# AWARENESS, ATTITUDES AND PERCEPTIONS OF DRIVE-THRU COMMUNITY PHARMACY SERVICE DURING COVID-19 AMONG COMMUNITY PHARMACISTS AND GENERAL PUBLIC IN MALAYSIA: A MIXED METHODS STUDY

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## UNIVERSITI SAINS MALAYSIA

## 2024

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by

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**Thesis submitted in fulfillment of the requirements
for the degree of
Doctor of Philosophy**

**April 2024**

# ACKNOWLEDGEMENT

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# LIST OF ABBREVIATIONS

APHM            Association of Private Hospitals of Malaysia

CFA             Confirmatory Factor Analysis

CFI             Comparative Fit Index

COVID-19        Coronavirus infection

CSCSP           Certified Smoking Cessation Service Providers

DALY            Disability-Adjusted Life Years

DCA             Drug Control Authority

EFA             Exploratory Factor Analysis

EPS             Extended Pharmacy Services

HMRs            Home medication reviews

HPRZ II         Hospital Raja Perempuan Zainab II

IFI             Incremental Fit Index

KMO             Using the Kaiser-Meyer-Olkin

MAS             Minor Aliment Service

MOH             Ministry of Health

MPC             Malaysia Productivity Corporation

MPS             Malaysian Pharmacists Society

MAC             Medication Adherence Clinics

NCD             Noncommunicable diseases

NHS             National Health Service

NPCB            National Pharmaceutical Control Bureau

NSUM            National Survey on the Use of Medicines

OTC             Over-the-Counter

QEH             Queen Elizabeth Hospital

R&D             Research and Development

RMSEA          Root Mean Square Error of Approximation

UAE            United Arab Emirates

USM            Universiti Sains Malaysia

VAS            Value Added Services

WHO            World Health Organization

# LIST OF APPENDICES

# KESEDARAN, SIKAP, DAN PERSEPSI TERHADAP PERKHIDMATAN FARMASI KOMUNITI PANDU LALU SEMASA COVID-19 DI KALANGAN AHLI FARMASI KOMUNITI DAN ORANG AWAM DI MALAYSIA: SATU KAJIAN KAEDAH CAMPURAN

## ABSTRAK

Terdapat kurang perhatian terhadap perkhidmatan pandu lalu di farmasi komuniti, terutamanya dalam tempoh COVID-19 di Malaysia. Kajian terdahulu tertumpu kepada perkhidmatan farmasi pandu lalu yang terhad kepada hospital kerajaan atau sebelum COVID-19. Untuk menilai dengan berkesan perkhidmatan farmasi komuniti pandu lalu semasa COVID-19 di Malaysia, adalah penting untuk meneroka persepsi penyedia perkhidmatan (ahli farmasi komuniti) dan orang awam terhadap perkhidmatan ini. Teknik kaedah campuran (kualitatif dan kuantitatif) telah digunakan dalam kerja penyelidikan ini. Dalam fasa kualitatif, temu bual separa berstruktur telah dijalankan di kalangan 25 ahli farmasi komuniti. Analisis tematik kajian kualitatif menghasilkan tujuh tema utama seperti berikut: 1-kebiasaan dengan perkhidmatan farmasi komuniti pandu lalu semasa COVID-19, 2-kesediaan terhadap perkhidmatan ini semasa COVID-19, faedah 3-dilihat ke arah perkhidmatan farmasi komuniti pandu lalu semasa COVID-19, 4-dilihat merugikan terhadap perkhidmatan ini, 5-halangan ke arah perkhidmatan farmasi komuniti pandu lalu, 6-faktor yang mempengaruhi keutamaan terhadap perkhidmatan ini, dan 7-fasilitator kepada perkhidmatan farmasi komuniti pandu lalu. Penemuan utama dari bahagian kualitatif kerja penyelidikan ini adalah bahawa ahli farmasi komuniti melaporkan sikap positif terhadap perkhidmatan farmasi komuniti pandu lalu semasa COVID-19. Walau bagaimanapun, kebimbangan mengenai komunikasi yang lemah antara ahli farmasi

dan pesakit, kaunseling yang terhad, dan kesilapan pendispensan diakui. Bagi fasa kuantitatif, satu tinjauan rentas sempadan negara telah dijalankan untuk meneroka kesedaran, persepsi dan percaya kelebihan dan kekurangan farmasi komuniti pandu lalu di kalangan penduduk umum di Malaysia semasa COVID-19. Seramai 1084 orang awam telah melengkapkan instrumen kaji selidik tersebut. Umur median peserta kajian adalah 50.0 (IQR = 31.0) dan kira-kira separuh daripada mereka adalah lelaki (50.2%, n = 544). Secara ringkas, majoriti telah berkahwin (50.3%, n=545), mempunyai anak (55.5%, n=602), Melayu (93.9%, n=1018), dari Pulau Pinang (17.2%, n=187), mempunyai ijazah sarjana muda (45.5%, n=493), dan bekerja (39.4%, n=427). Analisis statistik maklum balas menunjukkan bahawa orang awam mempunyai kesedaran, sikap, dan persepsi positif terhadap perkhidmatan farmasi komuniti pandu lalu semasa COVID-19 di Malaysia. Mereka percaya perkhidmatan tersebut membantu semasa COVID-19 45.8% (n=497), untuk meningkatkan penjarakan sosial dan mengurangkan penyebaran virus COVID-19 47.8% (n=518). Antara faktor sosiodemografi, warganegara bukan warganegara Malaysia (p<0.001), dan berumur 55 tahun ke atas (p=0.01) didapati memberi kesan negatif terhadap persepsi peserta terhadap perkhidmatan farmasi komuniti pandu lalu. Kesimpulannya, tesis ini memberi penerangan tentang kesan pelaksanaan farmasi pandu lalu di Malaysia semasa COVID-19, termasuk sikap, kesedaran, kelebihan dan kekurangan yang dirasakan, dan halangan terhadap pelaksanaannya, seperti yang dinyatakan oleh ahli farmasi komuniti dan orang awam. Adalah penting untuk mewujudkan perkhidmatan ini dengan menyeragamkan garis panduan untuk farmasi pandu lalu yang mempertimbangkan semua halangan, kebimbangan, dan faktor yang dapat mempengaruhi pelaksanaan perkhidmatan ini.

