for 5 days after food.
Pharmacist's Hypothetical Prescription:	Nitrofurantoin 50mg QDS for 3 days or 100mg BD for 3 days after food (BNF Section 5.1.13).
Comparison Rationale:	First line treatment should be with nitrofurantoin. Levofloxacin is reserved for prostatitis.
Conclusion:	1 patient with symptomatic relief

Continues on page 54.

Table 3.15: Case Description: Bacterial Infections (Cont.)

Case 55	
Presenting Complaints:	Frequent urination and pain during urination in a male patient. Urinalysis indicated the presence of blood.
Past Medical History:	Depression, Schizophrenia
Medications:	Lorazepam 1mg OD, Risperidone 2mg OD, Sertraline 50mg OD
Doctor's Prescription:	Levofloxacin 500mg BD for 5 days after food.
Pharmacist's Hypothetical Prescription:	Nitrofurantoin 50mg QDS for 7 days or 100mg BD for 7 days after food (BNF Section 5.1.13).
Comparison Rationale:	First line treatment should be with nitrofurantoin. Levofloxacin is reserved for prostatitis.
Conclusion:	1 patient with symptomatic relief
Case 56	
Presenting Complaints:	Chesty cough with green phlem and fever.
Past Medical History:	Arrhythmia, Hypothyroidism, Osteoporosis
Medications:	Alendronic acid 70mg once weekly, Amiodarone 200mg OD, Atenolol 25mg BD, Levothyroxine 25mcg OD, Rivaroxaban 15mg OD
Doctor's Prescription:	Ambroxol syrup (15mg/5ml) 10ml TDS, co-amoxiclav (875mg/125mg) BD with food, salbutamol inhaler 200mcg TDS and fluticasone inhaler 100mcg BD all for 7 days.
Pharmacist's Hypothetical Prescription:	Co-amoxiclav (875mg/125mg) BD with food and carbocisteine syrup (250mg/5ml) 10ml TDS for 7 days (BNF Section 5.1).
Comparison Rationale:	Use of mucolytic and antibiotic agreed. SABA and ICS not indicated in a patient with no history of asthma or COPD, should be used with caution and patient has no symptoms of SOB.
Conclusion:	1 patient with symptomatic relief

Continues on page 55.

Table 3.15: Case Description: Bacterial Infections (Cont.)

Case 57	
Presenting Complaints:	Chesty cough with green phlem and fever.
Past Medical History:	COPD, Hypothyroidism
Medications:	Levothyroxine 25mcg OD, Salbutamol 200mcg BD
Doctor's Prescription:	Ambroxol 150mg tablets OD for 7 days, co-amoxiclav (875mg/125mg) BD for 7 days after food, prednisolone 30mg OD for 3 days after food and an inhaler containing umeclidinium (55mcg) and vilanterol (22mcg) OD.
Pharmacist's Hypothetical Prescription:	Co-amoxiclav (875mg/125mg) BD with food and carbocisteine syrup (250mg/5ml) 10ml TDS for 7 days, prednisolone 30mg OD for 5 days after food, salmeterol 50mcg BD and umeclidinium 55mcg OD (BNF Section 3.1 & 5.1).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

Table 3.16: Case Description: Fungal Infections

Case 58	
Presenting Complaints:	White patch on tongue causing discomfort, dryness and a metallic taste.
Past Medical History:	Hypertension, DM
Medications:	Amlodipine 5mg OD, Metformin 1g TDS, Perindopril 4mg BD
Doctor's Prescription:	Miconazole oral gel BD for 7 days.
Pharmacist's Hypothetical Prescription:	Miconazole oral gel QDS for 7 days after lesions have cleared (BNF Section 5.2).
Comparison Rationale:	Dosage regimen is too short to relieve symptoms.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.
Case 59	
Presenting Complaints:	White patches on tongue causing discomfort.
Past Medical History:	Asthma
Medications:	Budesonide 200mcg BD, Salbutamol 200mcg TDS/PRN
Doctor's Prescription:	Miconazole oral gel TDS for 7 days.
Pharmacist's Hypothetical Prescription:	Miconazole oral gel QDS for 7 days after lesions have cleared (BNF Section 5.2).
Comparison Rationale:	Dosage regimen is too short to relieve symptoms.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.

Table 3.17: Case Description: Gastrointestinal Disturbances

Case 60	
Presenting Complaints:	Frequent abdominal pain and episodes of diarrhoea
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Otilonium bromide 40mg TDS for 7 days and probiotics BD for 7 days.
Pharmacist's Hypothetical Prescription:	Mebeverine hydrochloride (anti-spasmodic) 200mg BD for 7 days, loperamide 4mg STAT followed by 2mg after every loose stool, maximum 16mg daily and a combination of probiotics and electrolytes (BNF Section 1.5).
Comparison Rationale:	Using anti-spasmodic and probiotics agreed. Loperamide is also indicated in cases of IBS. Electrolytes are essential in diarrhoea to prevent dehydration.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.
Case 61	
Presenting Complaints:	Loose stools for the past 3 days and abdominal pain.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Loperamide 4mg STAT followed followed by 2mg after every loose stool for 3 days.
Pharmacist's Hypothetical Prescription:	Mebeverine hydrochloride (anti-spasmodic) 200mg BD for 7 days, loperamide 4mg STAT followed by 2mg after every loose stool, maximum 16mg daily and a combination of probiotics and electrolytes (BNF Section 1.5).
Comparison Rationale:	Using loperamide agreed. An anti-spasmodic, probiotics and electrolytes are also indicated.
Conclusion:	1 patient without symptomatic relief admitted for emergency care due to dehydration.

