

# Comparative analysis of pharmacy education systems in Thailand and Japan: implications for competency and curriculum reform

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## ABSTRACT

While Thailand and Japan both mandate a six-year Bachelor of Pharmacy degree, their organizational structures and pedagogical approaches diverge significantly. Given the absence of comparative analyses in existing literature, an examination of the disparities between these systems is crucial for informing future reforms aimed at enhancing pharmacy competency. This research endeavors to compare pharmacy education in Thailand and Japan across three key domains: academic programs, training initiatives, and licensure examinations. A document analysis was conducted to collect relevant educational policies and curriculum frameworks from both countries. The study reveals that Japan places greater emphasis on research in the final year and stipulates fewer credit hours, whereas Thailand prioritizes practical internships. Furthermore, Japan maintains a certified preceptor program, a feature absent in Thailand, and the respective licensing examinations differ in format, with Japan employing exclusively multiple-choice questions while Thailand incorporates both competency tests and practical assessments. Addressing these discrepancies is paramount for enhancing pharmacy education and harmonizing training protocols. Variations in curricula, instructional methodologies, and licensure procedures hinder the standardized implementation of the Pharm.D. degree and impact on the pharmacy workforce and healthcare infrastructure in both countries.

**Keywords:** Pharmacy, Pharmacy education, Pharmacy license, Pharmacy curriculum

## Introduction

Pharmacy education across the ASEAN (Association of Southeast Asian Nations) region exhibits significant diversity, reflecting the

varying healthcare needs, regulatory frameworks, and educational infrastructures. Basic pharmacy degrees typically last between four and six years, and the program lengths and structures vary greatly. Professional licensure tests and educational modalities differ by nation. Only Thailand within the ASEAN group offers a six-year pharmacy program [1]. The ASEAN Plus Three region and neighboring nations like China, Korea, and Japan demonstrate that although China started a six-year pharmacy curriculum in 1999, it is not accessible nationwide [2]. Korea has had a "2+4" year program since 2009 [3]. Japan has used a 6-year program since 2006 [4]. Taiwan offers pharmacy programs that are 4, 5, or 6 years long, with the 6-year option starting in 2009 [5].

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A collaboration between US and Thai pharmacy educators in 1993 resulted in Naresuan University offering the Pharm.D program in 1999, the first in Asia [6]. Subsequently, the Pharmacy Council mandated a six-year education for all pharmacists' licenses by 2014 [7]. Thailand's PharmD program has been adapted from the US version to include industrial pharmacy, public health, and clinical pharmacy tracks to better meet the country's needs [6, 7]. However, when graduates started working, 42% felt that their jobs did not match their skills and training [8].

Japan started a four-year program for pharmaceutical manufacturing in 1873. In 1980, the Japan Pharmaceutical Association suggested a six-year pharmacy education. In 2002, the Pharmaceutical Society of Japan approved a basic curriculum for pharmacy studies. In 2006, they added two new options: a four-year pharmaceutical sciences program and a six-year pharmacy program. The pharmaceutical sciences degree is recommended for students who want to work in research, but they are not qualified to work as pharmacists [4]. Almost 6-year pharmacy graduate students in Japan also stated that they did not have adequate interpersonal and managerial skills, knowledge, or training before graduation [9].

Pharmacy education varies in different countries because of their culture, economy, healthcare systems, and schools. So far, no one has compared how pharmacy programs are organized and what skills are taught in Thailand and Japan. This study will compare pharmacy education in both countries in three areas: study programs, training programs, and licensing exams. The results will help initiate discussions about developing a six-year pharmacy program that emphasizes important professional skills. Good pharmacy education and training are essential to ensure there are enough skilled pharmacists to support healthcare needs.

### Ethics approval

The study protocol was approved by the Ethical Research Committee of the Faculty of Pharmacy, Chiang Mai University, under Study Protocol No. 004/2564/F, on November 18, 2021.

## Materials and Methods

This research uses document analysis focusing on three key areas: study programs, training programs, and pharmacy license exams. In order to organize the data using theme analysis, we first looked for and examined papers pertaining to pharmacy education in both Thailand and Japan. A framework for the findings was created using data from institutions in both nations that are involved in pharmacy education and licensing.

We conducted literature searches in PubMed and ScienceDirect using the keywords "pharmacy education" or "pharmacy curriculum" along with "Thailand" or "Japan." Only articles written in English were reviewed. Additionally, we conducted hand searches of both print and online sources related to education and pharmacy licensure. The primary researcher analyzed all the data and created initial comparison topics. Then, a second researcher independently reviewed the data. Any disagreements were discussed until a consensus was reached. Finally, the research team reviewed data to ensure it was accurate and clear.