# AWARENESS, ATTITUDES AND PERCEPTIONS OF DRIVE-THRU COMMUNITY PHARMACY SERVICE DURING COVID-19 AMONG COMMUNITY PHARMACISTS AND GENERAL PUBLIC IN MALAYSIA: A MIXED METHODS STUDY

## ABSTRACT

There is a lack of attention to drive-thru services in the community pharmacy setting, particularly during the COVID-19 period in Malaysia. Previous studies focused on the drive-thru pharmacy services limited to the government hospitals or before COVID-19. To effectively assess the drive-thru community pharmacy service during COVID-19 in Malaysia, it is essential to explore the perceptions of service providers (community pharmacists) and the general public towards this service. Mixed methods techniques (qualitative and quantitative) were used in this research work. In the qualitative phase, semi-structured interviews were conducted among 25 community pharmacists. Thematic analysis of the qualitative study yielded seven major themes as follows: 1-familiarity with drive-thru community pharmacy service during COVID-19, 2-willingness toward this service during COVID-19, 3-perceived benefits toward drive-thru community pharmacy service during COVID-19, 4-perceived disadvantages toward this service, 5-barriers toward drive-thru community pharmacy service, 6-factors affecting the preference toward this service, and 7-facilitators to drive-thru community pharmacy service. The major findings from the qualitative part of this research work are that community pharmacists reported positive attitudes toward drive-thru community pharmacy service during COVID-19. However, concerns about poor communication between the pharmacist and the patient, limited counseling, and dispensing errors were acknowledged. For the

quantitative phase, a cross-sectional nation-wide survey was conducted to explore the awareness, perceptions and believed advantages and disadvantages of drive-thru community pharmacies among the general population in Malaysia during COVID-19. A total of 1084 of the general public completed the survey instrument. The median age of study participants was 50.0 (IQR = 31.0) and about half of them were males (50.2%, n = 544). Briefly, the majority were married (50.3%, n=545), had children (55.5%,n=602), Malay (93.9%, n=1018), from Penang (17.2%, n=187), had a bachelor's degree (45.5%, n=493), and were employed (39.4%, n=427).The statistical analysis of the responses showed that the general public had positive awareness, attitudes, and perceptions toward drive-thru community pharmacy services during COVID-19 in Malaysia. They believed those services were helpful during COVID-19 45.8% (n=497), to enhance social distancing and reduce the spread of the COVID-19 virus 47.8% (n=518). Among sociodemographic factors, non-Malaysian nationality (p<0.001), and age above 55 years (p=0.01) were found to negatively affect participants' perceptions towards drive-thru community pharmacy services. In conclusion, this thesis sheds light on the impact of implementing drive-thru pharmacies in Malaysia during COVID-19, including the attitudes, awareness, perceived advantages and disadvantages, and barriers to its implementation, as expressed by community pharmacists and the general public. It is crucial to establish these services by standardizing guidelines for drive-thru pharmacies that consider all perceived barriers, concerns, and factors that could affect implementing this service.

# CHAPTER 1

# INTRODUCTION

## 1.1   Introduction

This chapter summarises the introduction of this research, along with the statement of research problems. It also presents the study questions and objectives. Finally, it provides an overview of this thesis.

Coronavirus infection (COVID-19) is a contagious infection caused by the SARS-CoV-2 (World Health Organization, 2020). Several sectors, including those in economics, education, tourism, social, industrial, transportation and healthcare, were significantly impacted by COVID-19 (Shivalkar et al., 2021). World Health Organization (WHO) declared that approximately three million deaths were attributed to COVID-19 (World Health Organization, 2021). Negative impacts on patients, healthcare systems and healthcare providers were noticed during COVID-19 (Sabetkish & Rahmani, 2021). COVID-19 negatively provoked various healthcare conditions, such as cardiovascular (Long et al., 2020), endocrine (Auriemma et al., 2021; Graf et al., 2021; Schofield et al., 2020), gastroenterology (Bajaj et al., 2021; Rutter et al., 2021; Sarin et al., 2020), oncology and haematology (Beerkens et al., 2020; Bertuzzi et al., 2021; de Sanctis et al., 2020; Dinmohamed et al., 2020), nephrology (Hassanein et al., 2020) and psychology conditions (Amsalem et al., 2021). Since the onset of the COVID-19 pandemic, the World Health Organization (WHO) has issued numerous safety measures aimed at mitigating the transmission of the virus to the greatest extent feasible. One of the preventive measures implemented was the practice of social distancing, which is maintaining a minimum distance of one meter between two individuals (World Health Organization, 2019).

