NEAR EAST UNIVERSITY
INSTITUTE OF GRADUATE STUDIES
DEPARTMENT OF CLINICAL PHARMACY

STUDENTS' ATTİTUDE TOWARD CONTINUING PROFESSIONAL DEVELOPMENT AND PREPAREDNESS TO BECOME LİFELONG LEARNERS

POSTGRADUATE THESIS

Sarah KHAMIS

NICOSIA
December, 2020

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STATEMENT (DECLARATION)

Hereby I declare that this thesis study is my own study, I had no unethical behavior in all stages from planning of the thesis until writing thereof, I obtained all the information in this thesis in academic and ethical rules, I provided reference to all of the information and comments which could not be obtained by this thesis study and took these references into the reference list and had no behavior of breeching patent rights and copyright infringement during the study and writing of this thesis.

Sarah Khamis

7.12.2020

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Abstract

Students' Attitude toward Continuing Professional Development and Preparedness to Become Lifelong Learners

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Aim: The purpose was to develop a tool that assesses pharmacy students' competence in continuing professional development (CPD) and preparedness to become lifelong learners, to assess and compare the attitude toward CPD and its associated factors among last year pharmacy students, and their preparedness to become lifelong learners, and examining the effectiveness and utility of a longitudinal CPD training program introduced to last year master of pharmacy students.
Material and Method: 1. The tool was developed and validated using the Delphi method followed by pilot testing and exploratory factor analysis using a sample of 521 students in the last year of pharmacy programs from 7 countries. 2. A cross-sectional study carried between May and December 2019. A self-administered questionnaire delivered to last year students of seven pharmacy schools in different countries in Middle East, Asia and Africa.
2. A mixed-methods approach was used to evaluate the outcomes using student's preparedness for lifelong learner (SPLLL) self-administered questionnaire delivered pre-post program, focus group interviews for students to reflect on course experience, and instructors' evaluation of portfolios. Following the implementation of A CPD simulation course.
Findings and Results: 1. The developed questionnaire tool consisted of 5 sections and 59 questions recorded on a five-point Likert-type scale used to assess changes in students' self-evaluation of their preparedness for CPD and LLL.
2. 505 last-year students responded to fill the questionnaire. Student's assessment scores were significantly different in total and all scale domains "knowledge, skills, attitude and practice" between some of the courtiers. Cyprus has significant differences with at least one country in total and all domains. The majority of the students have learned about CPD from the university and preferred to have CPD activities as an extra curriculum and/or after graduation according to their needs. Most of the students agreed the main motivation factor to participate in CPD activities is that CPD prepare them for practice development. However, the cost of participation in some CPD activities was the most essential barriers.
3. Following the implementation of the course, students' assessment scores were significantly higher overall and for all scale domains, including "knowledge, skills, attitude and practice", compared to the baseline assessment. Additionally, compared to fifth year students who responded to the second SPLLL questionnaire, the intervention group students' assessment was significantly higher in knowledge, skills, and practice. The qualitative analysis reported high student satisfaction and achievement of the course objectives. Nineteen of the students scored high on their portfolios

Keywords: students, continuing professional development, lifelong learning, pharmacy education, competence-base education.

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- Self-Directed Lifelong Learning (SDLLL)
- Lifelong Education (LLE)
- Continuing professional development (CPD)
- Continuing Education (CE)
- Students' preparedness for lifelong learning (SPLLL)
- International Pharmaceutical Federation (FIP)
- Doctor of pharmacy (PharmD)
- United State (US)
- Accreditation Council for Pharmacy Education (ACPE)
- Roseman University College of Pharmacy (RUCOP)
- Traffic light report (TLR)
- Master of pharmacy (M.pharm)
- Continuing education (CE)
- East University (NEU)
- Self-directed learning (SDL)
- Focus group (FG)
- Curriculum Vitae (CV)
- Cumulative grade point average (CGPA)
- Pharmacist's Inventory of Learning Styles (PILS)

CHAPTER 1

Introduction

Statement of Problem

In an ever changing world, pharmacists among other healthcare professionals (HCPs) are required to continuously embrace new behaviors and adjust their practices toward emerging roles in patient care (DeSilets, 2010) (Driesen et al., 2007) . Lifelong learning (LLL) and continuing professional development (CPD) remains more than ever critical for both current and future pharmacists, in face of global health challenges, new technologies, services and therapies that are continually and rapidly introduced into their daily practice (Driesen et al., 2007). For instance, the current global COVID-19 outbreak, with its huge magnitude and severity exposed pharmacists to challenges and practices they never experienced before (Hayden & Parkin, 2020). Thus, pharmacy undergraduate programs are required to prepare graduate pharmacists with adequate competency to obtain roles in health and wellness promotion (Subramaniam et al., 2008). A pharmacist's high-level specialist knowledge and skills are maintained through an ongoing commitment to LLL (Federation, 2000).

LLL is defined as "all learning activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, and social and/or employment-related perspective" (Commission, 2016). It assures continuing competence whereby individuals consider learning and practice to be continuous, beginning with first year university studies through advanced practice (Coombes et al., 2011).