## Results and Discussion

### Standard of pharmacy education program

The six years of university education, including practical training, are required in both Thailand and Japan in order to become a fully trained pharmacist, see **Figure 1**.

Program Year	Pharmacy Education Program			
	Thailand		Japan	
1	6 years Doctor of Pharmacy		4 years Bachelor of Pharmaceutical Sciences	
2				
3				
4			6 years Bachelor of Pharmacy	
5				
6				
7	2 years Master's Degree	3 years Doctoral Degree		
8	4 years Doctoral Degree			
9	4 years Residency Program	4 years Doctoral Degree		
10	3 years Doctoral Degree			
11	3 years Doctoral Degree			

**Figure 1.** Pharmacy education systems in Japan and Thailand [4, 7].

The Thai Qualifications Framework (TQF) and the Pharmacy Council of Thailand (PCT) determine and control the quality of Thailand's basic curriculum framework [6, 7]. Only the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) in Japan has responsibility for pharmacy curriculum, while the Japan Accreditation Board for Pharmaceutical Education (JABPE) controls quality [10, 11]. **Table 1** provides a systematic

comparison of the educational regulatory agencies in Thailand and Japan. The minimum credits required for the six-year pharmacy degree are shown in **Table 2**. An assessment of graduate skills in Thailand's industrial pharmacy track might be necessary because of growing tuition costs, preceptor site accreditation, and institution and student expenditures.

**Table 1. Systematic comparison of educational regulatory bodies between Thailand and Japan.**

Domains	Thailand [7, 12, 13]	Japan [4, 14-16].
<b>A body in charge of the curriculum</b>	Pharmacy Council of Thailand (PCT) and Thai Qualifications Framework (TQF)	Ministry of Education, Culture, Sports, Science and Technology (MEXT).
<b>An agency for quality control</b>	Office of the Higher Education Commission and PCT's education committee	Japan Accreditation Board for Pharmaceutical Education (JABPE).
<b>Pharmacy schools</b>	20 pharmacy schools (14 public and 6 private)	77 pharmacy schools (14 national, 5 public, 58 private)
<b>Total credits in the curriculum</b>	220 credits	190 credits *
<b>The common achievement tests before Introductory Pharmacy Practice Experience (IPPE)</b>	Students must complete all required courses (individually determined by the pharmacy school) before undertaking practice at each university.	The Pharmaceutical Common Achievement Test (PhCAT) is taken at the end of the fourth year.
<b>Introductory Pharmacy Practice Experience (IPPE)</b>	At least 200 hours (5 weeks each in community pharmacy and hospital).	22 weeks (11 weeks each in hospital and community pharmacy).
<b>Advanced Pharmacy Practice Experience (APPE)</b>	At least 1,600 hours in 42 weeks (six-week clerkships; 6-7 rotations depending on curriculum).	The additional core coursework is specific to pharmacy school.
<b>Training site management</b>	National survey assigns core clerkship programs; universities manage special track clerkship.	Training sites selected by universities and pharmacy organizations.
<b>Pharmacy preceptor</b>	Volunteer or organization-assigned, ≥2 years' experience, no certification scheme.	Required certificates plus lectures/workshops.
<b>Training fee</b>	≈3,000 THB (≈USD 89) per student per 6-week rotation to the preceptor's organization.	300,000 JPY (≈USD 1,923) per student per 11-week cycle to the pharmacist.
<b>Licensing exam authority</b>	Pharmacy License Exam Center	Ministry of Health, Labour and Welfare of Japan
<b>Licensing exam schedule.</b>	3 times a year	Once a year
<b>Format of core competency test</b>	Fifth-years: MCQs and OSPE.	Graduate students: MCQs.
<b>Format of competency test for specialty track<sup>#</sup></b>	The graduate students will take MCQs and Long case discussion <sup>§</sup>	-

MCQ; Multiple Choice Questions, OSPE; objective structured pharmacy examination

\* Case study of the School of Pharmaceutical Science, Nagasaki University

\*\* Rate of currency exchange (on 25 January 2025) 1 USD = 156 JPY, 1 USD = 33.61 THB

<sup>#</sup> Specialty tracks consist of Pharmaceutical Care (PC), Industrial Pharmacy (IP), Pharmaceutical and Health Consumer Protection (PHCP)

<sup>§</sup> detail depended on the track

**Table 2. Minimum credits needed for the six-year pharmacy program.**

Domains	Amount of credits for the 6-year pharmacy program	
	Thailand (2018 version) [7, 8]	Japan (2015 version*) [14, 17]
Liberal arts education	30	30
Specialized pharmacy education	120	109
Professional practice	34	34
Basic practical training	-	10
Pre-practical training	-	4
Practical training in hospital and community pharmacy	6	20
Specialty track practice	28	-
Free electives	6	0
Research	3	15
Seminar	0	2

