







REVIEW

# Certificates and certification programmes for clinical excellence: A guide to international pharmacists

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## Keywords

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## Abstract

Pharmacy practice continues to evolve, and knowledge update is necessary to facilitate better and safer patient care. This article provides information about certificates and certification programmes hosted for international pharmacists to support their scope in advanced pharmacy practices. A pilot online survey to 59 pharmacists revealed preferences towards Board of Pharmacy Specialties (BPS), American Society of Health-system Pharmacists (ASHP) certificate, Society of Infectious Diseases Pharmacy (SIDP) Antimicrobial stewardship certificate programmes, University of Florida pharmacy certificate programmes, and Medication therapy management programme (MTM) for their certification programme. Grey literature and authentic websites of each programme were collected to provide information on each programme. This article serves as a guide for international pharmacists to know further information about certificates and certification programmes available to support them in advancing their practice.

## Introduction

Demand for improved human life has advanced the healthcare sector, and the concern for enhancing physiological wellbeing has enrooted to medical reforms. Healthcare professionals being the identifier, detector, and healer is inevitable as there are high diseases prevalence with varying fatality around the world. The current era of the COVID 19 pandemic has brought widespread challenges for researchers and healthcare providers (Abd El-Aziz & Stockand, 2020). However, because of the continuous and timely effort, the situation became somewhat under control.

Machines and information technologies are invading human resources due to their efficiency and tireless work potency, often utilised in multi-speciality hospitals. The current healthcare system has advanced robotic gadgets for continuous monitoring, surgeries, and medication segregation and dispensing. However, there are disciplines where computers fail (Kaiser *et al.*, 2021). The professionalism and skill of healthcare providers can't be replaced with automated and programmed devices. Moreover, medical professions have to modulate their communication tone in a certain situation, especially while educating patients and the public, which electronic devices cannot (Rahman *et al.*, n.d.; Siddique & Chow, 2021).

The pharmacist's role has changed drastically over the decades from simply dispensing the medicine to who works side by side with the physician, nurses, and other health workers to ensure patients' safety and efficacy (Blouin & Adams, 2017). Enhanced team-based care and interdisciplinary education are principal components to the attainment of patient-centred care. Readmission to hospitals is often linked to poor transitions of care and inappropriate medication use (Glans *et al.*, 2020). This emphasises the relevance of integrating clinical pharmacy care that nullifies adverse events and optimises client compliance, and pharmacists can strengthen the bond with highly emotionally and physically vulnerable populations. The cost of misuse and overuse of medicine constitutes over 10% of the total healthcare cost (Ofori-Asenso & Agyeman, 2016). Besides financial burden, the psychological and physiological consequences may prevail to varying extents. In addition to the pharmacist's contribution in hospital settings, community pharmacy is closer to society and open for outpatient care. The perception of ordinary people about pharmacists had changed, invented for focusing on various health services on both individual and community basis (Rodgers *et al.*, 2016).

The pharmacist employed in various specialities should abate the complication generated by irrational utilisation of medicine. They should be competent enough to stand professionally alive and show their value to society. The performance of healthcare workers is always crucial for a nation, and its extension would determine the level of the country's healthcare competency (Kak *et al.*, n.d.). To offer a better health sector, the pharmacist should update and gain more credentials (Zogas *et al.*, 2021). The proficiency they acquire from their pharmacy school would not be adequate. Considering the current challenges in the profession, if pharmacists have a certification in a particular area, they will be able to market themselves as vital clinician in the healthcare system. Both employers and patients will be willing to pay for their skills to provide an exceptional service to them in dealing with their disease state. When medical professional signs up for studying medicines, it should be a lifetime learning process. This brings a perfect future to pharmacists and the profession, and luckily there are a wide variety of pharmacy knowledge enhancement programmes that offer certificates and certifications. Here, the article presents some major certificate and certification programmes available globally, which would aid the pharmacist as a quick reference for pursuing the same.

## Methods

### Design

A grey literature search through Google Search Engine and authentic websites yielded data to inform the content of this article.

### Sample and data collection

Numerous add-on courses specific to international pharmacists were identified. Official websites of reputed authorities that issue pharmacist's quality improvement programmes were browsed. The search term employed were 'pharmacy certificate', 'certification programme', and 'quality improvement', enhanced by Boolean operators.

