รายงานผลการสำเร็จการศึกษา
หลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชาเภสัชศาสตร์สังคมและบริหาร
คณะเภสัชศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

ภายใต้การรับทุนสนับสนุนจากมูลนิธิอาจารย์ เกษม ปังศรีวงศ์
ในโครงการ “ความต้องการข้าราชการตำรวจผู้มีคุณวุฒิวิทยาศาสตรมหาบัณฑิต
สาขาเภสัชศาสตร์สังคมและบริหาร”

ผู้รับทุน
ว่าที่ พ.ต.ท. ตรีศักดิ์ เจตสุรกานต์
เภสัชกร(สบ ๒) กลุ่มงานเภสัชกรรม โรงพยาบาลตำรวจ

๑๘ กุมภาพันธ์ ๒๕๖๘

เรียน ท่านประธานมูลนิธิ อาจารย์เกษม ปังศรีวงศ์

เรื่อง ขอรายงานผลงานการศึกษาต่อ ระดับปริญญาโท ของผู้รับทุน ฯ ว่าที่ พ.ต.ท. ตรีศักดิ์ เจตสุรกานต์

สิ่งที่ส่งมาด้วย ๑. ผลการศึกษา ภาคการศึกษาต้น ปีการศึกษา ๒๕๖๓ - ภาคการศึกษาต้น ปีการศึกษา ๒๕๖๗

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๓. ผลการตอบรับการตีพิมพ์ผลงานวิจัยจากวารสาร

๔. ผลงานวิจัยที่ได้รับการตีพิมพ์

๕. บันทึกขอสำเร็จการศึกษา

๖. ภาพประกอบคุณภาพวารสาร

๗. ภาพประกอบการประชาสัมพันธ์ผ่านช่องทางสื่อสังคม

ตามที่ ข้าพเจ้า ว่าที่ พ.ต.ท. ตรีศักดิ์ เจตสุรกานต์ เภสัชกร(สบ ๒) กลุ่มงานเภสัชกรรม โรงพยาบาลตำรวจ ผู้ซึ่งได้รับทุนการศึกษาต่อ ระดับปริญญาโท เป็นจำนวนเงิน ๖๐,๐๐๐ บาท (หกหมื่นบาท) ต่อปีการศึกษา จำนวน ๒ ปีการศึกษา (๒๕๖๓ - ๒๕๖๔) จากมูลนิธิ อาจารย์เกษม ปังศรีวงศ์ นั้น

ขณะนี้ข้าพเจ้าได้สำเร็จการศึกษาเป็นที่เรียบร้อยแล้ว จึงขอจัดส่งผลการศึกษา ผลการส่งวิทยานิพนธ์ฉบับสมบูรณ์ ผลการตอบรับการตีพิมพ์ผลงานวิจัยจากวารสาร ผลงานวิจัยที่ได้รับการตีพิมพ์ บันทึกขอสำเร็จการศึกษา และภาพประกอบตามรายละเอียดที่ส่งมาด้วย

จึงเรียนมาเพื่อโปรดพิจารณา

ว่าที่ พ.ต.ท.

(ตรีศักดิ์ เจตสุรกานต์)

เภสัชกร(สบ ๒) กลุ่มงานเภสัชกรรม รพ.ตร.

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faculty of Pharmaceutical Sciences

Department of Social and Administrative Pharmacy

Field of Study Social and Administrative Pharmacy

COURSE NO	ABBREVIATED NAME	CREDIT	GRADE
	1ST SEMESTER 2020		
3313703	RES METHOD SAP	3.0	V
3313704	APPL STAT SAP I	3.0	V
3313720	PHARMACOECONOMICS	3.0	V
3313731	SEM SAP I	1.0	S
3313816	THESIS	5.0	S

CA	CG	GPA	CAX	CGX	GPAX	GPX
0.00	1.00	0.00	0.00	1.00	0.00	0.00

	2ND SEMESTER 2020	
3313718	INDIV STUD II	2.0 V
3313732	SEM SAP II	1.0 S
3313816	THESIS	11.0 S

CA	CG	GPA	CAX	CGX	GPAX	GPX
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	1ST SEMESTER 2021	
3313816	THESIS	10.0 S

CA	CG	GPA	CAX	CGX	GPAX	GPX
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	2ND SEMESTER 2021	
3313816	THESIS	10.0 S

CA	CG	GPA	CAX	CGX	GPAX	GPX
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	1ST SEMESTER 2022	
3313816	THESIS	0.0 S

CA	CG	GPA	CAX	CGX	GPAX	GPX
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	2ND SEMESTER 2022	
3313816	THESIS	0.0 S

CA	CG	GPA	CAX	CGX	GPAX	GPX
0.00	0.00	0.00	0.00	2.00	0.00	0.00

CA = CREDIT ATTEMPTED
CG = CREDIT GRANTED
GPA = GRADE POINT AVERAGE
CAX = CUMULATIVE CA
CGX = CUMULATIVE CG
GPAX = CUMULATIVE GPA
GPX = CUMULATIVE GP

Student Grade Report

As of 13 February 2025

CHULALONGKORN
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Name Acting Pol.Lt.Col. Trisak Chetsurakarn Student ID. Gender Male

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COURSE NO	ABBREVIATED NAME	CREDIT	GRADE

1ST SEMESTER 2023

STATUS MAINTAINING

CA	CG	GPA	CAX	CGX	GPAX	GPX
0.00	0.00	0.00	0.00	2.00	0.00	0.00

2ND SEMESTER 2023

STATUS MAINTAINING

CA	CG	GPA	CAX	CGX	GPAX	GPX
0.00	0.00	0.00	0.00	2.00	0.00	0.00

1ST SEMESTER 2024

STATUS MAINTAINING

CA	CG	GPA	CAX	CGX	GPAX	GPX
0.00	0.00	0.00	0.00	2.00	0.00	0.00

CA = CREDIT ATTEMPTED
CG = CREDIT GRANTED
GPA = GRADE POINT AVERAGE
CAX = CUMULATIVE CA
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GPAX = CUMULATIVE GPA
GPX = CUMULATIVE GP