Mandatory lockdowns and fear of being infected changed physical ways of getting daily life essentials for more safe ways (Bonotti & Zech, 2021). Those ways mainly require less or no physical contact, such as online shopping or drive-thru services (Mofijur et al., 2021; Nicola et al., 2020). The drive-thru pharmacy approach has emerged as a viable option for implementing social distancing measures, particularly in response to the COVID-19 pandemic (Ngo et al., 2021).

The concept of a drive-thru is characterised by the provision of services to individuals without requiring them to exit their automobiles (The Free Dicitonary, 2014). Some examples about drive-thru services are in food and beverages service, banking, and pharmacies (Hollan, 2020). The literature review sheds light on the implementation of drive-thru pharmacy services in various countries, including the US, the UK, Croatia, Malaysia, Jordan, Australia, Taiwan and Qatar, among others (Hussain et al., 2021; Jacqueline A. Padilla & Erwin M. Faller, 2022).

The use of drive-thru pharmacy service has been motivated by various factors, including the desire to minimise waiting periods, enhance the accessibility of pharmaceutical services for specific demographics and, most recently, enhance safety measures in light of the COVID-19 pandemic (Hussain et al., 2021). The Walgreens pharmacy in the US introduced the first drive-thru pharmacy service during the 1990s with the intention of catering to elderly individuals who may have limited mobility (Myers A., 2011). Furthermore, drive-thru pharmacy services were introduced in the UK and Croatia with the aim of catering to the needs of older adults and parents with young children (James Tozer For The Daily Mail, 2008; Times, 2017).

In 2003, the Ministry of Health Malaysia's Pharmaceutical Services Division implemented a drive-thru pharmacy service as part of their Pharmacy Value Added Services (VAS) (Loh et al., 2017). The establishment of the first drive-thru pharmacy service in Malaysia took place in 2008 as part of a trial project. This service was introduced at Pulau Pinang in Penang General Hospital (Che Noriah O et al., 2010). According to a report by the Pharmaceutical Services Division of the Ministry of Health Malaysia in 2014, the implementation of drive-thru pharmacy services at 18 hospitals and 18 health clinics aimed to address parking challenges and alleviate congestion in the pharmacy waiting area (Pharmaceutical Services Division, 2014). Two hospitals in Malaysia, namely Queen Elizabeth Hospital (QEH), Kota Kinabalu (Liew et al., 2020) and Hospital Raja Perempuan Zainab II (HPRZ II) (Azmi, Nazmi Liana, 2015), were identified as providers of drive-thru pharmacy services.

In addition, the provision of time-saving pharmacy services has been implemented by the drive-thru pharmacy Griff in Australia since 2010 (Griffith, 2010) Similarly, studies conducted in Jordan (Abu Hammour et al., 2019) and Taiwan (Lin et al., 2013) have demonstrated that drive-thru pharmacy services provide expedited pharmaceutical services in comparison to conventional pharmacy services (Abu Hammour et al., 2019; Lin et al., 2013). The primary objective of the implementation of drive-thru pharmacy services during the COVID-19 pandemic was to prioritise the safety of pharmacists and consumers (Joseph Jones, 2020). An instance of this can be observed in Sidra Medicine, located in Qatar, where the implementation of a drive-thru pharmacy service was introduced. The service aims to facilitate the dispensing of pharmaceuticals, specifically at the outpatient building (The Peninsula Online, 2020).

In addition, the implementation of a drive-thru pharmacy service was introduced by Thumbay University Hospital in the United Arab Emirates (UAE) with the aim of reducing the transmission of COVID-19 and encouraging adherence to social distancing measures (Khaleej Times, 2020).

According to the chairman of the Malaysian Pharmacy Association, the provision of drive-thru pharmacy service is deemed essential and imperative amidst the COVID-19 pandemic (Hazira Ahmad Zaidi, 2022). The Superbig Kubang Kerian Pharmacy, located in Kelantan, Malaysia, has the distinction of being the first community pharmacy to provide a drive-thru service, commencing operations on the 5th of February, 2022 (Hazira Ahmad Zaidi, 2022). The implementation of this measure aimed to promote social distance and reduce the need for in-person visits to hospitals and clinics, thereby alleviating the burden on hospital pharmacies (Hazira Ahmad Zaidi, 2022).

Additionally, in response to the COVID-19 pandemic, it became imperative to provide drive-thru pharmacy services to the community in Saudi Arabia, as highlighted by Diri (2020). According to Padilla and Faller (2022), the COVID-19 pandemic resulted in notable economic implications for pharmaceutical services. The increased demand for drugs necessitated heightened sales and manufacturing efforts. Additionally, clients expressed a strong preference for expedited pharmaceutical services, including drive-thru service. Consequently, the acquired experiences derived from the use of drive-thru pharmacies during the COVID-19 pandemic across several nations may serve to advocate for the advantages that may be derived from the implementation of these services via the establishment of standardised worldwide protocols for drive-thru pharmacies (Hussain et al., 2021). The evaluation of pharmacy services may be conducted by evaluating their quality, which involves

the judgement of regulatory bodies, customers and service providers (Christensen & Penna, 1995)). The evaluation of patients' views towards healthcare services serves as an important indication for assessing the effective implementation of such services (Boudreaux & O'Hea, 2004; Saiboon et al., 2008). In order to assess the quality of pharmacy services, it is necessary to take into account the viewpoints of pharmacists on the services rendered (White & Klinner, 2012).