Table 3.18: Case Description: Vertigo

Case 62	
Presenting Complaints:	Vertigo accompanied with nausea in a 76 year old patient.
Past Medical History:	MI, Gout, Insomnia
Medications:	Allopurinol 100mg OD, Atorvastatin 80mg NOCTE, Carvedilol 3.125mg BD, Clopidogrel 75mg OD, Valsartan 80mg BD, Zolpidem 10mg NOCTE
Doctor's Prescription:	Domperidone 10mg TDS for 7 days and prochlorperazine 5mg TDS for 7 days.
Pharmacist's Hypothetical Prescription:	Cinnarizine (antihistamine) 25mg TDS for 7 days (BNF Section 4.6).
Comparison Rationale:	Antihistamines are first line for treatment of vertigo. Prochlorperazine and domperidone should be used with caution in patients over 60 years.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.
Case 63	
Presenting Complaints:	Vertigo accompanied with nausea in a 44 year old patient.
Past Medical History:	Hypertension
Medications:	Perindopril 4mg OD
Doctor's Prescription:	Cinnarizine 25mg TDS for 7 days
Pharmacist's Hypothetical Prescription:	Cinnarizine (antihistamine) 25mg TDS for 7 days (BNF Section 4.6).
Comparison Rationale:	Agreed
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.

Table 3.19: Case Description: Cold & Flu Symptoms

Case 64	
Presenting Complaints:	Chesty cough and a blocked nose.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Bromhexeine (8mg/5ml) 10ml TDS for 7 days and a combination of ibuprofen 200mg and pseudoephedrine 30mg 2 tablets TDS for 7 days.
Pharmacist's Hypothetical Prescription:	Carbocisteine syrup (250mg/5ml) 10ml TDS for 7 days and a preparation containing pseudoephedrine 30mg (decongestant) and ibuprofen 200mg (analgesic) 2 tablets TDS for 7 days (BNF Section 5.1).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief
Case 65	
Presenting Complaints:	Chesty cough and mild SOB
Past Medical History:	Hypertension, Asthma
Medications:	Fluticasone 500mcg BD, Lisinopril 10mg OD, Salbutamol 200mcg TDS/PRN
Doctor's Prescription:	Ambroxol syrup (15mg/5ml) 10ml TDS for 7 days and use of salbutamol inhaler 200mcg TDS for 7 days.
Pharmacist's Hypothetical Prescription:	Carbocisteine syrup (250mg/5ml) 10ml TDS for 7 days and use of salbutamol inhaler 200mcg TDS for 7 days (BNF Section 5.1).
Comparison Rationale:	Agreed
Conclusion:	1 patient with symptomatic relief

Table 3.20: Case Description: Allergies

Case 66	
Presenting Complaints:	Allergic rash to face cream, on the face, around the left eye causing itchiness and inflammation.
Past Medical History:	None
Medications:	None
Doctor's Prescription:	Cetrizine 10mg NOCTE for 7 days.
Pharmacist's Hypothetical Prescription:	Hydrocortisone butyrate 0.1% BD for 7 days on the affected area only and cetrizine 10mg NOCTE for 7 days (BNF Section 13.5).
Comparison Rationale:	Agreed on the use of an antihistamine. Topical corticosteroids are first-line in contact dermatitis to reduce the inflammation.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.
Case 67	
Presenting Complaints:	Allergic rhinitis
Past Medical History:	Hypertension, DM
Medications:	Lisinopril 10mg OD, Metformin 500mg BD
Doctor's Prescription:	A product containing 5mg loratadine and 120mg pseudoephedrine BD for 7 days.
Pharmacist's Hypothetical Prescription:	Triamcinolone acetonide (corticosteroid) 55mcg nasal spray as 2 sprays in each nostril OD for 7 days then lowered to 1 spray in each nostril OD and desloratadine 5mg NOCTE for 1 month (BNF Section 12.2)
Comparison Rationale:	Agreed on the use of an antihistamine. An oral decongestant should be used with caution in a patient with hypertension. Nasal corticosteroids are first line treatment along with the antihistamine.
Conclusion:	1 patient without symptomatic relief and is waiting for consultant appointment.

4. Discussion

4.1 Current Situation in Maltese Community Pharmacy

The current Maltese legislation prohibits pharmacist prescribing and specifies the role of a community pharmacist as one who dispenses medications and promotes the safe use of prescribed medications, along with carrying out point-of-care tests and referring when needed (Aquilina *et al.,* 2018; Attard Pizzuto *et al.,* 2019).

The main problem faced with implementing pharmacist prescribing within the Maltese legislation, other then professional skepticism, is that a reform of the legislation is needed. Other concerns include lack of space for consultations and limited access to patient records (Wirth *et al.,* 2011; Aquilina *et al.,* 2018; Attard Pizzuto *et al.,* 2019).

Patients with chronic conditions typically receive medications free of charge from the POYC scheme (Wirth *et al.,* 2011). A formulary was put into place to determine what conditions a patient must have to be entitled to a specific medication [3]. Once entitlement is approved by the POYC board, patients receive the medications once every two months from the chosen pharmacy [3]. Prior to the COVID-19 pandemic, patients were required to visit a GP every two months for a general check-up and to collect a prescription needed to obtain medications from the POYC scheme [3]. During the pandemic, the pharmacist was allowed to dispense previously supplied POYC medications without the need of a prescription [3]. This procedure is still in place and shows a pharmacist's ability to renew prescriptions (Theuma *et al.,* 2022).

A digital system has been put into place for easier access to patient records and to implement the concept of 'Medication Use Reviews' (MUR) [3]. MURs are to be carried out by the pharmacist to each patient registered to that specific pharmacy, twice

[3] Government of Malta. The Pharmacy of your choice scheme [Internet]. Malta. [cited 2024 May 05]. Available from: https://healthservices.gov.mt/en/poyc/Pages/Home.aspx

yearly to aid in increasing patient safety by confirming no adverse effects has been experienced, that medications are used appropriately and to refer to a doctor when needed [3].

4.2 Evaluation of Results

Studies have shown that minor ailments, which are defined as any health condition that requires minimal or short-term treatment, are the major cause of GP visits, which impacts the healthcare system negatively, as patients face long waiting times and limits patient access to the healthcare system (Aly *et al.,* 2018; Nakhla *et al.,* 2021). In this study, 48% of patients who received a doctor's intervention had a minor ailment. Patients were referred to a GP by the pharmacist depending on the presenting complaint, co-morbidities and patient preference. Patients who received a pharmacist intervention or pharmacist recommended medication, all had a minor ailment which could be treated with OTC products according to the Maltese legislation.

Certain countries such as the UK, have implemented pharmacist prescribing as a means to deal with minor ailments aiming to improve patient access and decreasing the burden of the healthcare system (Famiyeh & McCarthy, 2017; Cope *et al.,* 2016; Jebara *et al.,* 2020; Tew *et al.,* 2023).