ภาพประกอบผลการส่งวิทยานิพนธ์ฉบับสมบูรณ์

บัณฑิตวิทยาลัย
GRADUATE SCHOOL
Chulalongkorn University

รายชื่อนิสิตที่ส่งวิทยานิพนธ์ฉบับสมบูรณ์ ภาคการศึกษาปลาย ปีการศึกษา 2565

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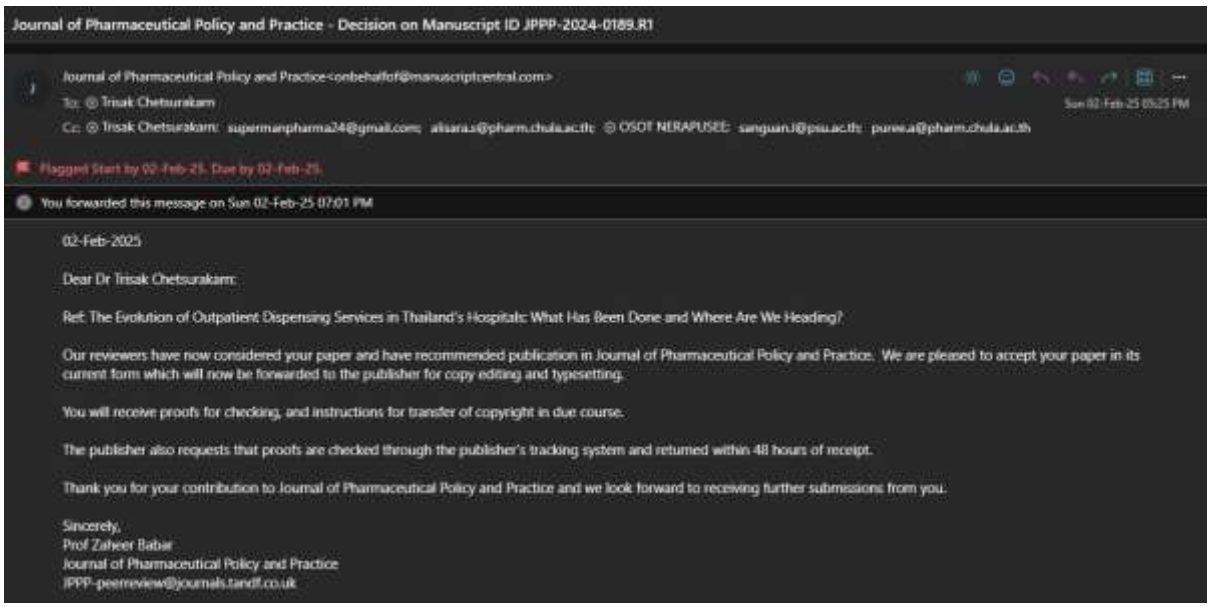

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The evolution of outpatient dispensing services in Thailand's hospitals: what has been done and where are we heading?

Trisak Chetsurakarn, Nattapong Khansai, Alisara Sangviroon Sujarit, Osot Nerapusee, Sanguan Lerkiatbundit & Puree Anantachoti

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RESEARCH ARTICLE

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The evolution of outpatient dispensing services in Thailand's hospitals: what has been done and where are we heading?

Trisak Chetsurakarn [a,b], Nattapong Khansai[b], Alisara Sangviroon Sujarit[c], Osot Nerapusee [a,d], Sanguan Lerkiatbundit[e] and Puree Anantachoti [a]

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ABSTRACT

Background: Outpatient pharmacy dispensing services in Thailand require patients to fill prescriptions at hospital pharmacies for reimbursement.

Objective: This study explored hospital outpatient dispensing services in Thailand before, during, and after the COVID-19 pandemic. Characteristics of most frequently used alternative services were described. The study further explored the challenges and enablers associated with continuation of alternative hospital outpatient dispensing services.

Methods: This study utilised a telephone survey targeting management-level hospital pharmacists from various hospital types and sizes. A stratified random sample of 305 hospitals was drawn from 1,471 hospitals. Data was collected using a validated semi-structured interview questionnaire between June-October 2022. Descriptive statistics and content analysis were used for data analysis.

Results: Data from 189 public hospitals were analysed. Before COVID-19, 38.6% of hospitals implemented at least one type of alternative outpatient dispensing service to reduce overcrowding and waiting times. During the pandemic, 97.4% of hospitals implemented alternative services with drug delivery service being most popular among large hospitals. Primary hospitals utilised other services such as subdistrict hospital network which better suited their contexts. Post-pandemic, many large-sized hospitals planned to continue drug delivery service. Enabling factors included reducing overcrowding and supporting patients, while challenges were workload and patient willingness to pay.

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Conclusion: The COVID-19 pandemic has redefined outpatient dispensing services in Thailand, making drug delivery a new norm. Hospitals should evaluate current situations and adjust criteria and workflows to sustain these services.

ARTICLE HISTORY Received 17 July 2024; Accepted 2 February 2025

KEYWORDS Dispensing service; alternative service; drug delivery; prescription refill; hospital-community pharmacy network

Background

Hospital overcrowding is a significant challenge in Thailand, contributing to prolonged patient waiting times. A study at a tertiary hospital's General Practice Clinic reported an average waiting time of approximately 175.87 min (nearly 3 h), with a standard deviation of 68.66 min. This includes time spent on medical consultations, medication dispensing, and diagnostic procedures like blood tests and X-rays but excludes round-trip transportation time, which can take up to four hours (Boonma et al., 2018). Overcrowding adversely affects patients and healthcare providers, causing frustration, reduced satisfaction, delays in medical attention, and potential health deterioration for patients. Healthcare professionals face increased workloads and stress, leading to burnout and compromised care quality. Overcrowding also heightens infection risks and strains hospital resources, jeopardising patient safety and staff well-being (Kongcheep et al., 2022).

The issue of hospital overcrowding in Thailand arises from multiple factors, particularly the aging population and the country's universal healthcare system. Thailand has been an aging society since 2005 and is projected to become a hyper-aging society by 2040, increasing demand for healthcare services (World Health Organization, 2023). Moreover, public health insurance schemes – Universal Coverage Scheme (UCS), Social Security Scheme (SSS), and Civil Servant Medical Benefit Scheme (CSMBS) – require beneficiaries to fill prescriptions exclusively at hospital pharmacies, further contributing to high patient volumes.

Hospitals have implemented various measures to address overcrowding, particularly in pharmacy departments. Alternative outpatient dispensing services such as hospital-community pharmacy networks, drug delivery, prescription refill, and drive-through services were introduced over the past decade. However, the conventional model of dispensing medications at hospital pharmacies remains predominant. The hospital-community pharmacy coordination model, initiated in 2005 by the Pharmacy Council and the National Health Security Office (NHSO), enabled patients to fill prescriptions at nearby pharmacies, reducing hospital visits and waiting times (Hfocus

team, 2019, 2020b; Lochid-amnuay et al., 2010, 2011). Challenges include higher drug costs for community pharmacies and inadequate IT infrastructure for seamless patient data exchange. Despite these issues, the model regained relevance during the COVID-19 pandemic when minimising hospital visits became imperative.

Drug delivery services were first implemented in 2014 by Siriraj Hospital, followed by Pranangklao Hospital in 2015 (Pranangklao Hospital, 2015; Tungjittiporn & Thantai, 2015). These services freed patients from hospital visits but raised concerns about timely delivery, medication integrity, and increased administrative costs. Additionally, regulations requiring face-to-face dispensing in licensed settings posed compliance challenges (Pranangklao Hospital, 2015; Tungjittiporn & Thantai, 2015).