The approach or framework for achieving LLL for practitioners in the United States (US) and many other countries is through CPD (Rouse, 2004). CPD is designed to be a self-directed, practitioner-centered, and outcome-based learning process to meet the specific goals and objectives of individual pharmacists, ultimately improving patient and public health outcomes (Rouse, 2004). CPD is an ongoing cyclical process involving the following: self-appraisal, developing a personal learning plan, taking action or implementing a learning plan, and evaluation (Rouse, 2004).

LLL and CPD are among the core competencies targeted in modern pharmacy curricula and addressed in the International Pharmaceutical Federation (FIP) global pharmacy education vision and standards released at the end of 2016 (Rouse, 2004) (Janke & Tofade,

2015). Core competences should be initiated, developed and assessed within curricula to assure that graduates possess them in practice. Thus, these assure that CPD ready graduates and students are not only introduced to CPD principles but also required to practice them within their learning environments (Federation, 2002).

However, introducing these concepts into pharmacy curricula and students' practice is challenging since implementation strategies differ considerably between institutions (Janke & Tofade, 2015) ((FIP), n.d.) . Several studies have evaluated different cocurricular activities and experiences related with CPD among doctor of pharmacy (PharmD) students in the US both preceding and following the release of the Accreditation Council for Pharmacy Education (ACPE) standards of 2016. These studies showed the benefits of electronic portfolios (Briceland & Hamilton, 2010), other self-assessment and self-reflection activities (Motycka et al., 2010), live and online CPD training courses (T. S. Tofade et al., 2010) (T. Tofade et al., 2011), educating students on how to write SMART goals (T. Tofade et al., 2011), and adopting a monthly seminar or a journal club for the acquisition of CPD or LLL skills (Janke & Tofade, 2015). Earlier attempts involve Daniel L. et al. (2001) introduction of a self-directed professional development program implemented within internal medicine rotations. The aim was to prompt students to take responsibility for their own professional growth and develop LLL habits (Hobson et al., 2015).

Tofade T. et al. (2011) proposed the integration of CPD throughout curriculum (T. Tofade et al., 2011). In the proposed model, students are introduced to CPD through CPD lectures and training in the early years and are then requested to submit a CPD plan and updated portfolio routinely until graduation (T. Tofade et al., 2011). Few studies reported implementing such a longitudinal program in pharmacy schools, namely, the Roseman University College of Pharmacy (RUCOP) longitudinal CPD program for a cohort of PharmD students in the US (Unni et al., 2019) and the traffic light report (TLR) program implemented within a Bachelor's of Science (BSc) in pharmacy curricula as an elective course in an Australian university (Rosie Nash et al., 2019).

The RUCOP program involved CPD as part of the didactic curriculum of their three-year PharmD program and the experiential year. As a result, students' oral, written and interprofessional communication, leadership, and time management skills were reported

to be improved over the course (Unni et al., 2019). Other schools in the US evaluated implementation of CPD in either first (T. S. Tofade et al., 2010) or final (Hobson et al., 2015) didactic years only or within an experiential practice course (T. Tofade et al., 2011) (Rosie Nash et al., 2019).

The TLR was a two semester program designed to provide students with a form of sustainable assessment drawn on two facets of CPD, specifically, self-assessment and the national competence standards, both of which are essential to a pharmacists' LLL (Rosie Nash et al., 2019). The program was reported to provide pharmacy students with an opportunity to practice self-assessment skills, though poor student acceptance of the TLR was reported (Rosie Nash et al., 2019). An earlier study at the University of Central Lancashire in the UK also reported poor outcomes when introducing a CPD activity similar to that for pharmacists in a master of pharmacy (M.pharm) degree program (Dyke et al., 2009). Prof. Tofade T. et al.(2011) stated that the difference in the CPD implementation outcomes between the US PharmD schools and other countries was due the nature of PharmD programs and students being advanced compared to M.pharm or BSc in pharmacy programs elsewhere; thus, PharmD students may find the CPD process easier to grasp (T. Tofade et al., 2011).

The multifaceted nature of CPD as an advanced model compared to traditional approaches to continuing education (CE) necessitate that pharmacists receive training and guidance in order to develop the required competence and implement the CPD process in their practices (Andreia et al., 2014) (T. Tofade et al., 2010) .

Other countries around the world currently have a variety of systems in place for CE in pharmacy (Andreia et al., 2014), spanning from traditional CE requirements to the full implementation of a more extensive CPD approach (Andreia et al., 2014). Conversely, the situation was no or poor programs are adopted to develop LLL and CPD associated skills is also present in schools. This may further explain why implementing CPD programs is challenging outside the states (Rosie Nash et al., 2019).

In Turkey and Northern Cyprus, CPD programs are not objectively structured or a compulsory requirement for recertification in pharmacy practice. As a result, pharmacists that are preceptors for new graduates are unfamiliar with the CPD process since most of them were not exposed to it (Sancar et al., 2013) (Abdi et al., 2017).