Total

220

190

\*Case study of the School of Pharmaceutical Science, Nagasaki University

### Study program in Thailand

Currently, 20 pharmacy schools in Thailand are approved by the Pharmacy Council that offer a 6-year Doctor of Pharmacy Program in pharmaceutical science, consumer protection, and/or pharmaceutical care [6]. The minimum number of credits needed is 220. Professional courses must be at least 114 hours and comprise at least 15 credits from the specialization track, as well as at least 30 credits each from the pharmaceutical sciences, pharmaceutical care, and social and administrative pharmacy. They will complete the core competency test and a 400-hour core clerkship after their fourth year. A minimum of 1,600 hours of the sixth academic year were spent in specialized clerkships [7].

### Study program in Japan

In Japan, the four-year pharmaceutical sciences program, a two-year master's degree, and a three-year doctoral program have all concentrated on chemistry and researcher education, resulting in substantial advancements in medication discovery in the pharmaceutical companies. Graduates who want to become pharmacists must complete a six-year clinical pharmacy curriculum [3]. Now, 79 Japanese colleges only recommend a 6-year bachelor's degree in the Pharmacy program. Each institution is required to offer 70% of the total credits in the core curriculum]. The seven categories of the model core curriculum are: Pharmaceutical Education Philosophy, Pharmaceutical Sciences in Society, Pharmaceutical Science Fundamentals, Health and Environmental Sciences, Therapeutics: Clinical Pharmacology and Pharmacotherapy, Pharmacy Practice, and Research [4].

Pharmacy students will begin with fundamental sciences, liberal arts, and basic pharmacy in their first and second years. Third-

year students begin laboratory research. During their fourth year, students must complete pre-rotation clinical training at a university lab. The Pharmaceutical Common Achievement Tests (PhCAT) must be passed before beginning practical training.

### Professional training

Japan requires a qualifying exam before 11 months of fifth-year pharmacy training [4], while Thailand includes a five-week training program before the fifth year and mandates seven practical rotations for sixth-year students [7]. The significant importance preceptors play in pharmacy education is highlighted by the lengthy internship hours needed. However, Thailand lacks accredited programs or courses to certify pharmacy preceptors' professional development, in contrast to Japan. As a result, the preceptor's ability to evaluate the pharmacy student's specialized competencies was called into question.

### Training program in Thailand

Before students begin their fifth year, each hospital and community pharmacy training program lasts five weeks. Students will gain knowledge of pharmaceutical activities, organizations, and operations in a community pharmacy and hospital by engaging in a practical traineeship. Sixth-year pharmacy students must complete seven practical rotations, with each clerkship having a six-week training session [7]. Students will participate in journal clubs, SOAP notes, and other activities. Many preceptors are now volunteers, with a heavy commitment. There was no proof of training site accreditation being discovered. Professional regulating organizations may need to reconsider this issue [6]. (Table 3).

Table 3. Practical training for pharmacy students in Thailand [7].

Program Year	Practice hours	Rotations	Track: Pharmaceutical Care	Track: Social pharmacy	Track: Pharmaceutical Sciences	
4	At least 400	2	Core clerkship in hospital and community pharmacy			
		2-3	Elective clerkships in a hospital, e.g., oncology, pediatric care, therapeutic drug monitoring, etc.	Elective clerkships in community pharmacy or primary care	Elective clerkships in consumer protection, marketing, administration, and management, etc.	Elective clerkships in industrial pharmacy, e.g., production, quality control, drug registration, research and development, etc.
6	At least 1,600	1	Medication management system clerkship	Consumer protection clerkship		
		1	Acute care/medicine clerkship			
		1	Ambulatory care clerkship		Consumer protection clerkship	Quality assurance/ quality insurance clerkship
		1	Community Pharmacy/ Primary care clerkship			Production clerkship

### Training program in Japan

Students must pass the Pharmaceutical Common Achievement Test (PhCAT) before beginning their 11-month practical training in hospitals and pharmacies in their fifth year [4]. The PhCAT

consists of an Objective Structured Clinical Examination (OSCE) to assess their skills and attitudes to hands-on or simulated testing with standardized patients. Computer-Based Testing (CBT) assesses their knowledge based on the model core curriculum

[11, 18]. Two rotations will be exposed to each of the eight primary diseases: cardiovascular diseases, diabetes, respiratory disease, infectious diseases, neurological disorders, gastrointestinal disorders, musculoskeletal disorders, and endocrine disorders [11].