Prescription refill at the hospital was uncommonly practiced in the past due to reimbursement policies that required patients to receive a diagnosis on the same day they acquired their medication. Typically, patients received a 2–6-month supply of drugs without a refill prescription. Prescription refill clinics initially established in 1998 for stable diabetes patients, have since expanded to other noncommunicable diseases (NCDs), particularly in hospitals facing physician shortages (Sinchai, 2004).

Meanwhile, drive-through dispensing, introduced by Vachira Phuket Hospital in 2021, allowed patients to obtain medications following diagnosis, either in person or via telemedicine (Vachira Phuket Hospital, 2021).

The COVID-19 pandemic further disrupted conventional outpatient dispensing services. Stringent distancing measures accelerated the adoption of alternative models, highlighting systemic challenges like resource limitations and regulatory compliance. However, there is limited information on outpatient dispensing service patterns in Thailand. Understanding these trends, along with their challenges and enablers, is critical for maintaining efficient healthcare delivery. This study aimed to explore the evolution of hospital outpatient dispensing services in Thailand before, during, and after the COVID-19 pandemic. Characteristics of most frequently used alternative services were described. Additionally, it further explored the challenges and enablers associated with continuation of alternative hospital outpatient dispensing services, offering insights applicable to Thailand and other low- and middle-income countries (LMICs).

Methods

This study employed a cross-sectional telephone survey. This study aimed to interview management-level hospital pharmacists from both government and private hospitals who had at least five years of experience in outpatient dispensing services. Stratified simple random sampling was conducted. The list of hospitals ($N = 1{,}471$) was retrieved from the Ministry of Public Health's hospital database (Health Data Center of Ministry of Public Health,

n.d.) and served as the sampling frame. Hospitals were stratified by type (public vs. private) and size (large, medium, or small). The study required a minimum of 305 hospitals. The sample size was justified using the formular for proportion estimates for finite populations, assuming a 0.5 probability of conducting alternative outpatient dispensing service, a 5% margin of error, and a 95% confidence interval (Daniel, 1995).

Given the limited number of large hospitals, the study intentionally included all university hospitals, tertiary hospitals, secondary hospitals, and large private hospitals. The selection of other hospitals was randomised, employing a probability proportional to size.

A semi-structured interview questionnaire was developed to investigate outpatient dispensing service patterns in Thailand before (up to December 2019), during (between January 2020 and September 2022), and after the COVID-19 pandemic (since October 2022), including an assessment of facilitating factors and barriers. The questionnaire consisted of 3 parts (see detailed in Appendix 1):

Part I: Hospital outpatient dispensing service implemented before, during and after COVID-19 pandemic

Part II: Opinions on the alternative hospital outpatient dispensing services, and

Part III: General information of the hospitals and participated pharmacists.

The content validity of the questionnaire was confirmed by five experts. The Index of Item-Objective Congruence (IOC) achieved 0.98 confirmed that the semi-structure interview questionnaire was valid. The telephone survey, conducted between June and October 2022, involved two interviewers (TC and NK) with backgrounds in hospital pharmacies. These interviewers underwent thorough training and rehearsal and then conducted the interviews rigorously according to predetermined questions with audio files for paraphrasing.

To approach pharmacists in the hospitals, an introductory letter, along with a survey questionnaire, was sent to seek permission from hospital administrators. Telephone interviews were scheduled based on the availability of management-level pharmacists and were typically conducted between 2–4 pm. Each interview took approximately 20 min to complete. Descriptive statistics, including counts, percentages, central tendency (mean) and dispersion (standard deviation), were performed to describe what kinds of pharmacy dispensing services were used before, during and after the COVID-19 pandemic. Opinions regarding the provision of alternative pharmacy dispensing services were analysed using qualitative content analysis (QCA).

The study received approval from the Research Ethics Review Committee for Research Involving Human Research Participants, Group 1, Chulalongkorn University, Thailand (Ethics ref: COA No. 104/65) on 18 May 2022.

Results

Between June and October 2022, 305 selected hospitals were approached. Among these, 223 institutions were successfully reached, 197 of which agreed to participate in telephone interviews, yielding a response rate of 64.59%. Nonparticipation reasons included inability to contact the participants ($n = 13$), unwillingness to respond ($n = 8$), and further requiring institutional review board approval ($n = 5$).

The majority of participating hospitals were public (96.94%), with 37.59% and 32.33% identified as secondary and primary hospitals, respectively. Geographically, a substantial proportion of hospitals were located in the northeastern region (41.54%), followed by Bangkok and nearby regions (15.74%), the northern region (15.23%), southern region (12.69%), central region (5.08%), and western region (3.55%). The study did not include six private hospitals (two large- and four medium-sized) in the analysis due to the limited sample size. Data from two new university hospitals were not included because the hospitals were not fully operated. Consequently, 189 public hospitals were included in the analysis. The detailed characteristics of the participating hospitals and pharmacists are provided in Table 1.

Table 1. Characteristics of participating hospitals and respondents.

	Hospital types			
Characteristics	University ($n = 16$)	Tertiary ($n = 34$)	Secondary ($n = 74$)	Primary ($n = 65$)
Hospitals' characteristics				
Number of outpatient pharmacists Mean ± SD (Min, Max)	25.50 ± 26.29 (6, 108)	15.82 ± 6.60 (3, 34)	6.89 ± 3.01 (1, 18)	3.72 ± 1.65 (1, 9)
Patients to Pharmacist ratio Mean ± SD (Min, Max)	77.48 ± 38.60 (33, 174)	89.38 ± 41.84 (28, 200)	98.04 ± 85.52 (6, 543)	74.55 ± 40.01 (20, 200)
Number of outpatient pharmacist assistants Mean ± SD (Min, Max)	32.13 ± 36.77 (1, 150)	22.76 ± 12.68 (7, 52)	8.70 ± 5.22 (1, 30)	4.46 ± 2.08 (1, 10)
Patients to Pharmacist assistant ratio Mean ± SD (Min, Max)	90.51 ± 90.23 (32, 383)	68.65 ± 42.75 (25, 200)	94.24 ± 105.60 (7, 543)	66.05 ± 47.20 (17, 300)
Number of patients Mean ± SD (Min, Max)	1,828.13 ± 1,424.78 (200, 4,800)	1,329.50 ± 642.70 (250, 3,000)	635.27 ± 560.68 (30, 3,800)	261.41 ± 149.21 (30, 700)
Pharmacists' characteristics				
Gender %M: %F: %LGBTQ+	25.00: 75.00: 0.00	14.71: 85.29: 0.00	20.27: 78.38: 1.35	23.08: 75.38: 1.54
Age Mean ± SD (Min, Max)	42.63 ± 7.82 (31, 54)	47.26 ± 7.95 (27, 58)	40.3 ± 6.68 (28, 53)	39.51 ± 7.80 (27,55)
Experience in outpatient pharmacy service Mean ± SD (Min, Max)	14.38 ± 7.90 (5, 30)	17.79 ± 8.37 (5, 32)	13.77 ± 6.81 (5, 28)	14.03 ± 7.95 (5, 35)

Hospital outpatient dispensing service patterns before, during and after the COVID-19 pandemic.