There are over 40 pharmacy faculties in Turkey and Northern Cyprus, with local accreditations awarded by the Turkish Higher Education Counsel for professional 5 year programs (Kurulu, n.d.). Out of these, Near East University (NEU) is certified by the ACPE (Vlasses et al., 2015). To acquire this certification, the faculty of pharmacy reviewed its curriculum in order to meet the required standards. CPD and LLL were among the competencies targeted to be achieved by students enrolled in the M.pharm program that the faculty offers.

Importance of this study:

- To guide the pharmacy students while they are studying and before their practice through a CPD simulation program.
- An efficient faculty based CPD system may therefore simulate a real-world format to introduce new practices or knowledge to professionals via a short course/activity.
- Such type of courses may help student improve their personal, life and educational skills which traditional curriculums may not address enough.
- Helps students to understand the objectives of learning, as they will practice to participate in their learning themselves instead of being a recipient of education from their teachers.
- This study fills this research gap by examining the effectiveness and utility of a longitudinal CPD training program introduced to last year M.pharm students in North Cyprus. The hypothesis this research test is that a CPD simulation program is providing opportunities to practice and develop skills in self-assessment and awareness, SMART planning and monitoring, and learning documentation all desirable for LLL.

Aim of the study

- Identify and introduce methods for the assessment of preparedness of graduates to become lifelong learners.
- Assess current pharmacy students' attitude toward CPD and preparedness to become lifelong learners.

- To improve and develop pharmacy students' skills to become lifelong learners via a faculty based CPD simulation program.
- To determine whether a faculty based CPD simulation program would address the present gaps in pharmacy curriculums and assess its feasibility.
- Develop an access within curricula to introduce new practices and assure graduates competence in areas of specific and emerging needs such as care of underserved populations etc.

Project Process

A prospective mixed-method study has carried involving pharmacy students. It included three parts:

1. Develop tools to evaluate LLL competence in curriculum and students.
2. Develop and apply a faculty based CPD simulation program and assess its feasibility by pilot testing in 5th year students.
3. Comparative study to evaluate LLL competence in curriculum and students in seven different countries.

Limitations of the study

1. Small sample size of the students
2. The response rate in the 5th year students used as control in the second part of the study wasn't high enough although the current responses are considered acceptable for generating hypotheses.
3. Further on the subjective nature of self-evaluation as in the case of student's preparedness for lifelong learner (SPLLL) scale used in this study may be considered as a limitation although an objective assessment of assignments and portfolios by instructors was done.

Definition of Terms

- Lifelong learning: is defined as "all learning activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, and social and/or employment-related perspective"

- Continuing Professional Development: is an ongoing cyclical process involving the following: self-appraisal, developing a personal learning plan, taking an action or implementing a learning plan, and evaluation
- Competence is defined as follows: The ability to perform one's duties accurately, make correct judgments, and interact appropriately with patients and with colleagues.
- Professional competence is characterized by good problem-solving and decision-making abilities, a strong knowledge base, and the ability to apply knowledge and experience to diverse patient-care situations
- Continuing Education is defined as; 'material presented in an online or live classroom format

CHAPTER II
Literature Review

Theoretical Framework

Lifelong Learning

Education and learning were becoming increasingly important throughout the lifespan as people were facing the increasing plethora and range of changes bearing in upon them as the twentieth century unfolded (and now increasingly so in the twenty-first century) (Gallacher, 2013). A harbinger of the rapid changes to which such thinking needed to be subjected was the emphasis placed in 1972 on the idea of 'lifelong education (LLE)'(Gallacher, 2013). This notion was articulated and developed in the Report to UNESCO of the Committee chaired by M. Edgar Fauré entitled 'Learning To Be: The World of Education Today and Tomorrow' (Jukić, 2007). The Fauré Report provided the site for a passionate argument that the only way that people could hope to face and deal with such changes was in forms of life in which they would be constantly involved in the activities of an 'education permanente' (Faure, 1972).

'LLE' stands for a program to reconceptualise education totally according to the principle that education is a lifelong process (Wain, 2016). This means that the educators and policymakers will have to move from systems that emphasis education and training in formal institutions and settings to those of a more informal and alternative kind and to the more radical construct of accepting and undertaking the need for engagement and involvement in learning of all kinds throughout the lifespan (Wain, 2016).

The history of education shows that LLE has deep roots in the development of civilization (Savicevic, 1985). Different cultures have their own discourses on learning throughout the life course, informed by their own thinkers and traditions (Gallacher, 2013). Every society, depending on its historical, economic and cultural development, looks for the most suitable ways and forms to realize the ideal of LLE, including various forms of self-directed learning (SDL) (Gallacher, 2013). The essence of LLE is the dialectics of the development of society and of human life. LLE is not only for social, economic, and political benefits, it should contribute to the development of human potential and to the creation of human happiness (Savicevic, 1985). For that reason, it is quite justified, from

the philosophical standpoint, to speak about LLE as an individual value. If a person is a creator of his happiness then he should assume responsibility for his personal LLE and self-instruction (Savicevic, 1985). Education and self-instruction are fundamental in overcoming gaps among individuals. For that reason, one of the essentials is to realize that LLE can help to overcome human gaps. LLE helps to eradicate intellectual and emotional poverty (Savicevic, 1985).