## 1.2 Statement of research problems

As a result of mandatory lockdown measures and concerns over COVID-19 infection, individuals in various countries, such as Brazil, China, Germany, Italy, the Republic of Korea, the Russian Federation, South Africa, Switzerland, Turkey, and the UAE, have been compelled to fulfil their needs, including the acquisition of medicines, through online platforms (Jairoun et al., 2021; United Nation Conference on Trade and Development, 2020). Alternatively, in certain countries like Malaysia, individuals have resorted to utilising drive-thru services for their pharmaceutical requirements (Hazira Ahmad Zaidi, 2022; Hussain et al., 2021; Jacqueline A. Padilla & Erwin M. Faller, 2022). The implementation of drive-thru pharmacy services has been observed in various countries, encompassing hospital and community settings, with the aim of enhancing the delivery of pharmaceutical services to specific populations. These services have been designed to offer expedited assistance, alleviate parking difficulties, and, more recently, comply with safety protocols in response to the COVID-19 pandemic (Hussain et al., 2021). The quality assessment of healthcare services, including pharmacy services, can be determined by the service consumers or and service providers (Christensen & Penna, 1995) by investigating their perceptions toward that service (Boudreaux & O'Hea, 2004; Saiboon et al.,

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2008; White & Klinner, 2012). In the Malaysian healthcare system, patients' satisfaction with any provided healthcare service is considered as a key to successful service instilling (Saiboon et al., 2008).

The literature review spotted light on the limited studies that evaluated drive-thru pharmacy service by investigating either pharmacists' (Abu Farha et al., 2017; Lee & Larson, 1999) or public perceptions (Abu Hammour et al., 2019; Azmi, Nazmi Liana, 2015; Che Noriah O et al, 2010; Diri, 2020; Lee & Larson, 1999; Liew et al., 2020). In the preceding decade, there have been only two cross-sectional studies documented in the literature that examined attitudes toward drive-thru community pharmacy service prior to the onset of the COVID-19 pandemic. The first study focused on customer perspectives and was conducted by Abu Hammour et al. (2019), while the second study explored the viewpoints of pharmacists and was carried out by Abu Farha et al. (2017) in Jordan. Additionally, cross-sectional research conducted in Saudi Arabia examined the views of customers towards drive-thru community pharmacy services during the COVID-19 pandemic. Nevertheless, it is important to acknowledge that the findings of this particular study may have limited generalisability due to its exclusive focus on Saudi Arabia as the research setting (Diri, 2020).

In Malaysia, only two studies evaluated drive-thru pharmacy service through service consumers' perceptions (Azmi, Nazmi Liana, 2015; Liew et al., 2020). However, these studies were conducted in hospital settings at Queen Elizabeth Hospital (Liew et al., 2020) and Raja Perempuan Zainab II Hospital (Azmi, Nazmi Liana, 2015) before COVID-19. On the other hand, the process of ordering and picking up drive-thru pharmacy orders varies from pharmacy to pharmacy and from country to country as well (Abu Farha et al., 2017; Hazira Ahmad Zaidi, 2022;

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Saiboon et al., 2008; Walgreens Newsroom, 2020). Hence, it is crucial now to determine the aspects that contribute to the drive-thru community pharmacy service in Malaysia. Furthermore, there is still a lack of research investigating the perspectives of community pharmacists and the general people about the significance of drive-thru community pharmacy service during the COVID-19 pandemic in Malaysia. Understanding the perspectives of both community pharmacists and the general public is crucial for examining the current state of drive-thru community pharmacy services and identifying necessary measures to enhance their implementation in the community setting. This research was therefore formulated to examine the perspective of community pharmacists and the general people about drive-thru community pharmacy service in Malaysia during the COVID-19 pandemic. Semi-structured interviews were undertaken with community pharmacists to obtain a more comprehensive grasp of their viewpoints. Subsequent to the analysis of the qualitative data, further research was conducted using a quantitative methodology among the general population.

This research aims to provide policymakers with a novel perspective on the effects of implementing drive-thru community pharmacies in Malaysia. Specifically, it will examine the overall perception about drive-thru community pharmacies among community pharmacists and the general public.

Additionally, this study intends to identify potential barriers and facilitators for the implementation of drive-thru pharmacy services in the community. It seeks to shift the perception of community pharmacists and the general public towards fostering a stronger demand and acceptance of this service in the future.

In behavioural sciences and health service research, a mixed methodology approach is typically recommended and is becoming more widely recognised as an effective methodology. This methodology combines quantitative and qualitative methods so that they can each benefit from their benefits (Curry et al., 2009; Sale et al., 2002). This method combines the use of two distinct approaches to data collection and analysis within a single study: a quantitative approach involving structured data collection and statistical analysis (Creswell, 2011; Johnson & Onwuegbuzie, 2007; Mills, 2012) and a qualitative approach involving less structured data collection and thematic analysis.

For the purpose of providing a more thorough understanding of the phenomenon of interest (including its context) and increasing confidence in the conclusions drawn from the evaluation study, a mixed-method study intentionally juxtaposes or combines qualitative and quantitative methods (Caracelli & Greene, 1993).