The telephone interviews were conducted from June to October 2022. The predominant outpatient dispensing service in the **pre-COVID-19 era** was the drug dispensing service at hospital pharmacy departments. However, the study revealed that 38.6% of the participating hospitals reported implementing at least one type of alternative outpatient dispensing services, with a range of 27.0% in secondary hospitals to 76.5% in tertiary hospitals. The detailed patterns of alternative outpatient dispensing services across different hospital types are provided in Figure 1.

The preference for alternative outpatient dispensing services varied by hospital size. University hospitals preferred 'prescription refill at hospital' (37.5%), while tertiary hospitals preferred 'hospital-community pharmacy network' (52.9%), secondary hospitals equally preferred 'sub-district hospital network' (10.8%), 'prescription refill at the hospital' (10.8%) and 'hospital-community pharmacy network' (9.5%), and primary hospitals preferred 'sub-district hospital network' (26.2%).

Hospitals explained that alternative outpatient dispensing services were implemented in the pre-COVID-19 pandemic outbreak mainly because they wanted to reduce overcrowding within hospitals and to decrease patient waiting times. Other reasons included 'improve patient convenience and satisfaction' (through drug delivery, hospital-community pharmacy networks, and drive-through services), 'improve patients' compliance' (through sub-district hospital network), 'supporting insurer's policy' (through hospital-community pharmacy network) and 'minimise drug inventory and associated costs' (through prescription refill at the hospital).

During the COVID-19 pandemic, most hospitals (97.4%) implemented at least one alternative outpatient dispensing service, with five hospitals reporting not providing any alternative services. The five hospitals explained that due to the small size of hospitals with limited pharmacists and pharmacist assistants, the workload was manageable, and the hospitals were not considered crowded; thus, there was no need to implement any alternative dispensing services.

'Drug delivery service' was the most popular method among university hospitals (93.8%), tertiary hospitals (100%) and secondary hospitals (70.3%). On the other hand, primary hospitals utilised 'sub-district hospital network' (63.08%), followed by 'village health volunteers' (61.5%). 'Prescription refill at the hospital' was increasingly utilised in tertiary hospitals (from 26.5% to 52.9%), secondary hospitals (from 10.8% to 43.2%) and primary hospitals (from 4.6% to 36.9%). The adoption of alternative outpatient dispensing during the COVID-19 pandemic was a government policy that urged people to stay home and practice social distance to reduce the spread of COVID-19.

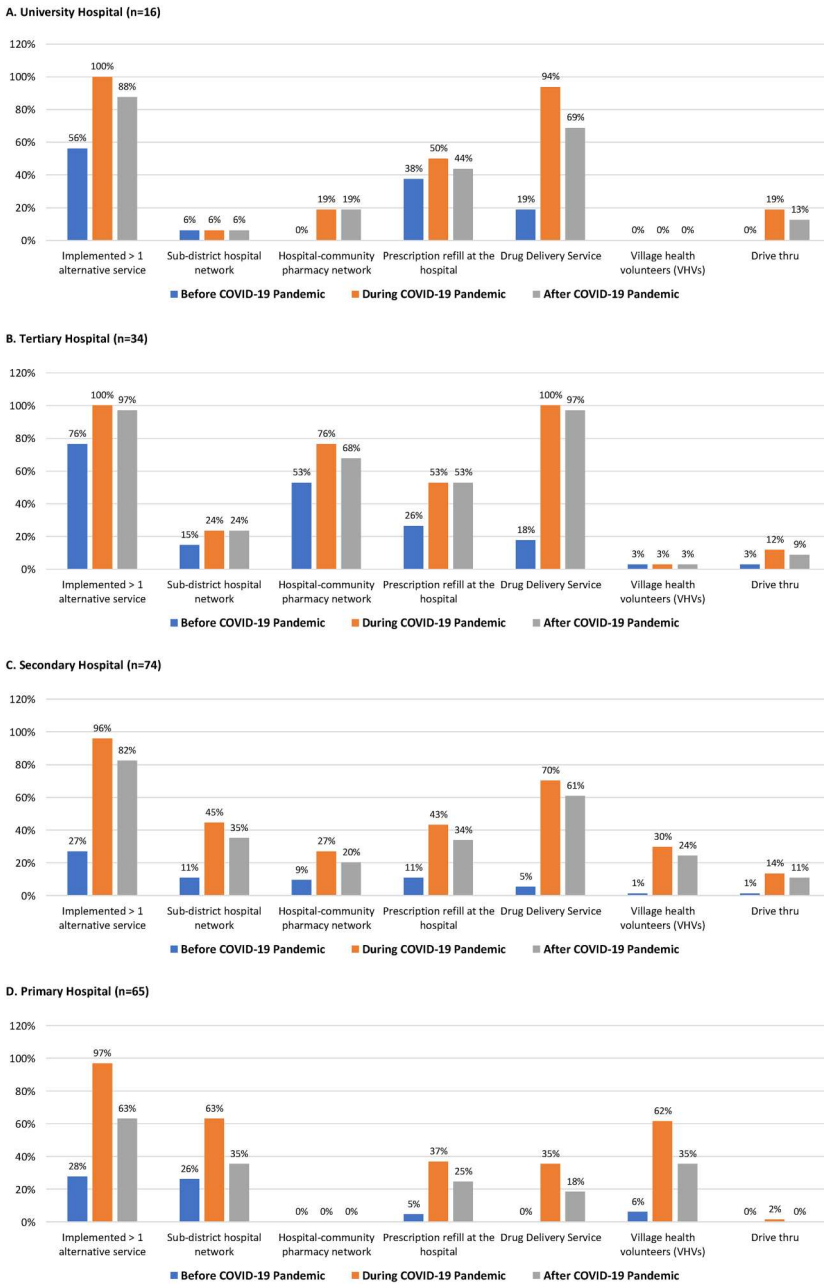

Figure 1. Patterns of alternative outpatient dispensing service across different hospital types: A: University hospital ($n = 16$), B: Tertiary hospital ($n = 34$), C: Secondary hospital ($n = 74$), D: Primary hospital ($n = 65$).

Note: Each hospital could implement more than one outpatient dispensing service.

The COVID-19 pandemic was declared to be over by the Ministry of Public Health on 1 October 2022. The telephone survey inquired during that period asking whether hospitals would continue providing alternative outpatient dispensing services in the **post-COVID-19 era**. Nineteen percent of the hospitals said that they would no longer provide alternative outpatient dispensing services. Among different hospital sizes, more than 80% of university, tertiary and secondary hospitals expressed that they would continue the services. The 'drug delivery services' was highly reported to be continued by tertiary hospitals (97.1%), followed by university hospitals (68.8%) and secondary hospitals (60.8%). 'Prescription refill at the hospital' was also reported as the second most popular service to be continued after the end of COVID-19 pandemic, especially among tertiary and university hospitals, because it will help improve medication management, resulting in a reduction in excess unused medications in patients' homes. Primary hospitals tended to discontinue alternative dispensing services compared to other hospital types. They expressed that alternative outpatient dispensing services needed more staff and time, but primary hospitals had very few pharmacists and pharmacist assistants. Moreover, patients in the provinces not only perceived that they received tangible care from doctors and other health professionals but also that hospitals were places where they can socialise with other patients and caretakers who they know quite well in the area. Thus, alternative outpatient dispensing services might not fit in normal situations for small primary hospitals.