LLE includes two basic postulates: continuity and integration. The essence of continuity is that everybody should be enabled to acquire knowledge during all periods of their lives, depending on necessities, roles and tasks that are undertaken. Education is important for human life in every stage of life. Integration, whose essence is the linkage of all levels of education, all forms of education and self-directed learning into a coherent system of education of a country, is also important (Savicevic, 1985).

There are many stages of learning throughout life. Initially, we use innate senses to set us on the road to survival and development, but very early on in our existence, our efforts become increasingly more focused in order to meet personal needs and goals (Alsop, 2013). The fact that learning is no more limited to educational institutions brought a new dimension to the issue: the skills that individuals should have (Gündüz & Selvi, 2016). It is necessary for students to be individuals who are able to access knowledge, to question the knowledge obtained, to adapt this knowledge to their beliefs and life styles, and finally to expand and to transfer their knowledge when need arises. In other words, they should be equipped with "self-development" and "LLL" skills (Gündüz & Selvi, 2016).

LLL' is a concept that has featured increasingly widely in educational policies and institutions, practices and programmes for nearly 50 years now, and whose place, power and presence has been marked especially since the mid 1990s in the attention given to it by a wide range of national and international agencies, organisations and departments (Gallacher, 2013).

LLL has been variously defined; frequently referred to in academic discourse, LLL has been attributed with the 'from cradle to grave' philosophy (UNESCO 2010) which embraces the notion of continuity in learning, starting from one's early existence till death (Leal Filho et al., 2018). However, this utopian vision seems a far cry from reality, since rather from birth, this term has often been linked with what happens after completion of

compulsory schooling till death (Leal Filho et al., 2018). Another of the more neutral definitions comes from the Commission for a Nation of Lifelong Learners (1997) defined LLL as "a continuously supportive process which stimulates and empowers individuals to acquire all the knowledge, values, skills and understanding they will need throughout their lives and to apply them with confidence, creativity, and enjoyment in all roles, circumstances, and environments (Elaldi, 2015). The European Commission also states that LLL as: all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competence, within a personal, civic, social and/or employment-related perspective ((EC), 2001). This definition embraces all learning, both formal and informal, that occurs from birth to old age and is not specific to learning for or in employment (Alsop, 2013).

Formal education is carried out in school, college and university systems and is based on an established curriculum and on approved teaching and assessment methods. Non-formal education occurs outside the formal system, but through other organized learning settings (e.g. youth groups, women's associations, zoos and museums, community organizations and adult literacy classes). Informal education results from daily life activities related to work, family or leisure, and is provided within families, religious organizations, community groups and traditional culture, as well as by news organizations, social media and various forms of entertainment (Leal Filho et al., 2018).

The Final Report (2016) of. "Shaping the Future We Want" pointed "that formal education alone is not sufficient to support a transition to more sustainable societies" (Buckler & Creech, 2014). Singh (2015) considers the interplay between formal education and training and the recognition of non-formal and informal learning as a particularly important element, and as a means of redressing past inequalities in the provision of access to formal education, training, and employment opportunities (Singh, 2015). It's clear that people are included in all these processes of education during life. Starting from informal education in the family, everybody gets a formal education then and received new knowledge via informal and non-formal educations different seminars, conferences, writing articles, self-education, etc. In many cases such education demands teacher's presence, especially for formal and non-formal educations (Leal Filho et al., 2018).

LLL is to be distinguished from LLE. Education essentially comprises activities normally planned by an education provider, whereas learning is viewed as a cognitive process internal to the learner. Learning occurs through both incidental learning experienced by the learner and by the learner engaging with planned educational experiences, thus through both informal and formal learning opportunities (Alsop, 2013). There is a wide acceptance of the view that people engaging in educational activities generally are enriched by having their view of the world and their capacity for rational choice continually expanded and transformed by having access to the increased ranges and varieties of experiences and cognitive achievements that the LLL experience offers (Gallacher, 2013).

LLL conceived of and offered through all such channels, new or traditional, often offers people the opportunity to bring up to date their knowledge and enjoyment of activities which they had either long since laid aside or always wanted to do but were previously unable to pursue; to try their hands at activities and pursuits that they had previously imagined were outside their available time or competence; or extend their intellectual horizons by seeking to understand and engage with some of the more significant cognitive advances of recent times (Gallacher, 2013).

A philosophical question stated: how to 'awaken' an individual to accept the fundamental responsibility for his personal development, as well as for the development of a society on which it depends. Such responsibility cannot be realized without acquiring knowledge as a basis for choices among alternatives during social and personal development (Savicevic, 1985). Framing and developing such responses will require the advances in know ledge, understanding, imagination and creative thinking, together with augmented self-knowledge and confidence, that can only come from increased engagement in activities that embody and confer the benefits of LLL approaches (Gallacher, 2013).

There is a complex relationship between at least three major elements or outcomes of LLL: education for a more highly skilled workforce; personal development leading to a more rewarding life; and the creation of a stronger and more inclusive society (Gallacher, 2013). LLL is said to foster the continuous improvement of knowledge and skills for personal fulfilment as well as for employment. Often, LLL entails the learner drawing on

a mixture of educational program and informal learning to develop both capability and potential for managing all aspects of life (Alsop, 2013).