## 1.3    Research questions

This research aimed to answer the following research questions:

i)    Is the general public and community pharmacists in Malaysia familiar with the concept of a drive-thru community pharmacy?

ii)   What are the attitudes towards drive-thru community pharmacy service in Malaysia among community pharmacists and the general public during COVID-19?

iii)     What are the advantages and disadvantages towards drive-thru community pharmacy service among community pharmacists and the general public in Malaysia during COVID-19?

iv)     What are the socio-demographic factors affecting the general population's perception in Malaysia towards drive-thru community pharmacies among community pharmacists and the general public?

v)     What are the barriers towards drive-thru community pharmacy service among community pharmacists in Malaysia?

vi)     What are the facilitators towards drive-thru community pharmacy service among the community pharmacists in Malaysia?

## 1.4    Research objectives

### 1.4.1    General objectives

The objective of this research is to examine the awareness, attitudes, and perceptions of community pharmacists and the general population in Malaysia about drive-thru community pharmacy service during COVID-19.

### 1.4.2    Specific objectives

i)      To explore the awareness and attitudes of community pharmacists toward drive-thru community pharmacy service in Malaysia during COVID-19 using qualitative study,

ii)     To assess the acceptance of introducing the drive-thru service at community pharmacies among the community pharmacists,

iii)    To identify socio-demographic factors affecting the general population's perception towards drive-thru community pharmacy service from the point of view of the community pharmacists,

iv)    To explore community pharmacists' perspectives on possible barriers and facilitators toward drive-thru community pharmacy service during COVID-19 in Malaysia,

v)     To develop and validate English and Malay tool versions to evaluate the public's perceptions of drive-thru community pharmacy services in Malaysia using modern test theory, that is, Confirmatory and Exploratory Factor Analysis,

vi)    To determine the awareness, perceptions, and perceived advantages and disadvantages of drive-thru community pharmacies among the general population in Malaysia during COVID-19,

vii)    To identify socio-demographic factors affecting the perceptions and use of drive-thru community pharmacy service in Malaysia among the general public,

## 1.5    Overview of the thesis

The present study is structured into two distinct stages, namely qualitative and quantitative. The qualitative portion of this thesis, specifically outlined in Chapter 3, was the implementation of a study using semi-structured interviews. A total of 25 community pharmacists were selected as participants in this research endeavour. The subsequent stage of this research project included Chapter 4, which delineates the quantitative surveys conducted to examine the perspectives of the overall populace about drive-thru community pharmacy service in Malaysia. These surveys were administered in both English and Malay languages. A sample size of 1400 persons was selected, and 1084 participants responded to the two questionnaires.

However, before the empirical investigation conducted in this thesis, a comprehensive evaluation of the existing literature was undertaken in Chapter 2. The discourse starts with an examination of the evolutionary trajectory of the pharmacy profession. Subsequently, an exposition on the evolution of pharmaceutical care practice is presented, which is then succeeded by an examination of the societal aspects pertaining to the field of pharmacy. The following chapter provides a comprehensive examination of the progression of the function undertaken by pharmacists. Subsequently, a concise examination of the healthcare system in Malaysia is presented. The chapter provides an overview of the drive-thru pharmacy service, both on a worldwide scale and specifically in the context of Malaysia.

Subsequently, an examination is undertaken to explore the attitudes of both the general public and pharmacists towards the provision of drive-thru pharmacy services. Subsequently, the final chapter concludes the study by offering a detailed summary, as well as providing ideas and recommendations for future research endeavours.

# CHAPTER 2

# LITERATURE REVIEW

This chapter provides a comprehensive overview of the primary literature evaluation conducted for this research. It begins by discussing the supply of healthcare services in the pharmacy field, followed by an examination of the evolution of the pharmacy profession. Subsequently, the focus shifts to the practice of pharmaceutical treatment, and finally, an analysis of the Malaysian healthcare system is presented. Additionally, it offers an array of expanded pharmaceutical services, including a convenient drive-thru pharmacy service. Moreover, the literature review serves as a means to substantiate the rationale for doing the research.

## 2.1 Pharmacy healthcare services provision

### 2.1.1 Introduction

The ideal healthcare provision chain comprises physicians, pharmacists, nurses and paramedics, as stated by most healthcare providers (National Academies Press, 2005). According to (Institute of Medicine, 2009), pharmacy is regarded as the third biggest active healthcare provider in industrialised nations, highlighting its significant role and relevance in the healthcare sector. Meanwhile, based on (Goel et al., 1996), community pharmacists are seen as readily available healthcare practitioners who provide consultations and counselling services without requiring prior appointments. In the context of pharmaceutical care services, studies spotted light on newly added services and extended pharmacy services that achieved better

healthcare outcomes and optimised healthcare provider collaborations (Babar et al., 2018; Goode et al., 2019).

### 2.1.2 Pharmacy profession definition

The profession of pharmacy was officially established in 1959 by the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy, marking the first formal recognition of the field. The inclusion of a precise definition has contributed a significant level of clarity in differentiating the role of pharmacy in over-the-counter domains vs prescription-based contexts.

> *"Pharmacy is a profession that encompasses the art and science of preparing materials derived from both natural and synthetic sources, with the aim of providing acceptable and convenient substances for distribution and utilisation in the treatment and prevention of diseases. Pharmaceutical science encompasses the understanding and use of several aspects related to pharmaceuticals and treatments, including their identification, selection, pharmacological activity, prevention combination, analysis and standardisation. Additionally, it encompasses the appropriate and secure dissemination and use thereof."*(Ralph William. Clark, 1961)

### 2.1.3 Development of pharmacy profession

The pharmacy profession developed in old age through old men fighting to bring mandatory needs for their families. One of the most important needs was treating illness and injuries (Kremers et al., 1986).