In patients who received a pharmacist intervention, 82% of cases resulted in symptomatic relief, especially incases of fungal skin infections, allergic rhinitis and cold symptoms, where symptomatic relief was achieved in 100% of the cases observed. In

[3] Government of Malta. The Pharmacy of your choice scheme [Internet]. Malta. [cited 2024 May 05]. Available from: https://healthservices.gov.mt/en/poyc/Pages/Home.aspx

patients who received a doctor's intervention, 62% of cases resulted in symptomatic relief.

4.2.1 Identified Pharmacist Prescribing Scenarios

Two scenarios were identified in the pharmacist intervention group as pharmacist prescribing opportunities.

Table 4.1: Pharmacist Prescribing Scenario 1

Case 3		
Presenting Complaints:	Right eyelid was itchy, swollen with yellow discharge	
Medical Condition:	Bacterial Conjunctivitis	
No of Patients: 1	***No of Resolved Cases:*** 0	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	- Anti-septic eye ointment - Cleaning lid wipes	
Follow-up of Unresolved Case:	GP prescribed an eye ointment containing an antibiotic and glucocorticoid which resolved the eye infection.	

The patient in this case was experiencing bacterial conjunctivitis which was clearly indicated by symptoms of inflammation, itchiness and a yellow discharge affecting only one eye [4]. The patient refused referral to a GP due to time constraints and was recruited to the pharmacist intervention group. The pharmacist recommended the use of an anti-septic eye ointment and encouraged eye hygiene, as antibiotic preparations were not allowed to be dispensed without a doctor's prescription. Uncomplicated eye infections typically resolve after a week [4]. If left untreated, a severe infection can result which may cause long-term eye damage [4]. Despite anti-septic

[4] Pippin MM, Le JK. Bacterial Conjunctivitis. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2024 May 12]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK546683/

treatment, the patient started experiencing pain and inflammation increased after one week and had to seek a GP. Pharmacist prescribing in other countries allow prescribing for certain minor conditions such as uncomplicated eye infections (McCann *et al.*, 2015, Zhou *et al.,* 2019). In this case, if the pharmacist was allowed to prescribe first line treatment, according to the BNF, which is chloramphenicol ointment, the eye infection would not have spread, increasing patient safety.

Table 4.2: Pharmacist Prescribing Scenario 2

Case 10		
Presenting Complaints:	A shooting burning pain radiating from lower back to leg.	
Medical Condition:	Sciatica	
No of Patients: 1	***No of Resolved Cases:*** 0	***No of Unresolved Cases:*** 1
Pharmacist Intervention:	- Combination of paracetamol and codeine TDS/PRN - Heat cream containing capsaicin TDS - Referred to GP if symptoms remain after 3 days	
Follow-up of Unresolved Case:	Patient opted for no follow-up despite pain due to financial reasons.	

The patient in this case was experiencing sciatica pain indicated by the shooting burning pain characteristic of neuropathic pain (Aguilar-Shea *et al.,* 2022). The patient requested to be included in the pharmacist intervention group due to financial reasons despite the pharmacist's advice. Neuropathic pain is treated with NSAIDs as first-line, however, the patient had a history of hypertension and CHF, thus NSAIDs were contra-indicated (Aguilar-Shea *et al.,* 2022; BNF Section 4.7.3). The pharmacist chose to dispense a combination of codeine (weak opioid) and paracetamol for immediate pain relief. During follow-up, the patient was still experiencing the sciatica pain, and opted to not consult a physician. Patients with financial problems try to avoid visiting a

physician, which can be highlighted in this case, where the patient was continuously in pain. Studies suggest the use of a muscle-relaxant, tramadol or pregabalin, apart from the highest tolerated dose of NSAIDs (Aguilar-Shea *et al.,* 2022). With pharmacist prescribing implemented, the patient would have been prescribed a muscle-relaxant, along with the analgesics, decreasing the pain.

4.2.2 Comparison of Pharmacist and Doctor's Prescriptions

Patients referred to a GP, were additionally asked to submit a copy of the doctor's prescription. The resulting intervention, was compared to a clinical decision and hypothetical pharmacist recommended medication if the pharmacist could have prescribing rights, based on specific guidelines for each scenario. In twenty-two cases out of the forty-four Group B patients, the pharmacist would have prescribed the same medication as that actually prescribed by the GP.

In the remaining twenty-two cases (Table 4.3), different medications would have been prescribed based on the presenting complaint, past medical history and current medications taken during recruitment. Ten out of twenty-two cases, consisted of the GP not prescribing the first-line medication as suggested by the guidelines. Four of these cases were prescribed a medication which should be contra-indicated, according to the BNF and another four cases consisted of treating the conditions with a broad-spectrum antibiotic. Three out of twenty-two cases, involved prescribing medications without a clinical indication; two were prescribed a topical glucocorticoid and one case was prescribed omeprazole. The remaining nine cases involved the GP prescribing the

wrong dose, wrong duration of treatment, wrong dosage form or where adverse effects were a concern and no action was taken to prevent adverse effects.

Table 4.3: Summary of Compared Prescriptions

Reasons	***No. of Patients***	***Comments***
Drug prescribed not 1st line according to guidelines	10	- 4 patients were prescribed contra-indicated medications - 4 patients were prescribed broad spectrum antibiotics
No clear indication for treatment	3	- 2 patients were prescribed topical corticosteroids - 1 patient was prescribed omeprazole
Preventing adverse effects	4	- PPI were indicated to protect the GIT from medications taken
Wrong duration of treatment	2	- Antibiotic treatment longer than that indicated - PPI treatment shorter than that indicated
Wrong dosage form chosen	1	- Eye drops prescribed for inflammation of eye lids
Wrong dose according to guidelines	2	- 1 patient was prescribed antibiotic dose higher than that indicated

Antibiotic resistance is a global concern and the results of the study indicate that no protocols are in place to decrease resistance, and in fact, patients are prescribed broad-spectrum antibiotics instead of a specific antibiotic which is suggested as first-line, according to the BNF (Attard Pizzuto *et al.,* 2019).