Characteristics of the selected alternative outpatient dispensing services

Three alternative outpatient dispensing services, namely, drug delivery, prescription refill at the hospital and the hospital-community pharmacy network, were selected for detailed explanation because they were popular and likely to be continued.

Drug delivery service

Although drug delivery services were not popular before the COVID-19 pandemic, they became increasingly utilised during the pandemic and were likely to be continued afterwards by all hospital types. In general, drug delivery services are highly well known in Thailand, especially for consumer goods and food, but are not widely used for medicines due to restrictions imposed by the Drug Act AC 1967. According to the Drug Act, drugs must be dispensed within authorised settings, and proper advice for drug administration and adequate information regarding possible adverse drug reactions must be provided.

To implement drug delivery services, hospitals usually set criteria related to patient conditions, drug characteristics and related communication

processes with related healthcare professionals. According to the interviews, a common set of criteria composed of

- Patients with stable NCDs, e.g. patients with stable hyperlipidaemia, hypertension, diabetes, and psychiatric disease.
- Patients had prior experience in using the prescribed drugs.
- Drug products should be in solid dosage form and not fragile.
- Drug products should not be temperature sensitive.
- Narcotic or psychotic substances are prohibited. However, later, the regulator allowed a one-month supply of drugs in these classes during the COVID-19 pandemic.

All drug items must meet every preset requirement; otherwise, the patients must fill their prescription from the hospital pharmacy department. The interviews revealed that in practice, many questions arise after drug delivery implementation, such as the following:

- whether the scope of diseases other than 'NCD' can be expanded to conditions other than those previously specified, for example, eye conditions (e.g. dry eye) and pain (e.g. muscle pain, osteoarthritis).
- whether additional drug items for acute conditions, e.g. cough and cold, or allergies can be dispensed via vendors.
- concerns regarding high-risk drugs, e.g. warfarin and methotrexate, which some hospitals did not allow for direct delivery to patients.
- The total weight of the drug parcel was a concern for some hospitals.

Most drug delivery services utilise postage vendors such as Thailand Post, Grab, and Kerry. However, other types of vendors, such as Siam Cement Group (SCG) and 7-Eleven, also participate in this service. SCG, the largest conglomerate in Thailand, focuses on cement-building materials, chemicals, and packaging. 7-Eleven is a well-known global chain of convenience stores with more than 14,000 branches in Thailand. Both SCG and 7-Eleven have their own supply chain operations and provide additional services, delivering drugs from hospitals to patients along with their own products.

Most of the mentioned vendors promised to send drug parcels directly to patients' residences, except for 7-Eleven. 7-Eleven arranged to have the drugs sent from the hospital to a designated 7-Eleven store selected by the patients. Once the drug parcels arrived, the store managers called the patients to pick up their medicines at the store.

Although all stable NCD patients could opt for drug delivery service, the interviewees stated that approximately 40-80% of the patients did so. Those who utilised the drug delivery service had to pay a 100–120 Baht delivery fee per package. A flat rate delivery fee was applied across the country.

During the pandemic, the NHSO provided a subsidy of 50 Baht per package eligible under this scheme.

Village health volunteers (VHVs) can be considered a part of a drug delivery service that utilises volunteers instead of vendors. They are representatives who take care of health prevention and promotion activities in their villages including inquiries for referrals of the people in their care to primary care doctors. During the COVID-19 pandemic, VHVs delivered medicines from hospitals to their neighbors in the responsible area. VHVs are prevalent among small hospitals, especially those located in provincial areas.

Prescription refill at the hospital

Although prescription refill at the hospital was not a frequently utilised alternative before COVID-19, this service was implemented across all hospital types. During the pandemic, the utilisation of prescription refill service increased 1.3–9 times compared to pre-COVID-19 period. Hospitals of all sizes planned to continue offering this service even after the pandemic.

Prescription refill is a concept that has been implemented worldwide, but it has been limitedly implemented in Thailand due to reimbursement policies that require patients to receive a diagnosis on the same day they acquire their medication. The participants stated that the main purposes of prescription refill at the hospital were to solve the drug inventory problem, decrease the amount of drug dispensing (usually dispensed for 3–6 months) and minimise drug overstock events.

Criteria for prescription refill at the hospital can be borrowed from the drug delivery service, both for patient conditions and drug product characteristics. From the patients' perspective, this allowed them to spend much less time at hospitals because they could skip doctor visits. From a healthcare professional perspective, doctors usually delegate to pharmacists to split prescriptions, e.g. if the doctors prescribe 4-month supply medicines, pharmacists split the prescription and dispense a two-month supply for two refills. Upon refilling the prescription, pharmacists must ensure that patients are in stable condition and meet the refill requirement before handling the medicines. Most pharmacists stated that they do not want to bear responsibility for splitting the prescription.

Hospital–community pharmacy network

The findings revealed that the hospital-community pharmacy network was quite popular among tertiary hospitals, with half of them implementing this service before the COVID-19 pandemic. During the pandemic, this alternative service expanded in both tertiary and secondary hospitals. Instead of going to hospitals, patients could pick up their medicines from nearby community pharmacies. It should be noted, however, that this strategy was unique to the NHSO, which covered 71% of the Thai population.

Since the establishment of the hospital-community pharmacy network in 2005, the NHSO has gradually created three working models. The objective of the NHSO in encouraging the hospital-community pharmacy network was to solve the overcrowding problem. In return, two key incentives for community pharmacies were addressed: (1) broadening the visibility of community pharmacists and (2) increasing the traffic of patients/customers in contracted community pharmacies. Upon participating in the hospital-community pharmacy network, community pharmacies receive an administrative fee of 80 Baht per patient (approximately 2.3 USD). However, a foreseeable problem was detected, especially the higher cost of drugs acquired by community pharmacies compared to hospitals. The three working models implemented chronologically to solve the cost problem are described below:

- Model 1: Hospitals prepared medicines for each patient who agreed to pick up their prescription at community pharmacies. Medicines were delivered to specified community pharmacies based on the delivery schedule. Community pharmacies would call the patients to inform them that their medications were ready for pickup. This model solved the cost problem and ensured that patients received the exact branded medicines but created an unnecessary workload for hospital pharmacists.
- Model 2: Hospital arranged a certain stock of related NCD medicines for community pharmacies. Community pharmacies received prescriptions from hospitals and dispensed the medicines provided by hospitals to the patients. This model still solved the drug cost problem, reduced hospital pharmacists' workload, and ensured that patients received the exact branded medicines. However, the special NHSO-NCD drug stock created an additional workload for community pharmacies.
- Model 3: Community pharmacies receive patients' prescriptions and dispensed medicines from their own stock to patients while bearing the cost, which might be higher than the listed cost. This model was not financially practical for most independent community pharmacies, but it worked well for large chain or franchise community pharmacies with high bargaining power.