LLL is good for healthcare providers as studies indicate financial, health, and social benefits (Coleman, 2017). As devoted health professionals, we should want to continue to develop ourselves, share new ideas and approaches, and together achieve our goals (Castleberry et al., 2019).

The Competencies of Lifelong Learning. In an ideal world, the process of completing a professional program would ensure that LLL competencies were a key component of what it means to be an accountable, self-directed professional (Holloway et al., 2004).

The competencies of LLL include several components: the ability to reflect on one's practice and thereby determine learning needs; the ability to efficiently and accurately search for learning resources and critically appraise them (Holloway et al., 2004) (Green, 2000); skills in applying these resources to clinical and other questions; the management of large and changing bodies of evidence; and the ability to evaluate one's competencies and practice based on external feedback (Green, 2000).

The importance of developing and maintaining these skills throughout health professionals' working lives has been stressed in both the nursing and medical literature (D. A. Davis et al., 2006) (Gopee, 2005). The Panel discussed two aspects to achieving this aim: 1) creating a sustainable educational infrastructure with strategies to assess, support, and facilitate LLL needs throughout health professionals' working lives; and 2) adapting current academic curricula and experiences to generate and assess self-directed learners with skills in knowledge acquisition, appraisal, and application. The Panel believed that the latter issue was distinct from current models of basic education, which stress knowledge acquisition and retention (Nursing, 2010).

Self-Directed Lifelong Learning. One basic tool of LLL is SDL, particularly outside structured educational settings (Leotti et al., 2010). Hojat et al. (2003) defined LLL as a set of self-directed activities (behavioral aspect), combined with information-seeking skills that are initiated with sustained motivation (predisposition) to learn and the ability to self-identify personal learning needs (cognitive aspect) (Hojat et al., 2003).

Self-direction is a complex concept with a variety of aspects and associated constructs. In practice, self-direction involves shifting the responsibility for the learning activity from an external source such as teacher to the individual learner. The learner here assumes some level of control and active engagement in the learning process (Küçüker & Selvi, 2016).

In accordance with these definitions, Küçüker defines SDL as learning preferences that require students to take responsibility for their own learning in different learning environments, to manage their own learning processes, to be equipped with affective and cognitive skills needed for realizing this learning process and to maintain continuity in learning (Küçüker & Selvi, 2016).

SDL combines a number of educational movements such as adult learning, cooperative learning, democratic learning, and critical pedagogy. The discussions on SDL were initiated by Dewey and Lindeman in 1900s (Gündüz & Selvi, 2016). The first detailed studies in the field were carried out by Knowles and Tough (Saeednia, 2011) (Knowles, 1975). Knowles defined SDL on the basis of the behaviors that are supposed to take place during the process. In his definition, SDL is a process that includes decision making with or without the help of others, determination of the learning needs, clear and accurate expression of learning outcomes, choice and application of appropriate learning strategies and evaluation of learning outcomes (Knowles, 1975).

According to Long (1987), who conducted and supervised a considerable number of major studies in the field, SDL refers to mental processes used to determine learning objectives and behavioral activities involving the search and definition of knowledge required to achieve these objectives (Hoban & Hoban, 2004). Similarly, Bolhuis and Voeten (2001) suggest that SDL is about the following issues: students' attempts to organize their learning processes in a simultaneous and complementary way; focusing on structuring the knowledge obtained about the topic as well as the affective dimensions of learning; and perception of the outcomes as a social phenomenon (Zsiga & Webster, 2007). According to Annuar and Shaari, SDL is a process during which individuals evaluate their learning needs, formulate goals, choose and implement proper strategies and analyze learning outcomes. It also helps students to improve themselves and society (Gündüz & Selvi, 2016). Fisher, King, and Tague also define SDL as students' taking initiatives and responsibilities for their own learning processes (Fisher et al., 2001). English and

Kitsantas also emphasized the role of students' responsibility in learning in SDL and defined SDL as students' taking part in a learning process that they themselves specify rather than the ones defined by instructors (English & Kitsantas, 2013). Tyler, Trumpower, Atas and Purse stated that SDL is often characterized with a significant level of individual choice and control and the learner is considered an autonomous decision-maker in learning activities (English & Kitsantas, 2013).

When the definitions suggested above are examined, it can be seen that a group of experts define SDL as personality traits affecting learning while others suggest that it is a learning process where learners consciously try to achieve their own learning goals. Some of them define it as a product, goal or outcome in terms of a learner's orientation. They also specifically focus on effective factors leading to the realization of SDL (Gündüz & Selvi, 2016). Major affective skills affecting individuals' SDL include the following: valuing learning; being goal-oriented; being curious; having will and basic freedoms; taking responsibility for learning; risk taking; having self-confidence; and insisting on learning (Alcı & Altun, 2007).

SDL affective preparation skills, which include learners' attitudes towards learning and their behaviors reflecting their personality characteristics, refer to the behaviors of learners while managing and evaluating their own learning. Specifically, these affective skills are "taking responsibility for learning", "being willing and open to learning" and "valuing learning". SDL cognitive preparation skills refer to learners' planning and preparations for SDL prior to the implementation and evaluation of learning process. These skills include "determining learning needs and objectives", "managing learning resources" and "communicating with others" (Gündüz & Selvi, 2016).