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The real start of the pharmacy journey profession was with the role of the historical medical professional *Apothecary*, who formulated and dispensed medicines to patients and other healthcare providers, including surgeons and physicians. *Apothecary* offered medical advice in addition to the pharmacy responsibilities (Dictionary.com, 2012). Evolution continued to develop the role of the modern pharmacist. In the 1900s, in Britain, standards for pharmacists and pharmacies were regulated (Anderson, 2005). After that, the pharmaceutical industries started manufacturing medicinal products by the 1950s (Anderson, 2005). Then, the transition in the pharmacy profession to focus more on patients' outcomes started in the mid of 1960s by adding the clinical pharmacy concept, which promoted professional interactions with other healthcare professionals such as doctors and nurses, and expanded the roles of the pharmacy profession with newly added professional activities (Adamcik et al., 1986).

### 2.1.4 Development of pharmaceutical care practice

The inception of pharmaceutical care practice may be traced back to the elucidation of the pharmacy function by Helper and Strand in 1990. They defined it as "the conscientious provision of drug therapy with the aim of attaining specific outcomes that enhance the quality of life for patients" (Hepler & Strand, 1990). In 1997, Linda Strand provided a revised explanation of Helper and Strand's concept, stating that it involves the practitioner assuming responsibility for addressing the drug-related requirements of patients and being held liable for fulfilling this obligation (Strand, 1997). The concept mentioned in the literature has been widely recognised for its significant impact on shifting the practice of the pharmacy profession towards a greater emphasis on patient-centred care (Farris et al., 2005).

Several causes contributed to the shift of pharmaceutical care practice, as identified by the World Health Organization (WHO). These factors include the global rise in health needs, the proliferation of drugs and trade names, and the prevalent issue of poor adherence to prescription medications (World Health Organization, 2006). According to Rigby (2010), this transition facilitated enhanced collaboration between pharmacists and other healthcare professionals in order to improve the effectiveness of pharmaceutical administration. The use of pharmaceutical care practice is feasible across several settings, including community, hospital and clinic, among other contexts (Hepler & Strand, 1990). The community pharmacy is widely regarded as a highly suitable environment for delivering healthcare services to the general population, particularly when compared to other primary healthcare settings. This recognition is primarily owing to its accessibility, which extends to urban and rural areas, as well as its comparatively extended operating hours (Brown et al., 2014; Gilbert, 1997; Saramunee et al., 2015). The provision of pharmaceutical care in community pharmacy settings encompasses a diverse array of services, including both succinct and comprehensive counselling, as well as the introduction of additional services referred to as extended pharmacy services (Berbatis et al., 2010).

### 2.1.5   Extended pharmacy services

Pharmacy services that go beyond filling prescriptions and selling over-the-counter drugs are known as extended pharmacy services (EPS) and are given by pharmacies to customers (Moullin et al., 2013).

EPS are related to the services that are provided at pharmacies other than traditional services (ex. dispensing the prescribed or non-prescribed medications and giving counseling or instructions about dispensed medications). EPS include identifying

medication-related problems by doing comprehensive medication reviews, providing some monitoring for diseases such as measuring blood pressure reading or blood glucose level, and contacting the primary healthcare team (Berbatis et al., 2010; Moullin et al., 2013). Disease management, which includes a variety of services, such as comprehensive patient education on drugs or health-related conditions (Berbatis et al., 2010; Moullin et al., 2013), may also be used to detect medication-related issues. The newly added services targeted a special group of the population, including patients with comorbidities and those with low access to healthcare services (Desselle et al., 2019). It was also known as value-added services (VAS); these services promoted the medication dispensing process and decreased the workload on pharmacy staff (Abu Farha et al., 2017; Tan, 2016). VAS were introduced in Malaysian public health facilities to facilitate the process of medicine collection. Examples include Drive-through pharmacy or Drive-thru pharmacy, Medicine by Post, SMS Take&Go, Appointment Card and medicine locker, commonly referred to as Medibox (Mayers A, 2011; Yussof et al., 2022).

### 2.1.6   Social sphere of pharmacy

Health and illness are studied from a sociological perspective in the subject known as medical sociology (Cockerham & Ritchey, 1997). Medical sociologists examine not only the social contexts of health and illness but also the interplay between healthcare systems, the social roles of healthcare organisations and institutions, as well as the social practices of healthcare providers and (Cockerham & Ritchey, 1997). Behavioural sciences and health psychology are the main concepts in the social pharmacy aspect (Rickles et al., 2010). The social and behavioural aspects of pharmaceutical care convert theories and concepts to applied service provision

(Rickles et al., 2010). It is important to understand healthcare consumers' and providers' socio-behavioural aspects, such as attitudes, awareness and perceptions toward pharmaceutical care services (Harding & Taylor, 2002; Rickles et al., 2010). The collaboration between pharmacists with healthcare providers has been addressed among the social dimensions of the pharmacy profession (Harding & Taylor, 2002). A simple description of attitudes is a way of thinking or a propensity to behave towards something based on individual experiences (Jeffrey Pickens, 2005). However, the approach by which people organise and interpret their impressions towards any environmental information is the concept of perceptions (Jeffrey Pickens, 2005). Furthermore, being aware of something's existence is the definition of awareness (The Cambridge Dictionary, 2016).