According to the interviews, Model 1 was frequently mentioned, with only one hospital mentioning Model 2 and none mentioning Model 3. In general, hospital-community pharmacy networking seemed to be helpful in reducing the crowded hospital problem. However, several issues arose:

(1) Patient information sharing between hospitals and community pharmacies was limited. Currently, no digital platform exists. Community pharmacists cannot access patients' basic information and cannot provide

additional input to hospitals. Communication between the two parties mainly utilised telephone and LINE platforms.

(2) Under Model 1, it might take 2–5 days for patients to be able to pick up their medicines. This delay was due to the drug preparation and delivery process.

(3) According to Model 3, patients may receive drugs of different brands from community pharmacies. This created concern regarding patient compliance and deviation of the clinical outcomes.

(4) Community pharmacists complained about the tedious process of filling out applications to reimburse 80 Baht of administrative fees. Additionally, reimbursement from the NHSO took several months.

Challenges and enablers associated with continuation of alternative outpatient dispensing services

Inquiring management-level pharmacists regarding hospitals' decisions whether to continue providing alternative outpatient dispensing services, 63.1-97.1% of the participating hospitals agreed so. Large hospitals (e.g. secondary, tertiary and university hospitals) seemed to continue providing alternative services, while primary hospitals tended to discontinue such services. The key reasons for discontinuing alternative services among primary hospitals included (1) limited human resources, (2) a low patient-to-pharmacist ratio, (3) a unique preexisting networking model, e.g. sub-district hospital networks as well as VHVs, which fit well with their settings, and (4) the embedded culture of the local people who wanted to meet their doctors/nurses in person and to socialise with other patients and caretakers during hospital visits.

The below section provides the reasons why large hospitals continue to provide three alternative outpatient dispensing services.

Drug delivery service was the most popular method reported after the COVID-19 pandemic by tertiary hospitals (97.1%), followed by university hospitals (68.8%) and secondary hospitals (60.8%). The reasons why these hospitals would like to continue drug delivery services included the following: (1) they were aligned with hospitals' commitments to reduce overcrowding problems, (2) they reduced patients' waiting times at hospitals, (3) they were the patients' preferred service as the parcels were delivered to designated addresses, and (4) they particularly benefited patients with special needs, e.g. bedridden or elderly individuals without caregivers.

Although drug delivery service was well accepted by hospital administrators as well as patients, pharmacists and other related staff reported that they had more workload from providing traditional outpatient dispensing services alongside drug delivery service. Providing two modes of services,

hospitals need more pharmacists and pharmacist assistants to perform extra tasks. They must also coordinate with physicians, nurses, information technology (IT) personnel, and cashier staff to ensure that patients have doctor visits at the appropriate time, meet the hospital's criteria for drug delivery service, have an online or onsite service at the appropriate time, and make a payment at the right time. In addition, the pharmacy department had to coordinate with the vendor to pick up the medicine parcels and investigate when the parcels were mismatched or not delivered. Moreover, the IT system, updated patient contact information, diagnosis, prescription, and dispensing, as well as cashiers, that support the activities should be properly maintained. Thus, if the hospital is committed to providing the service, the required resources will be well supported and maintained.

From the patients' perspective, although the drug delivery service is convenient, there is a delivery fee that must be paid out of pocket. Price-sensitive patients may choose to continue waiting a few more hours to pick up their medicines. The proportion of patients who utilised drug delivery services may have decreased.

Prescription refill at the hospital was an alternative service with a slight discontinuation rate, e.g. 0% in tertiary hospitals, 6% in university hospitals, and 10% in secondary hospitals. Those who plan to continue this service stated that (1) patients spend much less time at hospitals by skipping physician visits, (2) this service can be used in combination with the drug delivery service so that patients can avoid unnecessary hospital visits, and (3) the service does not require an extra workload.

The con of the service is that it still requires good collaboration between hospitals and patients to smooth the service. The prescription refill required patient screening to ensure that the patients were qualified for prescription refill service. Pharmacists or nurses must schedule an advance appointment to allow a screening process and extra time to prepare for the refill medicines.

The hospital-community pharmacy network was reported to be highly utilised by tertiary hospitals, as 67.7% of them planned to continue the service after the pandemic. The main reason often provided by the management pharmacists was the method was the NHSO-recommended policy to divert patients from hospitals to community pharmacies to solve crowded hospital problems. It was also highly supported by the Pharmacy Council. In addition, the patients responded very well, as they usually stated that they had more time to discuss their illness and medicines with the pharmacists. Hospital pharmacists reported that many drug-related problems were identified and provided feedback to them by community pharmacists. However, the decision to continue the service was made by hospital administrators and pharmacists, who usually provide services that comply with hospital policy.

Although the hospital-community pharmacy network has long been implemented, the key problem regarding reimbursement for drug products has not yet been resolved. A proper payment method is needed to expand the service countrywide and ensure the sustainability of the service. Most community pharmacies were located either in urban rather than rural areas or nearby contracted hospitals.

Discussion

This is the first study providing an outpatient dispensing service landscape before, during and after the COVID-19 pandemic in Thailand. The information from this study can serve as a new baseline for outpatient dispensing service in Thailand in 2022. Additionally, the results from this study can be used to improve each alternative service that is planned to continue.

All alternative outpatient dispensing services require clear scopes and criteria for implementation. Different alternative services have different criteria. Prescription refill encompasses the broadest disease scope, as it depends on physicians' decisions. Drug delivery service has broader scopes because they cover noncommunicable diseases than hospital-community pharmacy networks, which cover only four diseases: diabetes, hypertension, psychotic disorder, and asthma (Hfocus team, 2020a, 2020b).

Drug delivery service was widely implemented across hospital settings. Similar scopes and criteria were reported; however, they were not standardised. After implementation, questions regarding extra conditions and additional drug items were raised for further consideration. The expansion of disease conditions and related drugs has made the scope and criteria of each hospital vary.

Stable psychotic patients or patients under palliative care may also benefit from drug delivery services. However, controlled substances and narcotic drugs are under strict Thai Food and Drug Administration (FDA) regulations. Before COVID-19, these groups of medicines were allowed only face-to-face dispensing; however, during the COVID-19 pandemic, the Thai FDA allowed a one-month supply of these drugs via drug delivery service (Ministry of Public Health, 2020). Considering the continuation of the drug delivery service, which may include both controlled substances and narcotic drugs, updated regulations and clear practice guidelines are needed for both hospitals and vendors. Notably, in the United States (US) and the United Kingdom (UK), controlled substances, although strictly controlled, are allowed under specific conditions. In the US, controlled substances can be domestically mailed if both mailers and receivers are registered with the Drug Enforcement Administration (DEA) or are exempt from DEA registration. Authorised entities (e.g. registered pharmacies, medical practitioners, or authorised dispensers) can also mail controlled substances. All stakeholders must participate

in mail-back programmes (USPS, n.d.). In the UK, prescribed controlled drugs can be transported to patients' homes under certain conditions. The medication must be sealed in a tamper-evident container. They can be transported by porters, transport staff, or by post via recorded delivery. Upon delivery, the patient should receive controlled drugs (Parekh et al., 2019).