4.3 Proposed Action

The outcome of the study indicated that pharmacists are capable of modifying a drug or changing the dose when needed, especially in cases of adverse effects experienced or exacerbation of an existing condition. The use of dependent pharmacist prescribing allows pharmacists to renew and modify prescriptions of diagnosed conditions (McCann *et al.*, 2015; Faruquee *et al.*, 2020; Ramos *et al.,* 2022). This concept can be implemented within the Maltese community pharmacy setting by allowing pharmacists to modify or renew existing prescriptions for the POYC scheme after consultation with the patient, in order to ensure proper use of medications and to evaluate drug effectiveness. The MURs can be used as a stepping stone in this direction as pharmacists are currently ensuring proper drug use, where a pharmacist with patient consultation is already in place. The outcome of this would result in a decrease in workload for a physician. An increase in patient safety is to be expected, due to the fact that patients are no longer required to visit a GP every two months to collect the POYC prescriptions and are not going for regular check-ups.

One of the concerns of pharmacist prescribing in Malta, is the limited access to patient records (Wirth *et al.,* 2011). The system used to carry out MURs can be modified to allow access to patient records across the Maltese islands, after gaining permission from the patient. A centralised system should be in place prior to implementing pharmacist prescribing, to ensure that the pharmacist can make an informed clinical decision and guarantee accountability, where the intervention would be documented and signed on the patient digital file. The patient digital file should contain the past medical history, allergies and current medications taken, along with any

active prescriptions. This system should be used to implement the use of electronic prescriptions, and would ensure patient safety as all information is stored in a digital manner and can be accessed by all of the patient's healthcare team.

Independent pharmacist prescribing allows the pharmacist to treat minor ailments with any medication from a pre-established list (Ramos *et al*., 2022). The study showed the capability of pharmacists dispensing medication properly in the pharmacist intervention group (Group A) which consisted of minor ailments, and highlighted cases were the patient was unable to consult a physician and the pharmacist could not treat the patient due to legal restrictions.

Protocols should be put into place with regards to prescribing a PPI to ensure patients with history of GERD or chronic use of drugs which may cause GI adverse effects, are protected to promote patient safety.

4.4 Limitations of the Study

Time was a major limitation in the study, where a greater number of patients should have been included given an appropriate timeframe, allowing more pharmacies to participate as well.

Another limitation was limited patient access. Patients referred to a GP may have had a different conversation with the pharmacist gathering data and the prescribing GP, along with lack of vitals taken. This would result in cases where the theoretical pharmacist intervention should have agreed with the GP's prescription.

4.5 Recommendations for Further Studies

A study using more patients and recruiting more pharmacies can be carried out in order to evaluate the outcomes at a greater scale. Patients should be recruited equally to the pharmacist intervention group and doctor's intervention group, and prior classification of presenting symptoms should be put into place to ensure that an equal number of patients suffering with the presenting symptom is evaluated. The outcome of this study should result in a list of conditions that can be used to implement independent pharmacist prescribing.

A pilot study should be carried out at first instance to verify the results obtained from this study, and add to the knowledge of pharmacist prescribing in community. The pilot study should consist of a small number of patients where the pharmacist can consult with each patient and recommend any medication, according to guidelines, which is indicated in that specific scenario.

4.6 Conclusion

The outcome of this study indicates concordance in clinical decision making and pharmacotherapy recommendation for prescription medication for 50% of the cases between the medical prescriber and the community pharmacist. The reasons for disagreement in the prescribing patterns of the GP versus the community pharmacist included:

- Antibiotic resistance
- Contraindications of medications
- Use of steroids topically where not clinically indicated

- Disagreement in dosage forms, strength and duration of treatment
- Lack of prescribing of gastric protection with long-term use of NSAIDs

Signals where pharmacist prescribing frameworks should consider additional patient safeguards include co-morbidities and risks of medications being recommended.

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Appendix I: Ethics Approval

L-Università ta' Malta

Faculty of Medicine & Surgery

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Msida MSD 2080, Malta

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Ref No: MED-2023-00170

25 October 2023

Ms Abigail Buttigieg
70 Manrose,
Dragon Street,
QRM2845, Qormi, Malta

With reference to your application submitted to the Faculty Research Ethics Committee in connection with your research entitled:

Pharmacist Prescribing in Community Pharmacy Practice

The Faculty Research Ethics Committee is granting ethical approval for the above-mentioned application.

Professor Anthony Serracino Inglott
Chair
Faculty Research Ethics Committee

Appendix II: Data Collection Form

Data Collection Form

This form should be completed by the intermediary when interviewing the patient.

Patient Study Number: _____

Section 1: Patient Characteristics

Sex	◯ Male ◯ Female ◯ Other	
Age (years)	◯ 18-24 ◯ 25-34 ◯ 35-44 ◯ 45-54 ◯ 55-64 ◯ 65-74 ◯ 75-84 ◯ >85	
Phone No		
Allergies		
Past Medical History	Cardiovascular	◯ Arrhythmia ◯ Heart Failure ◯Hypertensi ◯ Hyperlipidemia ◯ Ischemic Heart Disease ◯ Myocardial Ischaemia (MI) ◯ Stroke
	Respiratory	◯ Asthma ◯ COPD
	Nervous	◯ Anxiety ◯ ADHD/ADD ◯ Bipolar Disorc ◯ Dementia ◯ Depression ◯ Epilepsy ◯ Parkinson's Disease ◯ Schizophrenia
	Endrocrine	◯ Diabetes Mellitus ◯ Hyperthyroidism ◯ Hypothyroidism
	Muscoloskeletal	◯ Gout ◯ Osteoarthritis ◯ Osteoporosis
	Other *(please specify):*	

Is the patient on any narcotic drugs or psychotropic substances included in the Dangerous Drug Act (DDA)? ◯ Yes ◯ No

	Generic Name	Dose	Dosage Regimen
Current Medications			

Section 2: Patient Group

Patients should be divided into Group A and Group B depending on the presenting complaint. Group A patients are given pharmacist recommended products and/or an intervention. Group B patients are referred to a doctor and any prescription given is to be specified below.

Presenting Complaint	
Recruited to:	◯ Group A ◯ Group B

If the patient is recruited to Group A, please specify what pharmacist recommended product and/or intervention was given.