A pilot survey was conducted through google form among 59 international pharmacists working in gulf countries. Ninety-five per cent of the total pharmacists had limited (73%) or no (22%) awareness of such credentials. This was a significant concern that they felt was important for gaining more information. The responses obtained showed preferences towards Board of Pharmacy Specialties (BPS) (83%), American Society of Health-system Pharmacists (ASHP) certificate (69%), Society of Infectious Diseases Pharmacy (SIDP) Antimicrobial stewardship certificate programmes (56%), University of Florida pharmacy certificate programmes (53%), Medication therapy management programme (MTM) (30%) and others (0.03%). Accordingly, the following internet sites concerning BPS, ASHP, SIDP, University of Florida, and MTM were searched, and data retrieved were the eligibility criteria, description of the programmes, topics covered, fees, and other essential particulars.

Relevant peer-reviewed articles sorted had pointed out the international preferences and advantages of specific certificate and certification programmes. During the literature search, articles related to BPS (n=8), ASHP (n=8), antibiotic stewardship (n=1866), and MTM (n=275) were observed and collected from Google Scholar, Scopus, and PubMed, but six significant published works that met the criteria were extracted. Reputed certificates and certification programmes that would add value to the pharmacy practices and the pilot study were the primary concern for narrating the review. Despite the numerous pharmacy credentials across countries, BPS, ASHP, SIDP, University of Florida Pharmacy Certificate Programme, and MTM programme were focused here (Figure 1).

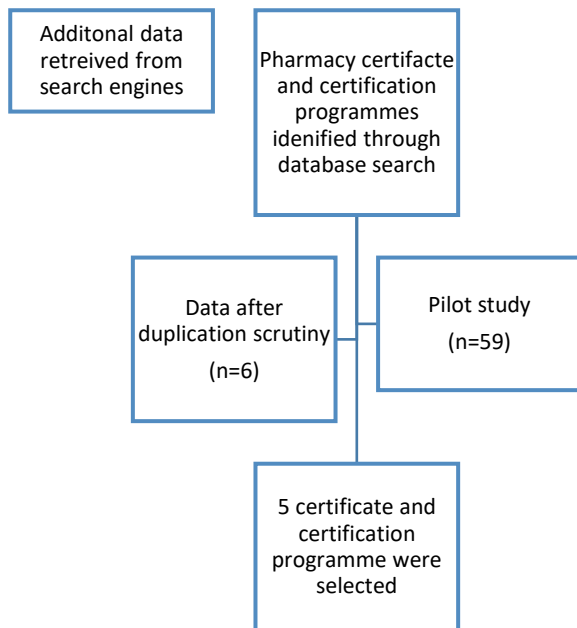


Figure 1: Flow chart specifying the review process

**Data analysis**

The information was analysed independently by all the authors and reviewed further for any discrepancies.

**Results**

The retrieved information concerning five certificates and certification programmes for international pharmacists were as follows:

**Board of pharmacy specialities**

The Board of pharmacy specialities (BPS) serves to advance the profession wherein competent pharmacists are originated. The main objective of specialisation was to cautiously create more focused care for a specific category of patients. Moreover, the BPS certified pharmacist would quickly sink with the other healthcare providers to attenuate and discuss medicine-related matters. The eligibility and recertification requirements are represented in Figure 2.

Eligibility for BPS certification	Prerequisite: Experience statements	Annual maintenance fees	Recertification examination	Continuing education
<ul style="list-style-type: none"> <li>•Applicant's country: Any</li> <li>•Applicant's qualification: Pharmacy degree</li> <li>•Experience: Minimum three years</li> <li>•Examination fees: 600 USD</li> <li>•Certification validity: 7 years</li> </ul>	<ul style="list-style-type: none"> <li>• Requires attestation from the employed institution enclosed in letterhead.</li> <li>•The practice experience stated should be within the seven years following the application.</li> </ul>	<ul style="list-style-type: none"> <li>•125 USD each year from one to six years.</li> <li>•Recertification after a period of 7 years - 400 USD should be paid.</li> </ul>	<ul style="list-style-type: none"> <li>• Constitute of 100 questions.</li> </ul>	<ul style="list-style-type: none"> <li>•Granted for pharmacists who had earned continuing education credit (100 hours) provided by APhA and/or the collaborated programme offered by ACCP and ASHP</li> </ul>

APhA-American Pharmacists Association; ASHP- American Society of Health-System Pharmacists

Figure 2: Board of Pharmacy Specialities pre-requisite and recertification procedures

BPS is offering certification programmes in different specialities to practising pharmacists depending upon their areas of interest (Board of Pharmacy Specialities (BPS) Homepage, n.d.). The following are the specialities (Table I).