### 2.1.7 Development of pharmacists' role in healthcare

Pharmacists are widely considered multidisciplinary and accessible healthcare providers for patients or customers (Farris et al., 2005; Goel et al., 1996). The recommended role of pharmacists assures mainly effective, good quality and safe medication administration (Dunlop & Shaw, 2002). Moreover, the cost, quality and results of pharmaceutical care services provided to the consumers are pharmacists' responsibility (Wiedenmayer, Karin, Summers, Rob S., Mackie, Clare A., Gous, Andries G. S., Everard, 2006). In many countries such as the UK, Spain, Canada and Australia, Minor Aliment Service (MAS) has been encouraged to be applied, which includes offering healthcare services by pharmacists in community pharmacies for minor health conditions without the physicians' referral (Porteous et al., 2016; Taylor & Joubert, 2016). Consequently, this has decreased the burden on healthcare centres and the cost borne by patients (Porteous et al., 2016). In Nigeria, the overall health coverage was suggested to be improved by involving community pharmacists in providing primary healthcare services, such as offering medicines for treating endemic diseases, disease prevention services and vaccine administration (Ihekoronye & Osemene, 2022).

Effective health services offered by community pharmacists relieved pressure on primary health facilities during epidemics like the 2009 H1N1 flu (Miller et al., 2012; Schwerzmann et al., 2017). In the US, more than 320,000 pharmacists were authorised to administer vaccinations in community pharmacies (American Pharmacists Association Foundation, 2020). The authorisation of pharmacists as vaccine administrators will aid in increasing the number of immunised people (Isenor et al., 2016). During disasters, pharmacists' roles are subdivided into four categories, namely prevention, preparedness, response and recovery (Watson et al., 2019).

Pharmacist as a profession includes those who remained functionally active even during quarantine (Bukhari et al., 2020; Dawoud, 2021). A guideline has been released by the International Pharmaceutical Federation (FIP) about the roles of community pharmacists during the COVID-19 pandemic; some of them include counselling, storing and supplying the needed pharmaceutical items like masks and hygiene products, educating the population and enhancing infection control (International Pharmaceutical Federation, 2022). In China, a study addressed that pharmacists in the community play a crucial role in health emergencies like the COVID-19 pandemic (Ung, 2020). Once emergencies occur, all healthcare providers are responsible for providing healthcare services (Cadogan & Hughes, 2021; Ung, 2020). Therefore, it is very important to recognise the role of pharmacists in the community in such situations, which could play a significant role in decreasing the burden on the public and general healthcare facilities (Cadogan & Hughes, 2021). In Malaysia, community pharmacists displayed their readiness and role as frontline healthcare providers during COVID-19 (Kua & Lee, 2021). Promoting the public health system and patients' healthcare outcomes was achieved by offering essential pharmaceutical care services with assuring safety standards, implementing teleconsultations and providing curb-side or drive-through delivery and pickup services (Kua & Lee, 2021).

## 2.2    Healthcare system in Malaysia

### 2.2.1   A brief overview about Malaysia

Located in Southeast Asia, the Federation of Malaysia consists of the Federal Territory of Labuan and the states of Sabah and Sarawak in East Malaysia (Figure 2.1). West Malaysia and the Malaysian Peninsula are separated from the rest of

Malaysia by the South China Sea. Thirteen states, plus the federal territories of Kuala Lumpur, Putrajaya, and Labuan, make up the Federation of Malaysia. These states are Perlis, Kedah, Pulau Pinang (Penang), Perak, Selangor, Negeri Sembilan, Pahang, Melaka, Johor, Kelantan, Terengganu, Sabah and Sarawak. With the exception of Melaka, Penang, Sabah and Sarawak, nine of the states are sultanates. East Malaysia is bordered by Kalimantan, Indonesia, and the Sultanate of Brunei, while West Malaysia is bordered by Thailand to the north and Singapore to the south. Its total land area is 330,524 square kilometres (Department of Staistics Malaysia, 2020; Jabatan Perangkaan Malaysia, 2019). The population of Malaysia reached 32.6 million (mn) by 2019, with an average annual population growth rate of 0.6%. In 2019, Malaysia's GDP was estimated at 371,024 RM million, and in the second quarter of 2015, its GDP grew by 4.9%, the fastest rate for the year (Jabatan Perangkaan Malaysia, 2019).
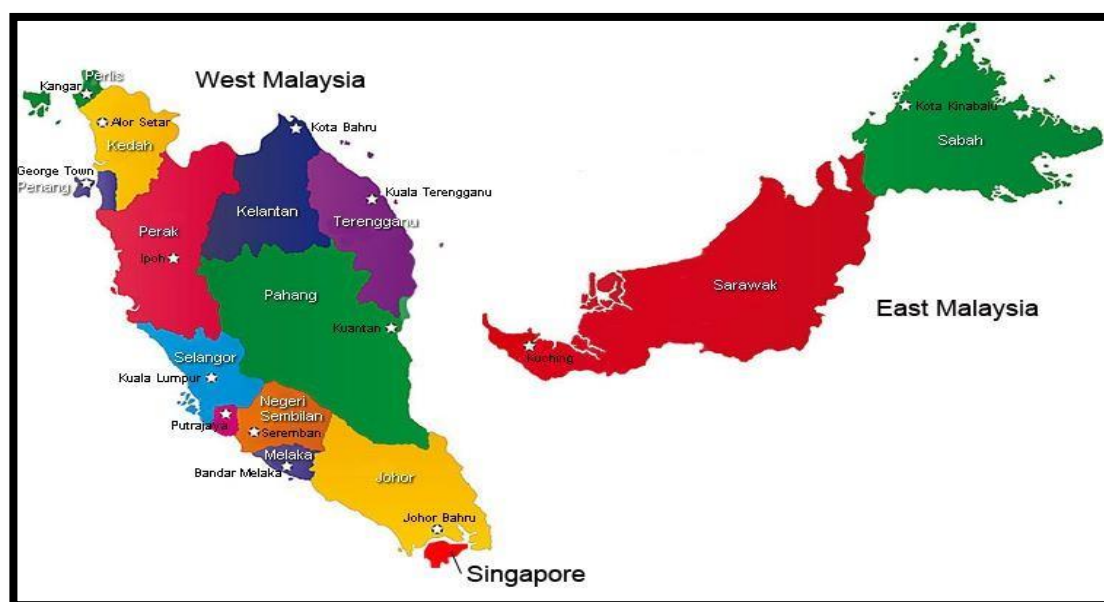