Self-direction enhances motivation to learn during problem solving (Leotti et al., 2010)and increases the efficiency of learning through allowing learners to focus attention and effort on specific goals for knowledge that are currently needed, as well as providing support for control of the timing of learning, spacing of learning, and the order of information (Voss et al., 2011). Exploration and curiosity, associated with self-direction, have been found beneficial to learning (Wittmann et al., 2008).

The goal of self-directed, LLL in the graduate medical course Self-directed, LLL is defined in the Graduate Medical Course as the development of graduates who: are

conscious of the need and accept responsibility for evaluation of practice in the light of changing understanding; are able to identify deficiencies in their own knowledge, skills and attitudes; are motivated to generate a learning programme to address deficiencies, including finding and using the best evidence; have the skills to identify, access and use resources wisely and efficiently; are able to evaluate learning efforts, including resources used, and the effects on practice, and are committed to repeating the cycle with each patient and clinical situation (Holloway et al., 2004).

Continuing Professional Development

Practitioners of various professions have always strived to maintain or enhance their competences and skills in order to provide the best quality of service as demanded of them by their clients (Aziz et al., 2013). Competence is defined as follows: The ability to perform one's duties accurately, make correct judgments, and interact appropriately with patients and with colleagues. Professional competence is characterized by good problem-solving and decision-making abilities, a strong knowledge base, and the ability to apply knowledge and experience to diverse patient-care situations (Pharmacy, 2001).

To fulfil this need, they have to keep on learning throughout their working life. In order to maintain the practitioner's competence as well as ensuring the delivery of quality care, professional associations and authorities have begun to develop a formal system of LLL (Aziz et al., 2013). CPD is a framework for, or approach to, LLL, it is not a replacement for CE, as quality-assured CE is an essential component of CPD (Rouse, 2004). One such approach is the introduction of CPD as it has been acknowledged that the previous concept of CE has became inadequate to face the challenge of having to professionally update and upgrade oneself (Aziz et al., 2013). CPD is a concept which has evolved from the need to find a better platform for professionals to face the challenge of keeping themselves up-to-date with new knowledge, discoveries and skills in order to perform better in their professions (Driesen et al., 2007) (Rouse, 2004).

There are a variety of different definitions used for CPD across different jurisdictions but must of these definitions share a set of common characteristics (Rouse, 2004). CPD is generally a self-directed process that enables individuals to develop and enhance a broad range of knowledge, skills and attitudes relevant to their existing and future roles (D.

Davis et al., 1999). The Chartered Institute of Personnel and Development put forth an early definition of CPD in October 19972: “CPD is systematic, ongoing, SDL. It is an approach or process which should be a normal part of how you plan and manage your whole working life.”(Caulkin & through People, 2001). CPD can also be defined as the conscious updating of professional knowledge and the improvement of professional competence throughout a person's working life. It is the key to optimizing a person's career opportunities, both today and for the future (Khan, 2010). CPD can be considered as a process in which individual practitioners identify their own learning needs, makes plan to meet those objectives, executes those plans, and finally evaluates the effectiveness of the plan in relation to their practices (Driesen et al., 2007) (Rouse, 2004).

Continuing Education and Continuing Professional Development in Pharmacy. There are important distinctions between CE and CPD, and indeed with LLL. It is important to differentiate CPD and CE, CPD is a supplement to traditional CE, providing a more reflective and directed approach to professional growth (Rouse, 2004). CPD is focused on the individual practitioner; CE is structured to address the learning needs of the majority of practitioners.

Traditional CE delivery has been described by Konstantin ides as ‘material presented in an online or live classroom format. The learning consists of listening and reading, then applying the information to an assessment, often in the form of a multiple-choice exam (Konstantinides, 2010).’ The major advantage of CPD over CE is that for CPD, learning can be linked to the workplace as it is intended to be more experiential and informal. Many of the daily activities such as analysing critical incidents at work and structured reading can constitute as CPD if recorded correctly (Austin et al., 2005).

In the pharmacy profession, CE and CPD have its own definition. The ACPE (2003) defined CE is as “a structured process of education designed or intended to support the continuous development of pharmacists to maintain and enhance their professional competence. CE should promote problem-solving and critical thinking and be applicable to the practice of pharmacy.” Meanwhile, CPD has been defined as “responsibility of individual pharmacists for systematic maintenance, development and broadening of knowledge, skills and attitudes to ensure continuing competence as a professional throughout their careers” (Federation, 2002). The American Society of Health- System

Pharmacists (ASHP) statement on CE: Next to integrity, competence is the first and most fundamental moral responsibility of all health professions. Each of our professions must insist that competence will be reinforced through the years of practice. After the degree is conferred, CE is society's only real guarantee of the optimal quality of health care (Pharmacists, 1990).