**University of Florida certification courses**

Since 2011, the University of Florida College of Pharmacy at the United States, a fully accredited

pharmacy college by the American Council on Pharmaceutical Education, has offered several online graduate degree programmes (“University of Florida College of Pharmacy (Pharm. D.),” n.d.). The courses (Table II) are designed to maintain and improve professional competence in various practice settings and develop expertise in specialised areas to improve patient-centred care and healthcare delivery (Online Graduate Programmes, College of Pharmacy, University of Florida, n.d.).

**Table I: The salient features and requirements of Board of Pharmacy Specialities Programmes**

Streams in BPS certification	Certified pharmacists	Requirements	Content	Examination domains	% from total
Board Certified Ambulatory Care Pharmacist (BCACP)	>4800	Four (4) years of practice experiences *	Patient-Centered Ambulatory Care Utilization of Evidence for Ambulatory Care Practice Ambulatory Care Practice Advancement		75 15 10
Board Certified Critical Care Pharmacist (BCCCP)	>3000	Four (4) years of practice experiences *	Clinical Knowledge and their Application Practice Management, Policy, and Quality Improvement Evidence-Based Medicine, Scholarship, Education, and Professional Development		65 15 20
Board Certified Infectious Diseases Pharmacist (BCIDP)	>1100	Four (4) years of practice experiences *	Patient Management and Therapeutics Education, Research and Scholarship Antimicrobial Stewardship and Practice Management Public Health and Patient Advocacy		50 20 25 5
The Board Certified Paediatric Pharmacy Specialist (BCPPS)	>1300	Four (4) years of practice experiences *	Patient Management Practice Management Information Management and Education Public Health and Patient Advocacy		57 21 17 5
Board-certified Cardiology Pharmacist (BCCP)	>400	Four (4) years of practice experiences *	Patient Management and Therapeutics Information Management and Education Practice Development and Administration Public Health and Patient Advocacy		59 23 14 4
Board-certified Sterile Compounding Pharmacist (BCSCP)	>750	Four (4) years of practice experiences *	Standards, Regulations, and Best Practices Facilities, Equipment, and Environmental Control Compounded Sterile Preparations Patient Care Quality Management		20 20 25 25 20
Board-certified geriatric pharmacist (BCGP)	>4700	Two (2) years of practice experience* (Please note:**, ***not applicable)	General Principles of Aging Person-Centered Care Population and Public Health		20 60 20
Board Certified Nuclear Pharmacist (BCNP)	>400	An active licensed pharmacist with 4,000 hours of training or experience in nuclear pharmacy practice	Procurement, Storage, and Handling Preparation, Compounding, Repackaging, End-product Testing, and Dispensing Equipment and Environmental Requirements Licensing and Occupational Safety Drug Information and Professional Consultation		16 40 16 16 12
Board Certified Nutrition Support Pharmacist Specialist (BCNSP)	700	Completion of three (3) years practice experience*	Clinical Practice: Provision of Patient Centered Nutrition Support Tasks Practice Management and Operations Evidence-Based Medicine, Scholarship, Education, and Advocacy		67 26 7
Board Certified Oncology Pharmacist (BCOP)	>3500	Four (4) years of practice experience*	Pathophysiology and Molecular Biology of Cancer Therapeutics, Patient Management, and Education Clinical Trials and Research Practice Management Public Health		20 38 14 22 6
Board Certified Pharmacotherapy Specialist (BCPS)	>27600	Three (3) years of practice experience*	Patient-Centered Pharmacotherapy Application of Evidence to Practice and Education Healthcare Systems and Population Health		65 25 10

**Table I: The salient features and requirements of Board of Pharmacy Specialities Programmes (continued)**

Streams in BPS certification	Certified pharmacists	Requirements	Examination domains	
			Content	% from total
Board Certified Psychiatric Pharmacist (BCPP)	>1300	Four (4) years of practice experience*	Person-Centered Care	55
			Translation of Evidence into Practice and Education	30
			Healthcare Policy, Advocacy, and Practice Management	15
Board Certified Transplant Pharmacist (BCTXP)	-	Completion of four (4) years of practice experience*	Clinical Skills and Therapeutic Management	65
			Administration and Practice Development	15
			Information Management and Education	15
			Public Health	5
Board Certified Emergency Medicine Pharmacist (BCEMP)	-	Completion of four (4) years of practice experience*	Patient Care/ Management	75
			Practice Management	15
			Education and Research	10

The requirement is graduation from a pharmacy programme with an active license to practice pharmacy. The experience can be either of the following: 1) \*Job Experience; 2) \*\*Completion of PGY1 residency + 1-year practice; 3) Completion of a PGY2 residency in the same discipline. The information was collected from the website on 12 June 2021.