_____

_____

_____

_____

_____

_____

If the patient is recruited to Group B, please specify what the doctor's prescription included.

_____

_____

_____

_____

_____

_____

_____

Appendix III: Follow-up Interview

Follow-up Interview

This form should be completed after at least one week of recruitment by the Principal Investigator.

Patient Study Number *(should correspond to the intermediary data collecting tool)*:

_____

Section 1: Verifying Patient Group

This section is repeated to verify the presenting complaint that the patient had and to which group the patient was recruited to.

Presenting Complaint	
Recruited to:	◯ Group A ◯ Group B

Section 2

This section should be filled in for patients in Group A only.

Q1. Did the condition resolve with the intervention provided by the pharmacist?
◯ Yes ◯ No

If the answer is 'Yes', the interview is finished.
If the answer is 'No', please continue with this section.

Q2. Did the patient go to a doctor? ◯ Yes ◯ No

If the answer is 'Yes', please continue with Q3a.
If the answer is 'No', please continue with Q3b.

Q3a. Please specify any intervention given by the doctor.

_____

_____

_____

Q3b. Please specify reason for not seeking another medical opinion.

_____

_____

Section 3
This section should be filled in for patients in Group B only.

Q1. Did the condition resolve with the intervention provided by the doctor?
◯ Yes ◯ No

If the answer is 'Yes', the interview is finished.
If the answer is 'No', please continue with this section.

Q2. Do you plan on visiting your doctor again? ◯ Yes ◯ No

If the answer is 'Yes', the interview is finished.
If the answer is 'No', please continue with this section.

Q3. Please specify reason for not seeking another medical opinion.

_____

_____

Comments
Can be filled in for both groups.

_____

_____

Appendix IV: Intermediary Information Letter

Intermediary Information Letter

Dear Pharmacist,

My name is Abigail Buttigieg, and I am currently reading for a Doctorate in Pharmacy at the University of Malta. As part of my course requirements, I am conducting a research study, entitled, "*Pharmacist Prescribing in Community Pharmacy Practice"*. The aim of the study is to explore the concerns and advantages of pharmacist prescribing. Your participation in the study would help us gain a better understanding about pharmacist prescribing. Furthermore, all data collected from this research shall be used solely for the purpose of the study.

You are being invited to act as an intermediary whereby you will be expected to recruit patients through random sampling from a community pharmacy once written consent is obtained from the patient. You will be expected to carry out a 5 minute interview with the patient using the given Data Collection Form. Section 1 of the Data Collection Form contains questions related to patient characteristics, past medical history and current medications taken. Section 2 is used to determine to which group the patient is being recruited to. The presenting complaint of the patient should be specified and patients are recruited to either Group A or Group B.

- Group A patients will be given a pharmacist intervention
- Group B patients will be referred to a general practitioner

For patients recruited to Group A, you will be expected to specify the pharmacist recommended product and/or intervention provided. For patients recruited to Group B, you will be expected to write down the prescription given by the doctor. Each patient should be assigned a code and no written record identifying the patient should be given to the researcher as to ensure anonymity. Any data that can identify the participant must be stored in an encrypted format on your personal computer. The Data Collection Forms will be provided to you and collected within an appropriate timeframe.

Thank you for your time and consideration. Should you have any questions or concerns do not hesitate to contact me on *+35679220698* or by email *abigail.buttigieg.16@um.edu.mt*, or my supervisor Professor Anthony Serracino-Inglott on *+35623402901* or by email *anthony.serracino-inglott@um.edu.mt.*

Abigail Buttigieg	**Professor Anthony Serracino-Inglott**
Researcher	*Research Supervisor*

Appendix V: Intermediary Consent Form

Intermediary Consent Form

Pharmacist Prescribing in Community Pharmacy Practice

I, the undersigned, give my consent to act as an intermediary in the study conducted by Abigail Buttigieg as part of her Doctorate in Pharmacy studies supervised by Professor Anthony Serracino-Inglott (+35623402901). This consent form specifies the terms of my participation in this research study.

1. I have been given written and/or verbal information about the purpose of the study; I have had the opportunity to ask questions and any questions that I had were answered fully and to my satisfaction.

2. I understand that I have been invited to act as an intermediary whereby I am expected to randomly recruit patients from a community pharmacy setting once written consent has been obtained. I am aware that I will be carrying out a 5 minute interview with the patient whilst filling in the Data Collection Form provided.

3. I am aware that I am expected to provide each patient with a unique code. I understand that no personal information identifying the patient is to be given to the researcher as to maintain anonymity.

4. I understand that my participation does not entail any known or anticipated risks.

5. I understand that there are no direct benefits/remuneration to me from participating in this study. I also understand that this research may benefit others by adding knowledge and wisdom to the discussion of pharmacist prescribing.

6. I have been provided with a copy of the information letter and understand that I will also be given a copy of this consent form.

   I have read and understood the above statements and agree to participate in this study.

Name of Pharmacist: _____

Registration Number: _____

Pharmacy Name: _____

Date: _____

Signature: _____

Appendix VI: Participant's Consent Form

Participant's Consent Form (English/Maltese)

Pharmacist Prescribing in Community Pharmacy Practice

I, the undersigned, give my consent to take part in the study conducted by Abigail Buttigieg as part of her Doctorate in Pharmacy studies supervised by Professor Anthony Serracino-Inglott (+35623402901). This consent form specifies the terms of my participation in this research study.

1. I have been given written and/or verbal information about the purpose of the study; I have had the opportunity to ask questions and any questions that I had were answered fully and to my satisfaction.

2. I also understand that I am free to accept to participate, or to refuse or stop participation at any time without giving any reason and without any penalty. Should I choose to participate, I may choose to decline to answer any questions asked. In the event that I choose to withdraw from the study, any data collected from me will be erased as long as this is technically possible (for example, before it is anonymised or published), unless erasure of data would render impossible or seriously impair achievement of the research objectives, in which case it shall be retained in an anonymised form.

3. I understand that I have been invited to participate in a semi-structured interview in which the researcher will ask a series of questions related to my past medical history and current condition to investigate the concerns and advantages of pharmacist prescribing. I am aware that the semi-structured interview will take approximately 5 minutes. I understand that the semi-structured interview is to be conducted in a place and at a time that is convenient for me.