Thus, CPD encourages pharmacists to find their own learning needs and to find activities to fulfil those needs and to apply those skills in their workplace. On the other hand, in CE, learning are intended to meet the needs of a group of pharmacists as CE providers will not be able to identify and respond to individual needs (Rouse, 2004). CE providers determined the content of CE activities such as workshops, and courses, which will not fully meet the pharmacists' individual needs. CE can lead pharmacists to perceive that they need to have 'certificated' hours to meet their learning needs (Attewell et al., 2005). Thus, CE encourages pharmacists to collect points, certificates and attendances of courses or conferences. With the evolution from CE to CPD, CE has become one of the CPD component in which pharmacists maintain their competency (Mottram et al., 2002). It has been suggested that, the majority of pharmacists preferred traditional CE since it can provide specific structure and outcomes of learning like the fixed hour of CE whereas CPD concept is less structured without a clear process to assist individual in doing self-assessing (Austin et al., 2005).

Continuing Professional Development in Pharmacy. Maintaining competence throughout a career during which new and challenging professional responsibilities will be encountered is a fundamental ethical requirement for all health professionals (Federation, 2002). As new technologies and therapies are continually introduced into practice, demonstration of competency is essential to the professional growth of healthcare professionals. Health care professionals are required to engage in CE.

CPD is a requirement for healthcare practitioners in order to sustain the essential levels of knowledge and skills needed in their career. This is mainly to ensure having the desirable high standards of competence in delivering and improving patient care (Haywood et al., 2013). The adapted concept of CPD embraces a LLL process where knowledge is continuously advancing. According to Watkins et al. (1992) knowledge and skills that HCPs possess in the beginning of their career has as short shelf-life (Wilkinson

et al., 2002). Williams (1996) claimed that the half-life of knowledge is approximately 2½ years. Whereas, Rice and Keck (1998) suggested that knowledge decreases in worth by at least 10% each year. Furthermore, Gilles and Pettengill (1993) emphasized that the advancement in science and technology reflects on health care field, therefore knowledge gained in an undergraduate degree may become outdated within a span of 10 years (Levett-Jones, 2005).

Consequently, having an effective CPD program provides HCPs with the framework to develop their skills and gain knowledge within their scope of practice throughout their career life. It also, prepares HCPs to meet the growing demand and maintain a high-quality level in patient care services (Sturrock & Lennie, 2009).

A successful CPD program would have to be efficient, flexible and tailored to the group of audience that it is targeting. Furthermore, training methods that make use of the new technology usually receive acceptance from the majority of healthcare professionals. These training methods vary from SDL activities that use online teaching materials to the more complex and interactive methods e.g. discussion boards where certain groups engage in dialog in a particular topic (Milanese et al., 2014).

Variations of the basic CPD model, using different terms to describe the stages, have been adopted or discussed in pharmacy, but the differences are not significant. Implementation strategies and the professional and regulatory framework within which the CPD model is adopted do, however, differ considerably, and some examples are described later.

In a changing, increasingly complex profession, and with rapid medical and technological advances, the need for LLL for pharmacists is irrefutable. While appropriate, competency-based education can prepare a pharmacist to enter practice, no professional program can provide or develop the knowledge, skills, attitudes, and abilities that a pharmacist will ever need. CPD is an ongoing cyclical process of continuous quality improvement which allows pharmacists to learn and develop to meet their own personal and professional needs, the needs of the health service and needs of patients. The latter can be defined as structured learning experiences and activities in which pharmacists can engage after they have completed their academic education so as to improve knowledge, skills and competencies (Rouse, 2004).

Aims and Objectives of Continuing Professional Development. The purpose of CPD is to ensure that pharmacists maintain their knowledge, skills, and competencies to practice throughout their careers in their specific area of practice; improve personal performance; and enhance their career progression. It emphasizes the importance of practice-based learning and, in the United Kingdom's model, of identifying and achieving organizational goals and objectives (Federation, 2002).

Regulatory bodies are taking the necessary action to achieve this goal CPD is currently an issue that is under the spotlight and many national bodies are seeking to reform and improve their approach to CPD in order to ensure that the professionals operating in those sectors are engaged in a process of ongoing maintenance and growth of professional excellence through participation in accredited LLL activities. There is currently a global shift in place as many professional bodies are moving from a fairly limited CE based approach to a much more comprehensive CPD approach (Knowles, 1975).

The ultimate goal of any CPD system for health professionals is improved patient safety. Patients have a right to be confident that professionals providing health care remain competent throughout their working lives. They will expect governments, accreditation agencies and other pharmacy bodies with a legitimate interest, to seek assurances that Pharmacists must keep up to date with changes in pharmacy practice, the law relating to pharmacy and the knowledge and technology applicable to pharmacy, and must maintain competence and effectiveness as a practitioner (Federation, 2000). CPD supports pharmacists in providing patient care, promoting health improvement, wellness, and disease prevention, innovating and developing the role of the pharmacist, managing and using resources of the health care system (Goode et al., 2019).

Benefits of Continuing Professional Development. On the personal aspect, CPD is an investment that we make in our self for accelerating our carrier. It helps doctors to improve their professional effectiveness and career opportunities. It will boost our confidence and strengthen our professional credibility to prepare us for greater responsibilities and we can see our progression by tracking our learning. It will help us to be more creative in tackling new challenges and we will be able to cope positively with change by constantly updating our knowledge and skill. With CPD we will be able to identify our gap in knowledge and experience. CPD makes our working life more

interesting and can significantly increase our job satisfaction and prevent 'burn out' (Caulkin & through People, 2001).