**Table II: Salient features and requisites of University of Florida certification courses**

Name of the certificate	Started on	Course benefit	Remarks	CE credit hours	Activity fees	Passing score
Collaborative practice agreement certificate programme	18 Feb 2021	Prepares the pharmacists to collaborate with a supervising physician as established by Florida law	This programme meets the requirements outlined in Section 465.1865	20 hours (12.0 hours self-paced; Eight-live, online)	USD 699	70%
Test and treat certificate programme	18 Feb 2021	Prepares the pharmacist to screen the patients and treat minor, non-chronic health conditions under the supervision of a physician	This programme meets the requirements outlined in Section 465.1895	20 hours (12.0 hours self-paced; Eight-live, online)	USD 699	70%
Implementing pharmacogenomics into the clinical practice certificate programme	11 Jan 2021	A self placed online certificate programme that enhances pharmacists with the knowledge essential to implement pharmacogenomics into pharmacy practice	This programme is approved by the Florida Board of Pharmacy for consultant pharmacist recertification credit	25 hours fully online	USD 699	N/A
Anticoagulation therapy management for pharmacists	30 Dec 2020	This programme helps to prepare the pharmacist to monitor and manage anticoagulation therapy	The programme helps the pharmacist to be equipped for the Certified Anticoagulation Care Provider (CACP) exam	18.5 hours fully online	USD 699	70%
Veterinary pharmacy for practising pharmacists	30 Dec 2020	Prepares pharmacists for legal counseling requisite, cautiously monitoring drug-related matters, and fill veterinary prescriptions with utmost safety	Designed for pharmacists interested in veterinary pharmacy	15 hours	USD 299	N/A

The information was collected from the website on 12 June 2021; N/A, Not available

### **American Society of Health-System Pharmacists (ASHP) offers certificate programmes**

The American Society of Health-System Pharmacists (ASHP) offers certificate programmes covering a broad scope of knowledge and skill in different practice areas (Table III). The ASHP professional certificates are a self-guided online programme that guarantees a high-quality, practical development opportunity for pharmacy practitioners. The learning modules are 100% online and presented in an easily understandable format. After completing each module, the participant

must pass a thorough exam and earn Accreditation Council for Pharmacy Education (ACPE) accredited continuing education credit for each module. Finally, ASHP shall issue the professional certificate. The primary area covered are clinical topics related to pharmacy practice, general learning units, and sterile compounding. Currently, ASHP offers 20 professional certificate programmes (Table IV) for practising pharmacists, and some more new certificate programmes are expected to be live shortly (Professional Certificate Programmes, n.d.).

**Table III: Merits of ASHP certification courses**

#### **Well-Being and Resilience Certificate**

- Participants will be able to incorporate systems and human-centred design concepts to change organizations into well-being cultures and individual wellbeing techniques leading to resilience for self and others.

#### **Crisis and Pandemic Management Certificate**

- Through this course, the pharmacist will be able to address the needs of patients and the entire healthcare system related to the druggist at the time of crisis and pandemic situations. The certified person will be able to offer non-pharmacological and pharmacologic interventions to continue a secure and competent workflow at the time of crisis.

#### **Anticoagulation Certificate**

- The professional would merit with depth knowledge on cases concerning anticoagulants

#### **Pain Management Certificate**

- **Proficient in pain assessment and its pharmacological and non-pharmacological care would be attained.**

#### **Pediatrics Certificate**

- Proficiency in caring for the pediatric population is the advantage of the certification.

#### **Diabetes Management Certificate**

- The certified pharmacist will be able to evaluate various disease states related to Diabetes. He will be able to deliver quality pharmacologic and non-pharmacologic interventions considering different patient-related factors.

#### **Medication Reconciliation Certificate**

- The outcomes of this course are the expert in carrying out medication history studies and implementing such studies in an institutional setting for improving patient care.