4. I understand that after the interview I will be invited to participate in a follow-up telephone interview carried out by the primary researcher at a time that is convenient for me and which will not be recorded.

5. I understand that the results of this study may be used for medical or scientific purposes, and that the results may be reported or published in medical/scientific conferences or in scientific journals. However, I shall not be personally identified in anyway, either individually or collectively. Data will be treated with confidentiality.

6. I understand that the pseudonmyised data will be stored safely in a locked cupboard available and any data stored on a computer will be in an encrypted

format on a password-protected computer, available only to the researcher, the academic supervisor and the examiner(s) for assessment purposes.

7. I understand that any identifiable data will only be accessed by the pharmacist who is acting as an intermediary and will be stored on his/her personal password-protected computer in an encrypted format.

8. I understand that my participation does not entail any known or anticipated risks.

9. I understand that there are no direct benefits to me from participating in this study. I also understand that this research may benefit others by adding knowledge and wisdom to the discussion of pharmacist prescribing.

10. I understand that, under the General Data Protection Regulation (GDPR) and national legislation, I have the right to access, rectify, and where applicable, ask for the data concerning me to be erased.

11. I understand that all data collected will be erased on completion of the study and following publication of results within 2 years of completion of the study.

12. I have been provided with a copy of the information letter and understand that I will also be given a copy of this consent form.

13. I am aware that extracts from my interview may be reproduced in these outputs, either in anonymous form, or using a pseudonym [a made-up name or code – e.g. respondent A].

    I have read and understood the above statements and agree to participate in this study.

Name of participant: _____

Signature: _____

Date: _____

Formula tal-Kunsens tal-parteċipant/a

Pharmacist Prescribing in Community Pharmacy Practice

Jiena, hawn taħt iffirmat/a, nagħti l-kunsens tiegħi li nieħu sehem fl-istudju ta' Abigail Buttiġieġ bħala parti mil-istudju tagħha fil-kors ta' Dottorat fil-Farmaċija taħt isupervizjoni tal-Professur Anthony Serracino-Inglott (+35623402901). Din il-formola tal-kunsens tispjega t-termini tas-sehem tiegħi f'din ir-riċerka.

1. Ingħatajt l-informazzjoni bil-miktub u/jew bil-fomm dwar l-iskop tar-riċerka; kelli l-opportunità nagħmel il-mistoqsijiet, u kull mistoqsija ngħatajt tweġiba għaliha b'mod sħiħ u sodisfaċenti.

2. Nifhem ukoll li jiena liberu/a li naċċetta li nieħu sehem, jew li nirrifjuta, jew li nwaqqaf il-parteċipazzjoni tiegħi meta nixtieq mingħajr ma nagħti spjegazzjoni jew mingħajr ma niġi penalizzat/a. Jekk nagħżel li nipparteċipa, jaf niddeċiedi li ma nweġibx kull mistoqsija li ssirli. F'każ li nagħżel li ma nkomplix nieħu sehem fl-istudju, l-informazzjoni li tkun laħqet inġabret mingħandi titħassar dment li jkun teknikament possibbli (ngħidu aħna, qabel ma tiġi anonimizzata jew ippubblikata), u sakemm l-għanijiet tar-riċerka jkunu jistgħu jintlaħqu u ma jintlaqtux serjament. F'dak il-każ, l-informazzjoni tiegħi tintuża u tinżamm anonima.

3. Nifhem li ġejt mistieden/mistiedna nipparteċipa f'intervista fejn ir-riċerkatur ħa jistaqsini serje ta' mistoqsijiet li jikonċernaw il-saħħa medikali tiegħi fil-passat u kundizzjonijiet medikali kurrenti biex jinvestigaw zvantaġġi u vantaġġi li kieku l-ispizjara jkollhom l-abilita' li jippreskrivu. Jiena konxju/a li l-intervista se ddum bejn wieħed u ieħor 5 minuti. Nifhem li l-intervista se ssir f'post u f'ħin li huma komdi għalija.

4. Nifhem li wara din l-intervista ħa niġi mistieden/mistiedna nipparteċipa f'intervista oħra li ser iseħ mar-riċerkatura prinċipali, bl-użu tat-telefone u se sir f'ħin li huma komdi għalija u li mhux ħa tiġi rrekordjata.

5. Jiena nifhem li-riżultati ta' dan l-istudju jistgħu jintużaw għal skopijiet kliniċi jew xjentifiċi u jista, jingħata rapport f'konferenzi kliniċi jew xjentifiċi jew jiġu ppubblikati f'ġurnali xjentifiċi. B'ebda mod ma nista' nkun identifikat/a, individwalment jew bħala parti minn grupp. Id-dara se tiġi uzata bil-kunfidenzjalita kollha.

6. Jiena nifhem li d-data se tiġi merfugħa b'mod sigur f'kabinett imsakkar u kwalunkwe data merfugħa fuq il-kompjuter se tkun 'encrypted' fuq kompjuter protett bil-password, disponibbli biss għar-riċerkatura, is-superviżur akkademiku u l-eżaminaturi għal skopijiet ta' valutazzjoni.

7. Jiena nifhem li kwalunkwe data identifikabbli tigi aċċessata biss mill-intermedjajru u se tiġi maħzuna fuq il-kompjuter personali tiegħu/tagħha protett bil-password f'format 'encrypted'.

8. Nifhem li l-parteċipazzjoni tiegħi ma ma fiha l-ebda riskju magħruf jew mistenni.

9. Nifhem li bil-parteċipazzjoni tiegħi f'dan l-istudju, m'hemm l-ebda benefiċċju dirett għalija. Nifhem ukoll li din ir-riċerka jaf tkun ta' benefiċċju għall-oħrajn għax ħa tizdied informazzjoni dwar l-abilita' tal-ispizjara biex jippreskrivu.

10. Nifhem li, skont ir-Regolament Ġenerali dwar il-Protezzjoni tad-Data (GDPR) u l-leġiżlazzjoni nazzjonali, għandi dritt naċċessa, nikkoreġi u, fejn hu applikabbli, nitlob li l-informazzjoni li tikkonċernani titħassar.
11. Nifhem li l-informazzjoni kollha miġbura se titħassar meta jintemm l-istudju u wara li joħorġu r-riżultati f'temp ta' sentejn minn meta jitlesta l-istudju.