Because drug products are different from ordinary food and goods, they should be handled in compliance with good storage and good distribution practice guidelines. To ensure the quality of the drug products delivered, vendors should adopt and comply with these guidelines. Vendor inspection and audits are recommended. In other countries with stringent drug regulatory agencies, good storage and good distribution practices, including drug delivery services, are required for pharmaceutical products throughout their product life cycle (NHS Greater Glasgow and Clyde, 2008/2024).

In addition to solid dosage form drugs, liquid- and temperature-sensitive drugs were excluded from drug delivery service in Thailand. Most delivery vendors refuse to deliver large volumes of liquid drugs due to their weight and risk of breaking. Temperature-sensitive drugs are more feasible for drug delivery service, and cold chain logistic providers are available. Handling temperature-sensitive drugs by a professional service vendor may be better in terms of product quality than patients' self-handling (Hfocus team, 2020a).

Provision of the prescription refill was reported to slightly decrease in university, secondary and primary hospitals but remained unchanged among tertiary hospitals. This alternative, once implemented, should be easy to be continued because the criteria are predefined, the refill decision is based on the physicians, and extra hospital resources are not needed. To establish a prescription refill as an official outpatient dispensing service, professional organisations and hospital accreditation organisations should be involved. Concerns regarding patient eligibility for this service and the potential for neglecting acute conditions demand further attention (Dilokthornsakul et al., 2014). The utilisation of this service can be complemented by drug delivery services, thus minimising unnecessary hospital visits and enhancing efficiency.

The hospital-community pharmacist network model has been in place since 2015, but the adoption rate was low, and it was an option only for eligibility under the NHSO scheme. During the COVID-19 pandemic, 76.5% of tertiary hospitals utilised this method, and 67.7% continued to use it post COVID-19. Although it was perceived as a strategy to reduce overcrowding in hospitals, it also allowed patients to discuss their health and medication with community pharmacists, who help detect and resolve drug-related problems. However, related stakeholders need to better prepare supporting systems (Hfocus team, 2020b).

First, the NHSO must explore appropriate payment mechanisms for drug dispensing service delivered by community pharmacies. Previously, the

NHSO bundled payments to hospitals for both physician visits and medicines using capitation methods. Thus, when expanding drug delivery services to community pharmacies, hospitals had to bear the drug product cost. The NHSO paid 80 Baht per patient to community pharmacies for dispensing medications. Thus, to expand the model, this problem needs to be fixed. Second, community pharmacies are facing higher drug costs due to low bargaining power. This problem needs to be properly addressed among drug manufacturers, NHSOs, and community pharmacies, especially independent pharmacies (National Health Security Office, 2024).

Although hospitals reported that they were likely to continue providing alternative outpatient dispensing services at a high rate, the number of patients who actually utilised the service may have dropped. Additional data may be needed for future decisions.

The results revealed that different alternative approaches were appropriate for different hospital types in different locations. In urban areas, where people are surrounded by heavy traffic and live a rushed lifestyle, drug delivery services are well embraced. On the other hand, patients utilising smaller hospitals in the provinces preferred face-to-face service. They preferred to go to hospitals, have direct conversations with doctors and nurses, and use hospitals as places for socialisation among patients and caregivers. In addition, other existing services, such as sub-district hospital networks and village health volunteers, are effective strategies that can be utilised in special circumstances or specific target populations. This aligns with global trends observed in many healthcare systems facing similar challenges during the pandemic (Chu et al., 2023; Wise et al., 2022).

Although this study revealed the landscape of outpatient dispensing services in Thailand before, during and after the COVID-19 pandemic, there are several limitations. First, the study only revealed findings from hospitals in the government sector, excluding the private sector. Second, the study was conducted a few months before the announcement of lifting the COVID-19 pandemic status. The decision to continue providing services may be overestimated. Third, this survey collected data only from administrative pharmacists; however, the decision to continue the services should be based on broader stakeholders' perspectives, such as hospital administrators, doctors, nurses, and patients. Further studies should be conducted to address more current outpatient dispensing situations and cover broader stakeholders' perspectives (including patients, clinicians, and policymakers) to gain a more nuanced understanding of the factors influencing the sustained effectiveness and equitable access to these vital services. If patients must pay out of pocket for alternative outpatient dispensing services, their willingness to pay should also be explored. The additional administrative cost should also be studied.

Low- and middle-income countries may benefit from this study. They can choose alternative outpatient dispensing service models that fit their

countries' contexts. However, implementation should be concerned with the number of patients, health professional manpower, related regulations and other infrastructure.

Conclusion

This study provides a landscape of outpatient dispensing services among hospitals in the government sector only. Before the COVID-19 pandemic, alternative dispensing services were more commonly utilised by large hospitals than by smaller hospitals. However, during the pandemic, nearly all hospitals adopted drug delivery services in line with government policies encouraging people to stay home.

The COVID-19 disruption has shaped a new paradigm for hospital outpatient dispensing services. It catalysed services such as drug delivery, prescription refills, and the hospital-community pharmacy network, which had been implemented elsewhere long ago, to become a new normal service in Thailand. Although the pandemic was lifted, to continue these services should be carefully re-evaluated. Patients' needs, staff workloads, scopes and criteria, supporting IT systems and personnel, and related regulations and practices should be considered. To continue providing alternative hospital pharmacy outpatient dispensing services, some law should be updated to facilitate the activity.

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Author contributions

Pol. Maj. Trisak Chetsurakarn (TC) contributed to conceptualisation, methodology, investigation, data curation, formal analysis, writing (original draft), writing (review and editing), visualisation, project administration and funding acquisition.
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Ethics approval and consent to participate

The Research Ethics Review Committee for Research Involving Human Research Participants, Group 1, Chulalongkorn University, Thailand approved our interviews (approval: COA No. 104/65) on 18 May 2022. Respondents gave verbal consent before starting interviews.

Data availability statement

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Appendix

Table A1. Question guide for telephone interview.