#### **Pharmacy Revenue Cycle Management Certificate**

- Expertise in operating regulations, as well as outstanding execution of pharmacy revenue cycle, is the aim of this certificate.

#### **Pharmacokinetics Certificate**

- The course covers applications of pharmacokinetic theories to monitor, assess and alter the medication regimen for different patients.

#### **Medication Safety Certificate**

- Revamping the safe use of medicines in the respective practice setting of the pharmacists as well as other clinical staff is the agenda of the course.

#### **Emergency Medicine Certificate**

- This certification program targets pharmacists who are working with emergency medicine-related clinical activities. Also, the course focuses on evidence-based pharmacologic as well as non-pharmacologic therapy for various ailments.

#### **Nutrition Support Certificate**

- The certified person will be an expert in providing clinical care related to nutrition support for adult patients.

#### **Compounded Sterile Preparations Certificate**

- An expert in fundamental medicine compounding techniques as well as up-to-date expertise to manage and lead cleanroom preparation of sterile products in a secure and compliant manner.

#### **Sterile Product Preparation Certificate**

- The certified person will be skilful in sterile product preparation in a safe and compliant way.

**Table III: Merits of ASHP certification courses (continued)****Sterile Product Preparation Institutional Training Certificate**

- Certifications for pharmacists and pharmacy technicians, managing both people and facilities involved in compounding sterile preparations.

**Informatics Certificate**

- Through the course, the pharmacist becomes a pharmacy informaticist who can manage the medication-related information in pharmacy information systems and electronic health records.

**Pharmacogenomics Certificate**

- The certified pharmacist will be able to understand and correlate how an individual patient's gene affects his body's response to various medications used in him so that medication use can be improved.

**Teaching Certificate**

- The course covers the core modules of teaching practice, the academic component focuses on traditional didactic teaching, and the experiential component focuses on teaching in practical settings.

**Apexus Advanced 340B Operations Certificate Program**

- Created to provide learners with all of the information and insight they need to understand the challenges, stay compliant, and run their company's 340B program efficiently.

**Clinical Skills International**

- The course teaches the activities that can be led by the pharmacist in important clinical areas and the patient-centred role of pharmacists so that the certified one will acquire adequate knowledge to practice in the clinical pharmacy service related areas.

**Table IV: The prerequisite for the accomplishment of ASHP certification programmes**

Name of Certificate	CE Credit Hours	Activity fee		Number of learning module	Number of questions in exam	Passing score	Exam attempts permitted
		ASHP Member	Non member				
Well-Being and Resilience Certificate	18	USD 445	USD 545	7	70	80%	Unlimited
Crisis and Pandemic Management Certificate	25.25	USD 445	USD 545	10	100	80%	Unlimited
Anticoagulation Certificate	32	USD 445	USD 545	12	75	80%	Unlimited
Pain Management Certificate	21.5	USD 445	USD 545	9	90	80%	Unlimited
Pediatrics Certificate	27	USD 445	USD 545	9	130	80%	Unlimited
Diabetes Management Certificate	33	USD 445	USD 545	12	120	80%	Unlimited
Medication Reconciliation Certificate	15	USD 445	USD 545	7	50	80%	Unlimited
Pharmacy Revenue Cycle Management Certificate	16.5	USD 445	USD 545	9	N/A	80%	Unlimited
Pharmacokinetics Certificate	15	USD 445	USD 545	7	N/A	80%	Unlimited
Medication Safety Certificate	40	USD 445	USD 545	15	100	80%	Unlimited
Emergency Medicine Certificate	27	USD 445	USD 545	11	115	80%	Unlimited
Nutrition Support Certificate	19.25	USD 445	USD 545	11	100	80%	Unlimited
Compounded Sterile Preparations Certificate	38	USD 445	USD 545	16	125	80%	Unlimited
Sterile Product Preparation Certificate	29	USD 445	USD 545	14	90	80%	Unlimited
Sterile Product Preparation Institutional Training Certificate	29	USD 445	USD 545	14	N/A	N/A	Unlimited
Informatics Certificate	21	USD 445	USD 545	20	70	80%	Unlimited
Pharmacogenomics Certificate	20	USD 445	USD 545	8	85	80%	Unlimited
Teaching Certificate	16.5	USD 395	USD 495	3 tracks	N/A	80%	N/A
Apexus Advanced 340B Operations Certificate Program	24 video modules	N/A	N/A	N/A	N/A	N/A	2 Years
Clinical Skills International	22	USD 395	USD 495	17	41	70%	Unlimited