12. Ingħatajt kopja tal-ittra ta' tagħrif biex inżommha u nifhem li se ningħata wkoll kopja ta' din il-formola tal-kunsens.

13. Konxju/a li siltiet mill-intervista tiegħi jistgħu jiġu riprodotti b'mod anonimu jew bl-użu ta' psewdonimu [isem ivvintat jew kodiċi - eż. parteċipant A].

Qrajt u fhimt l-istqarrijiet t'hawn fuq, u naqbel li nipparteċipa f'dan l-istudju.

Isem il-parteċipant/a: _____

Firma: _____

Data: _____

Appendix VII: Participant's Information Letter

Participant's Information Letter

Dear Participant,

My name is Abigail Buttigieg, and I am currently reading for a Doctorate in Pharmacy at the University of Malta. As part of my course requirements, I am conducting a research study, entitled, "*Pharmacist Prescribing in Community Pharmacy Practice"*. The aim of the study is to explore the concerns and advantages of pharmacist prescribing. Your participation in the study would help us gain a better understanding about pharmacist prescribing. Furthermore, all data collected from this research shall be used solely for the purpose of the study.

You are being invited to participate in an interview whereby you will be asked about your past medical history and current medications taken, along with the presenting complaint to which you are seeking medical advice. The interview will take approximately 5 minutes and will be held at a time and place most suitable for you. Following the interview, you will be recruited to one of two groups, depending on the presenting complaint.

- Group A patients will be given a pharmacist intervention
- Group B patients will be referred to a general practitioner

Following the appointment with the general practitioner, Group B patients are requested to inform the pharmacist which medications were prescribed. A follow-up telephone interview carried out by the principal researcher (Abigail Buttigieg) will occur after at least one week of recruitment for all patients, where the patient will be asked whether the presenting complaint was resolved or not, and you may be asked to specify reasons for seeking other medical opinions.

You are not obliged to answer all the questions and may withdraw from the study at any time without giving a reason. Furthermore, withdraw from the study will not have any negative repercussions on you, and any data collected will be erased. I can assure you that confidentiality will be maintained throughout the study, and that your identity and personal information will not be revealed in any publications, reports or presentations arising from this research. All data collected will be pseudonymised meaning the transcriptions will be assigned codes by the intermediary. This data may only be accessed by the researcher, the academic supervisor and the examiner(s) for assessment purposes. The data will be stored on the researcher's personal computer that is password protected and in an encrypted format. Any material in hard-copy will be placed in a locked cupboard only available to the researcher. Any data which may identify a participant will be stored securely and separately from any codes accessible only to the intermediary on his/her personal computer that is password protected and in an encrypted format.

Participation in the study is completely voluntary, and you are free to accept or refuse to take part without giving a reason. A copy of the information sheet and consent form will be provided for future reference. As a participant, you have the right under the General Data Protection Regulation (GDPR) and national legislation to access, rectify, and

where applicable ask for the data concerning you to be erased. Once the study is completed and results are published, all data collected will be erased within two years of completion.

Thank you for your time and consideration. Should you have any questions or concerns do not hesitate to contact me on *+35679220698* or by email *abigail.buttigieg.16@um.edu.mt*, or my supervisor Professor Anthony Serracino-Inglott on *+35623402901* or by email *anthony.serracino-inglott@um.edu.mt.*

Abigail Buttigieg	**Professor Anthony Serracino-Inglott**
Researcher	*Research Supervisor*

Formola ta' Informazzjoni għall-Parteċipanti

Għażiż Parteċipant/a,

Jiena Abigail Buttiġieġ, fil-preżent qed insegwi Dottorat fil-Farmaċija fl-Universita' ta Malta. Bħala parti mir-rekwiżiti tal-kors, qed nagħmel riċerka bit-titlu, 'Pharmacist Prescribing in Community Pharmacy Practice'. L-għan ta' dan l-istudju hu li nesplora zvantaġġi u vantaġġi li kieku l-ispizjara jkollhom l-abilita' li jippreskrivu. Is-sehem tiegħek f'dan l-istudju jista' jgħin biex ikollna aktar għarfien dwar l-abilita' li l-ispizjara jippreskrivu. Kull informazzjoni miġbura tintuża biss għall-għan jew l- għanijiet ta' dan l-istudju.

Bħala parteċipant/a inti se tintalab tieħu sehem f'intervista fejn ir-riċerkatur ħa jistaqsini serje ta' mistoqsijiet li jikonċernaw il-saħħa medikali tiegħek tal-passat u mediċini li qed jitieħdu, kif ukoll ilment preżenti li qiegħed/qiegħda tfittex parir mediku għalih. L-intervista se tieħu madwar ħames minuti u se ssir f'post u f'ħin li jkun konvenjenti għalik. Wara l-intervista, inti ħa tkun poġġut/a f'wieħed miż-żewġ gruppi, skond l-ilment preżenti.

- Pazjenti fi'Grupp A ħa jingħataw intervent mill-ispizjar/a
- Pazjenti fi'Grupp B ħa jiġu rreferuti għand tabib tal-familja

Wara l-appuntament mat-tabib tal-familja, pazjenti fi'Grupp B ħa jkunu mitluba jinfurmaw l-ispizjar /a liema mediċini ġew preskritt. Intervista oħra bl-użu tat-telefone mwettqa mir-riċerkatriċi prinċipali (Abigail Buttiġieġ), se ssir min ta' l-inqas ġimgħa wara li tkun tpoġġejt ġo grupp, fejn se tiġi mistoqsi jekk l-ilment għaddilekx jew le, u jaf tkun mitlub/a biex tispeċifika raġunijiet għala tfitxu opinjonijiet oħra medikali.