To become a preceptor, pharmacists must complete a series of certified lectures and workshops. The course covers pharmacy philosophy, pharmacy education, the core curriculum, and practical guidelines. Students are evaluated during their rotation using the national scoring rubric. Two assessors grade each student: one faculty member and one preceptor. After finishing professional training, Japanese pharmacists must also earn research credits [15, 16].

### *Pharmacy licensing examination*

After completing the 6-year curriculum, students who desire to work as pharmacists in both countries must pass the professional license exam. This is because a licensed pharmacist can work in public health organizations, hospitals, community pharmacies, academic and research institutes, pharmaceutical corporations, and wholesalers. In Thailand, candidates must pass both the core competency test and the specialty track competency test. **Table 1** compares pharmacy licensure examinations in Japan and Thailand [4, 6, 7, 15, 17, 18]. Every year, around 1,700 pharmacy students in Thailand complete licensed tests, accounting for 85% of all graduates [6]. In Japan, 8,548 graduates at the National License Examination for Pharmacists in February 2023. Students were only needed to answer multiple-choice questions (MCQs), and 84.86% passed [18].

### *Professional licensing in Thailand*

The Pharmacy Council of Thailand implemented a policy in 2008 that a 6-year PharmD would be compulsory for pharmacy licensure starting in 2014. [6]. The core competency licensure examinations include multiple-choice questions (MCQs) and an observation structured pharmacy examination (OSPE) in eight domains. The MCQ pass rate is 60%, whereas the OSPE success rate is 80%. Examination covers the topic in pharmaceutical science, pharmaceutical care, and social and administrative pharmacy [19].

### *Professional licensing in Japan*

The Japan Accreditation Board for Pharmaceutical Education independently oversees pharmacy school accreditation. Exams are held once a year in February at eight regional sites. The licensure exam consists of MCQs covering physics, chemistry, biology, pharmacology, pharmaceuticals, hygienic pharmacy, pathophysiology, pharmacotherapy, and regulations. Six tests over two days total 345 questions, with a maximum score of 690. Since 2018, passing criteria have been based on statistical adjustments (mean and standard deviation). Candidates must surpass the determined threshold, score at least 70% on essential questions, and earn at least 30% of points in each subject [18].

The commentary discusses whether the future of clinical pharmacy practice in the USA is too narrow. It highlights that the evolving healthcare landscape will present more difficulties for pharmacists, necessitating a more expansive and integrated position. Their contributions might be limited if they just take up traditional duties [20]. Therefore, pharmacy education and practice must evolve by adopting new roles, expanding responsibilities beyond medication dispensing, and preparing pharmacists to address diverse health needs. The overall message is that pharmacies must embrace a wider vision to successfully meet future healthcare demands [21]. In Thailand, a six-year program broadens focus areas to include clinical, pharmaceutical, and consumer protection tracks, supporting this expanded vision [7].

While the consumer protection track is unique to Thailand, the curriculum includes only 15 credits in social and administrative pharmacy, which is half the credits allocated to pharmaceutical care or sciences. There is also no data available on how well students are prepared. In contrast, pharmaceutical care, another major component of pharmacy education, has less than 20% of academic staff serving as role models in patient care services in real practice settings like hospitals or community pharmacies, and only about 2% of faculty members have completed clinical residencies [6]. This calls into question the need for the three unique tracks, which are hindered by institutional constraints and a failure to integrate healthcare system elements [6]. Many graduates feel their skills are not aligned with their roles, with nearly half believing their expertise is unsuitable. Interestingly, industrial pharmacy graduates have outperformed pharmaceutical care students in overall professional competency [10]. The impact on Thailand's clinical pharmacy workforce, in both quantity and quality, remains uncertain [22].

In Japan, graduates aspiring to become pharmacists must complete a six-year clinical pharmacy curriculum, while those pursuing careers in the pharmaceutical industry follow a four-year program. This distinction allows for a more focused curriculum in the industrial sector [4]. All pharmacy schools in Japan recently accredited by JABPE were mostly praised for improvements in the basic content of medical professional education, training to develop problem-solving skills, and standards for grading, promotion, and graduation [10]. So far, social pharmacy in Japan has played an important role in training pharmacists for community-based programs, which are especially important for supporting an aging society [23]. In comparison, Japan's six-year program allocates 28 fewer credits to specialized track practice than Thailand. As a result, some Japanese students have never observed how pharmacy services relate to the core curriculum. In 2019, only 9% of pharmacy students had the opportunity to learn about all eight major diseases [24].

While completing the requirements of pharmacy school is difficult, passing the national licensing exams for pharmacy is extremely difficult. Offering two distinct tracks of pharmacy education—a four-year pharmaceutical sciences course and a six-



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