The information were collected from the website on 13 June 2021; N/A not available

**Antimicrobial Stewardship Certificate Programme**

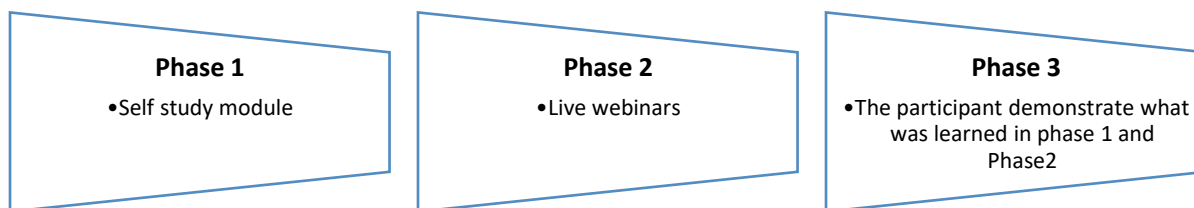
The Society of Infectious Diseases Pharmacists offers three programmes emphasising the pharmacists’ role in antibiotics utilisation (Table V). All the programme consists of three phases that can be accomplished within the home or practical atmosphere (SIDP -

Stewardship Certificate, n.d.). The first and second phase of the SIDP certificate programme comprises learning modules. Later, each participant should disseminate the information gained to their fellow professionals and aid them on how to publicise their antibiotic stewardship procedures (Figure 3).

**Table V: Phases, focus, and advantages of SIDP programs**

Name	Focuses	Phases	Cost	Discount available	Time to complete
SIDP Antimicrobial Stewardship Certificate for acute care	Essentials of clinical microbiology, pharmacology, pharmacokinetics, pharmacodynamics, and infectious disease state management, skills needed to establish, implementation of the intervention, evaluate the effectiveness of antimicrobial stewardship program	Phase 1: 28 hours or 2.8 CEUs)	USD 750	Group registration and Low-Mid Income Countries	Phase 1 and 2 within 8 months Phase 3 within 12 months of registration
SIDP Low- and Middle-Income Country (LMIC) Antimicrobial Stewardship Certificate		Phase 2: 6-9 hours or 0.6-0.9 CEUs			
SIDP Long-Term Care (LTC) Antimicrobial Stewardship Certificate Programme		Phase 3: 10 hours or 1.0 CEU)			
		Phase 1: 20.25 hours, 2.025 CEU	USD 850		
		Phase 2: (Combination of Live and Home-Study webinars) 4.25-8.75 hours, 0.425-0.875 CEU			
		Phase 3: 10 hours or 1.0 CEU			

The information was collected from the website on 15 June 2021; CEU- Credit hour explanation.



**Figure 3: The three phases in Antimicrobial Stewardship Certificate Programme**

**Board Certification in Medication Therapy Management (BCMTM)**

The non-profit and independent organisation is the first and the only authorised medication therapy management (MTM) certification host for pharmacists. They assure the public that the certified pharmacist possesses the skill and knowledge of high-quality patient care for therapy optimisation (“MTM Certification,” n.d.). BCMTM examination constitutes

200 multiple choice questions that should be completed within four hours. Pharmacotherapy (62%), medication therapy management (13%), fundamentals of pharmacogenomics (5%), patient care advocacy (13%), and documentation and billing (7%) are the five focusing areas. The initial application fee is 450 USD, and for re-test, it would become 200 USD. Individuals who pass the exam would gain the certification upon achieving the required mark that may vary slightly from each version (Figure 4).

<p><b>About examination</b></p> <ul style="list-style-type: none"> <li>* Four hour</li> <li>* 200 multiple choice questions</li> </ul>	<p><b>Partitioning in the examination</b></p> <ol style="list-style-type: none"> <li>Defining MTM and Translating MTM into practice (13%)</li> <li>Pharmacotherapy (62%)</li> <li>Fundamentals of pharmacogenomics (5%)</li> <li>Patient care advocacy (13%)</li> <li>Documentation and billing (7%)</li> </ol>	<p><b>Exam scoring pattern</b></p> <ul style="list-style-type: none"> <li>* Each version had slightly different passing score</li> </ul>	<p><b>Application fees</b></p> <ul style="list-style-type: none"> <li>* Initial certification fee - USD 450</li> <li>* Non United States resident - USD 80</li> </ul>
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**Figure 4: Salient details regarding BCMTM examination**