M'intix obbligat/a li twieġeb il-mistoqsijiet kollha u tista' twaqqaf l-intervista fi xħin trid mingħajr ma tagħti l-ebda raġuni. Dan mhux ħa jkollu riperkussjonijiet negattivi fuqek u l-informazzjoni li tingabar minn għandek titħassar. Nassigurak li se tinżamm il-kunfidenzjalità matul l-istudju kollu u l-identità tiegħek u kull informazzjoni personali miġbura m'huma se jiġu żvelati mkien fit- teżi, ir-rapporti, il-preżentazzjonijiet u/jew il-pubblikazzjonijiet li jistgħu jirriżultaw minnha. Kull tagħrif miġbur se jiġi psewdonomizzat, jiġifieri it-traskrizzjonijiet kollha se jkunu protetti permezz ta' sistema ta' kodiċi li ħa jkun aċċessat biss mil-intermedjarju u miżmuma separatament mill-informazzjoni personali. Ir-riċerkatriċi, is-Superviżur/a akkademiku/a u l-Eżaminatur/i biss ser ikollhom aċċess għall-informazzjoni miġbura u dan bi skop ta' verifika. It-traskrizzjonijiet se jinħażnu fuq il-kompjuter personali tar-riċerkatriċi b'forma ta' data 'encryption' u li hu protett b'password. Barra minn hekk, il-materjal stampat se jinqafel f`post sigur aċċessat mir-riċcerkatriċi biss. Traskrizzjonijiet li jistgħu jidentifikaw partecipant, ħa jkunu maħżuna u mgħarfuha l-bogħod mill-kodiċi fuq il-kompjuter privat tal-intermidjajru, li hu protett b'password u b'form ta' data 'encryption', aċċessat biss mil-intermidjajru.

Il-parteċipazzjoni tiegħek f'dan l-istudju hija għażla għal kollox volontarja u inti ħieles jew ħielsa li taċċetta jew tirrifjuta li tieħu sehem mingħajr ma jkun hemm konsegwenzi fil-konfront tiegħek. Se tingħata kopja tal-ittra ta' informazzjoni u tal-formola ta'

kunsens sabiex tkun tista' taċċessahom fil-futur. Barra minn hekk, skont l-Att Dwar il-Protezzjoni u l- Privatezza tad-Data, inti għandek id-dritt li taċċessa, temenda u tħassar kull informazzjoni li tikkonċernak L-informazzjoni personali kollha se titħassar hekk kif jintemm dan l-istudju ta' riċerka u jkunu ppubblikati r-riżultati miksuba min ta' l-inqas sentejn wara.

Grazzi ħafna tal-ħin u s-sehem tiegħek f'dan l-istudju. F'każ li jkollok xi mistoqsijiet jew tixtieq tiċċara xi ħaġa, tista' ċċempilli fuq *+35679220698* jew tibgħatli email fuq a*bigail.buttigieg.16@um.edu.mt*. Tista' wkoll tikkuntattja lis-superviżur Professor Anthony Serracino-Inglott fuq *+35623402901* jew billi tibgħat email fuq *anthony.serracino-inglott@um.edu.mt.*

Abigail Buttigieg	**Professor Anthony Serracino-Inglott**
Riċerkatriċi	*Superviżur*

Appendix VIII: Dissemination of Study Findings

CERTIFICATE OF ORAL PRESENTATION

82ND FIP WORLD CONGRESS OF PHARMACY AND PHARMACEUTICAL SCIENCES

CAPE TOWN , SOUTH AFRICA

1-4 SEPTEMBER 2024

fip CAPE TOWN 2024 FIP WORLD CONGRESS 1-4 September

THE INTERNATIONAL PHARMACEUTICAL FEDERATION (FIP) HEREBY DECLARES THAT

Ms Abigail Buttigieg

HAS PRESENTED THE FOLLOWING ABSTRACT

"RFMO-1403 - Pharmacist prescribing in community pharmacy practice"

AS AN ORAL PRESENTATION DURING THE 82ND FIP WORLD CONGRESS

Paul Sinclair
President
International Pharmaceutical Federation (FIP)

Mariet Eksteen

Dr Mariet Eksteen
Professional Development and Support
Pharmaceutical Society of South Africa (PSSA)

Abstract Submission for ESCP 2024 Symposium

Clinical pharmacy practice and services in any healthcare setting (including development, evaluation, implementation)

ESCP24SY-1174

ADVANCING COMMUNITY HEALTHCARE: THE INTEGRATION OF PHARMACIST PRESCRIBING

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Background: Pharmacists are key players within the healthcare ecosystem ensuring equitable access to appropriate, quality and safe use of medications optimised to meet individual patient's needs. Pharmacist prescribing, within a collaborative practice context, facilitates timely patient access to treatment.
Aim: The aim of this study was to investigate concerns and benefits of pharmacist prescribing by analysing different pharmacist interventions and identifying scenarios in which pharmacist prescribing is opportune.
Method: Patients were recruited within a community pharmacy and divided into two groups based on the presenting complaint. Group A patients were given a pharmacist recommended non-prescription medication. Group B patients were referred to a general practitioner (GP) and the resulting intervention was compared to a hypothetical pharmacist recommended medication if the pharmacist could have prescribing rights. All patients were followed up, where the therapeutic outcome was determined.
Results: One hundred patients were included in the study: 56 patients (Group A) accepted the pharmacist intervention and 44 patients (Group B) were referred to a GP. From the Group A patients, 46 patients reported symptomatic relief within the week. From the 10 patients without symptomatic relief, 7 requested a doctor's appointment while 3 opted not to follow-up. Twenty-seven patients from Group B, reported symptomatic relief. In 22 cases out of the 44 Group B patients, the pharmacist would have prescribed the same medication as that actually prescribed by the GP. Reasons for disagreement include antibiotic resistance, contraindications of medications in patients with co-morbidities, use of steroids topically when not indicated, lack of prescribing gastro-protective drugs with long-term use of NSAIDs and disagreement in dosage forms, strength and duration of treatment. Broad-spectrum antibiotics were prescribed instead of a specific first-line antibiotic, according to the guidelines, resulting in an increase in antibiotic resistance.
Conclusion: The outcome of this study indicates concordance in clinical decision making and pharmacotherapy recommendation for prescription medication for 50% of the cases between the medical prescriber and the community pharmacist. Signals where pharmacist prescribing frameworks should consider additional patient safeguards include co-morbidities and risks of medications being recommended.
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Disclosure of Interest: None Declared