Figure 2.1      Geographical location of Malaysia

**Source:** Statistical Handbook, Malaysia 2019

The total employed population of Malaysia in 2019 second quarter was 15,078 mn when compared to 14,450 mn in 2017 (Jabatan Perangkaan Malaysia, 2019). In the second quarter of 2019, the reported unemployment rate was 3.3% (Jabatan Perangkaan Malaysia, 2019). Malaysia has made great gains in the life expectancy of its people: an increase between 1970 and 2019 for females from 65.6 to 77.3 years and for males from 61.6 to 72.2 years (Department of Staistics Malaysia, 2020; Jabatan Perangkaan Malaysia, 2019). In Malaysia, current life expectancy is above that of upper middle-income countries, but below high-income countries (83 years for females and 77 years for males) (WHO, Representative office for Malaysia, 2019).

Noncommunicable diseases (NCDs) like ischemic heart disease are the leading cause of death in Malaysia, accounting for 13.7% of all adult deaths in 2017 (WHO, Representative office for Malaysia, 2019), due to the country's epidemiological shift away from communicable diseases. Years of life lost owing to early death and years of healthy life lost due to disability are added together to create a metric called disability-adjusted life years (DALYs) to quantify the impact of illness. Of the total 6150.7 DALYs per 1000 population in 2014, 62% were due to premature mortality and 38% to non-fatal health outcomes. The disease burden was dominated by NCDs, accounting for 71% of the burden of disease, similar to other upper-middle-income countries (77%), yet about 20% higher than other South-East Asian countries (58%). Cardiovascular diseases (29%) and cancers (9%) were the most common NCDs (WHO, Representative office for Malaysia, 2019).

### 2.2.2 Malaysian healthcare system and provision of healthcare

The Ministry of Health (MOH) is directly responsible for the healthcare regulatory system in Malaysia (Pocock & Phua, 2011), with the support of other governmental organisations, including the Malaysian Medical Council, the Malaysian Medical Association, and the Association of Private Hospitals of Malaysia (APHM). Healthcare in Malaysia is divided between the publicly funded public sector and the privately operated private sector (Hassali MA et al., 2009). The government heavily subsidises the public sector, which provides 70% of healthcare services. The MOH is the primary government agency responsible for delivering healthcare services in the nation in the public sector. Both corrective and rehabilitative services are provided by the commercial sector, which is solely funded on a fee-for-service basis. Patients, their employers, and/or their insurance providers for-profit hospitals are expanding quickly in most developing nations, including Malaysia. Currently, private healthcare providers rule the market, whereas 62% of hospitals are wholly controlled by private companies (Ministry of Health Malaysia, 2019).

Public hospitals supported by the government and non-profit private hospitals managed by civil society organisations from varied backgrounds have both existed for a long time (Ministry of Health Malaysia, 2019). High-quality healthcare services are primarily provided through the private healthcare sector. The sector's innovation is mostly focused on increasing the services' physical, human capital and network capacities while also raising their overall capacity and quality.

These providers' strategies include constant development and expansion in a variety of healthcare facilities in an effort to meet the rising demand for improved

healthcare services and draw in more health-conscious travellers. This effort includes creating hospitals that adhere to international standards, delivering cutting-edge technologies, managing them under the supervision of highly qualified consultants and employees, as well as offering first-rate hotel facilities (Ministry of Health Malaysia, 2019). Furthermore, the private sector in Malaysia which includes community pharmacies has grown to be a dominant force by following actions: a. the investments in cutting-edge medical technologies have increased their productivity, b. utilising the most recent electronic medium, medical records are now easier to obtain and are recorded with greater speed and accuracy, c. the improvement of healthcare services has increased as a result of partnerships with research and development (R&D) facilities. The healthcare information system, medical devices, as well as medical procedures have all undergone constant improvement as a result of partnerships with R&D departments and regional institutions, d. the best talent has been attracted to and produced by this industry. By bringing on medical experts from a range of specialities, these institutions are dedicated to enhancing the quality of the healthcare services they provide to their customers, e.    ongoing training and development programs are also offered to strengthen the abilities of the current workforce, f. the Malaysian government promotes medical tourism, and international patients choose to receive treatment at private hospitals for a variety of reasons. The Malaysian Healthcare Travel Council was established by the government in 2009, comprising individuals from the public and commercial sectors. To provide better health tourism packages, some of these hospitals have relationships with well-known airlines and travel companies. Additionally, several of these medical facilities have their international patient centres remodelled to accommodate their foreign patients' needs, g. English-speaking employees have broken the language barrier for health