Measurement	Parameter
Part I: Hospital Outpatient Dispensing Service Pattern	

Which types of the outpatient dispensing services are provided in your hospital? *(Answers all that applied)*	• Traditional hospital dispensing service
	• Refilled prescription at the hospital pharmacy service
	• Home delivery pharmacy service
	  ◦ Mail by Thai post
	  ◦ Mail by private transportation e.g. KERRY etc.
	  ◦ Hospital messenger
	  ◦ Private messenger e.g. GRAB etc.
	  ◦ Village health volunteers (VHV)
	  ◦ Others (Please specify)
	• Registered GPP community pharmacy linked with the hospital service
	• Sub-district health promoting hospital linked with the hospital service
	• Drive-thru pharmacy service
	• Others (Please specify)

When did the alternative outpatient dispensing services start? And why the hospital implemented the service(s)?	Open-ended (MM-YYYY) Open-ended (Reason)
Part II: Opinions on the Alternative Hospital Outpatient Dispensing Services	
In your opinion, should the hospital provide alternative outpatient dispensing services after the COVID-19 situation ends? And why?	• Yes (Reason) • No (Reason)
Is the hospital intending to provide alternative outpatient dispensing services after the COVID-19 situation ends? And how?	• Yes (Specify) • No (Specify) • Not sure (Specify)
Part III: General Information of the Hospital	
On average, how many outpatient prescriptions does your department receive each month?	Open-ended (Number)
During office hours, how many outpatient pharmacists are on duty? (Full-time and Part-time)	Open-ended (Number)
During office hours, how many outpatient pharmacist assistants are on duty?	Open-ended (Number)
Does the hospital have a network of services (such as a hospital or pharmacy) to refer or receive referrals? And what?	• Yes (Specify) • No
Does the hospital provide the Telehealth service? And what?	• Yes (Specify) • No

ภาพประกอบบันทึกขอสำเร็จการศึกษา

บันทึก ขอสำเร็จการศึกษา ปีการศึกษา 2567 ภาคการศึกษา 2 เมื่อวันที่ 16/02/2568 เรียบร้อยแล้ว

นิสิตสามารถสอบถาม การตรวจสอบข้อมูลนิสิต ตามที่ได้ยืนยันความถูกต้องแล้ว
หากมีแก้ไข/เปลี่ยนแปลง ข้อมูลใดๆอีก ให้ติดต่อ สทป. เพื่อแก้ไข
พร้อมแสดงหลักฐาน(ถ้ามี) ก่อนที่คณะจะประกาศสำเร็จการศึกษา

เพื่อประโยชน์ของนิสิตควรสอบถามข้อมูลในหัวข้อ คำแนะนำการติดตามเรื่องการสำเร็จการศึกษา

ยกเลิก ขอสำเร็จ / Cancel Graduation Request

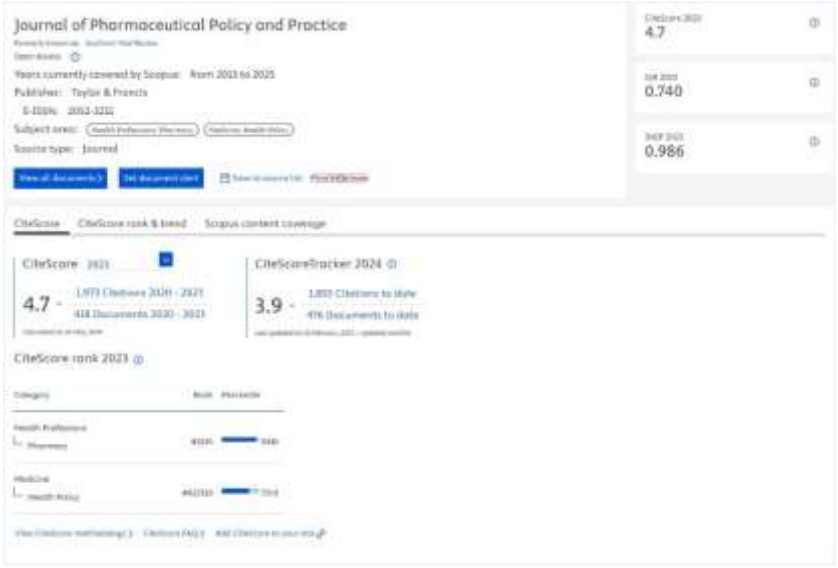
Record of Request for Graduation For Academic Year 2567 Semester 2 date 16/02/2025 has been completed

Students can check Student Information Check which has been updated.
If students wish to correct/change any information, they should contact the Office of the Registrar and produce evidence (if any) before the faculty posts the name list of graduates.

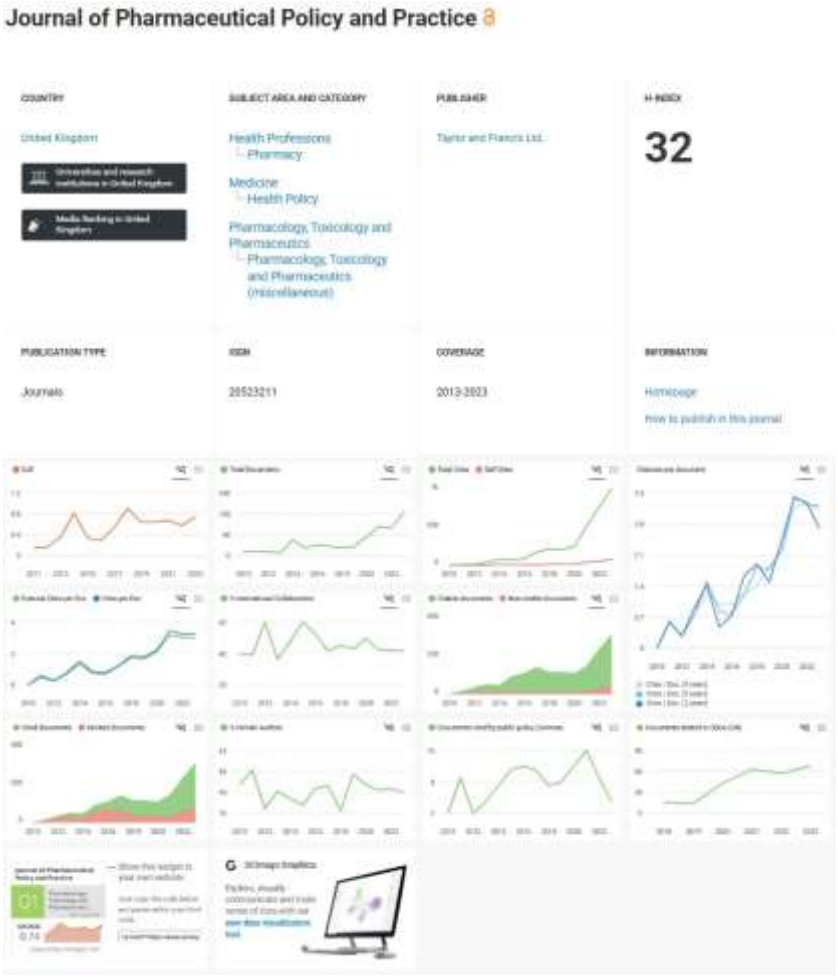
For students' benefit, students should check the information under the menu
Advice on Follow-up of Graduation.

ภาพประกอบคุณภาพวารสาร

Scopus



Scimago Journal & Country Rank



ภาพประกอบการประชาสัมพันธ์ผ่านช่องทางสื่อสังคม

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