## Discussion

BPS, ASHP, SIDP, University of Florida Pharmacy certificate programme, and MTM programme were the five standard certificates and certification programmes discussed here. The preference was weighed onto BPS certification credentials than others (Connor & Hamilton, 2010). Alqahtani and authors underwent a knowledge attitude study on pharmacists and pharmacy academicians in a Middle East country. They observed 55.2% and 48.2% of respondents to have good knowledge and attitude concerning BPS certification (Alqahtani *et al.*, 2020). This reflects their concern towards the professional update and, on the other hand, demands for widening awareness among the larger community. Enhancement in clinical skills should be each pharmacist's motif. However, a lack of additional consideration from the employers in terms of monetary or professional growth and inadequate time led them to drop from such programmes. Moreover, pharmacists retained in community settings were not interested and claimed that employees in clinical components would only benefit through board certification (Goldenshteyn *et al.*, 2020). Studies emphasise the re-equip potential with a continuing education programme on the pharmacy discipline regardless of the work environment (Mattingly & Mattingly II, 2018). A US-based electronic survey was performed to identify the perception of pharmacy residents towards the programme. It was noted that 93% preferred to be board-certified pharmacotherapy specialists followed by oncology and psychiatry credentials. Even though developed countries do promote gaining credentials, there were more than half samples that did not want to pursue any (American College of Clinical Pharmacy Board of Regents & Maddux, 2013). Conveying and convincing the importance of being a certified pharmacist is quite essential in this current era, and the pharmacy council across the world should implement strategies to accomplish this task.

The preference of young generations to take up residency programmes and further to appear for certification programmes has been noticed nowadays. This is a positive sign for clinical pharmacy precipitated by the change in pre-requisite criteria for the official examinations (Silvia *et al.*, 2020). Pharmacists can significantly contribute to long-standing disease conditions. A survey by Silvia and authors depicted that certified psychiatric pharmacists were authorised (46.5%) to prescribe during practice under the clinician's supervision. This service was not reserved for psychiatric patients alone but also for all patients of the hospital. The entrust was established through the knowledge and skills acquired through certification programmes. Stating such achievements to the

pharmacy professionals would elevate their attitude to prepare for the credentials.

The certified pharmacist can implement advanced operation procedures and reforms in their expertise. One such example put forward by Westmoreland and authors wherein they pictured the clinical interventions suggested and implemented by certified pharmacists in the critical care department imparted profound health outcomes. The awareness concerning newer techniques and policies is certainly mandatory for installing a professional intervention; certificate and certification programmes serve the task that collectively contributions to patient betterment (Westmoreland *et al.*, 2021). Johnson and the authors researched on certified ambulatory care pharmacists that the practice preferences domain of the programme is clinically relevant and patient-focused (Johnson *et al.*, 2021). This justifies the quality of the certification programmes in healthcare, hosting pharmacists in actively involving and establishing treatment guidelines and standards for new disease conditions and re-framing the existing illness. Antibiotics being a prime concern, collaborative efforts from the American Society of Health-system pharmacist and Society of Infectious Diseases Pharmacists had brought quite suitable stewardship policies (Rybak *et al.*, 2020). Their suggestions were valuable in an era where contagious and super-spreader infections are invading. Similarly, ASHP, in association with the American college of clinical pharmacy critical care practice and research network, has recommended strategies to improve patient care (Lat *et al.*, 2020). Enhancement of the quality of medical services should be the concern of every healthcare professional and can be achieved basically through certificate and certification programmes. Each certificate and certification programme has the potency to upgrade the pharmacists to be skilful and specialise in their field. Moreover, promoting youngsters for acquiring authentic worth doing credentials is the sole responsibility of experienced and certified pharmacists.

## Conclusion

Pharmacy practice is undoubtedly reforming, and the need for further updates is essential through which ultimate patient care is accomplished. This relied upon pharmacists' attitudes towards continuing education programmes. The article serves as a guide for international pharmacists to know about certificates and certification programmes. Most sought out pharmacy credentials such as BPS, SIDP, MTM, ASHP, and University of Florida pharmacy certificate

programmes were discussed here and would assist them in gaining professional advancements.

## Disclaimer

The information provided in this article is for reference purposes only. It has been collected from the respective websites of various pharmacy professional certificates and certification programs. The details in the website are subjected to changes or updates in the future for which the authors have no influence.

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