As organizational benefits, the organizations shift the responsibility for personal development back to the individual, the ability and insight to manage our professional growth is seen as a key strength. CPD will maximize staff potential by linking learning to actions and theory to practice. This leads to better staff morale and a motivated workforce helps give a positive image or brand to organizations. This is a good tool to help employees focus their achievements throughout the year (Caulkin & through People, 2001).

In term of the Community benefit, CPD contributes to improved patient healthcare and to a healthier society and the ultimate aim is to deliver a high-quality care to the community (Caulkin & through People, 2001).

Continuing Professional Development Model. CPD should include a wide variety of methods for attaining new knowledge, skills, attitudes, and values. The CPD model for LLL and professional development of practitioners is sound theoretically and was developed using well-tested principles of learning and continuous quality improvement (Krevesky et al., 2012). In the 1970s and 1980s, Kolb and Smith described how people learn and handle day-to-day situations in their lives. Based on the work of Kolb, a four-stage cycle of experiential learning has been described: (1) have a new experience, (2) reflect on that experience, (3) draw some conclusions, and (4) act differently as a result of the experience (Janke, 2003).

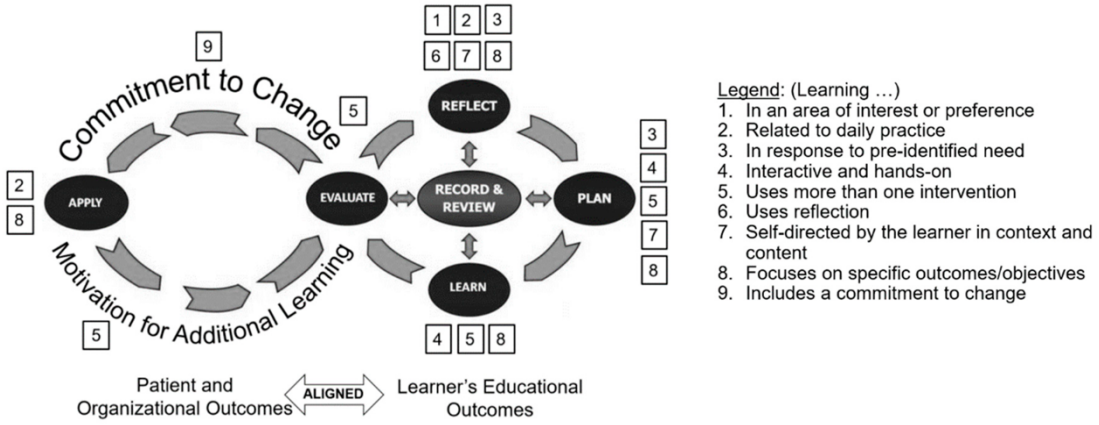
All pharmacy professionals will continue to learn and develop throughout their professional lives to maintain and enhance their competence. A system for identifying individual learning requirements and for recording learning events, based on the CPD cycle of reflection, planning, action and evaluation was rolled out to pharmacy professionals from 2002 onwards (Donyai et al., 2011).

Currently, the CPD approach has been described as a 4-stage cycle, consisting of Reflect, Plan, Learn (previously Act), and Evaluate. Record and Review is an integral part of all 4 stages. Some have described CPD as a 5-phase cycle with Record as the separate, fifth stage.6 ACPE adopted 6- stage cycle, consisting an assessment of needs and goals (reflect), generated from a personal development plan with outcomes-based objectives

(plan), and evaluated for achievement of objectives and personal and professional impact (evaluate). Key to the CPD approach is linking learning to practice (apply).

Figure 1

Continuing Professional Development Cycle



Reflect. The assessment of learning need should be the first thing and the needs can be addressed either from self-assessment of performance, performance reviewed by professionals/peer or from professional/employer and or regulatory binding as a requisite to future promotion (Fox & Bennett, 1998).

Health care practitioners' personal reflection on their professional practice is an essential part of learning in any healthcare field. They can reflect on their practice in 1 of 2 ways: scheduled or unscheduled. Scheduled reflection ("on practice") is done periodically (eg, annually or biannually), whereas unscheduled reflection ("in practice") is completed in response to day-to-day experiences in practice (Wheeler & Chisholm-Burns, 2018).

Reflection means thinking about things. It includes thinking about your practice as a pharmacy professional, deciding if you want to change the way you do things or develop your career. It also includes identifying if you want to introduce a new element to your practice such as a pharmacy service to a residential home or diagnostic monitoring. Reflection means thinking about other things too, such as conversations with colleagues or thinking about something you have read. Both of these can trigger ideas that lead to the recognition that you need to learn something else (Wheeler & Chisholm-Burns, 2018).

The reflect stage requires pharmacists to reflect on their personal and professional lives and self-assess their learning needs and goals. Areas requiring professional development should be identified. It is important to pinpoint what specific knowledge or skills are needed. Peer assessment can offer valuable insights to assist a pharmacist in identifying true learning needs (Education, 2015).

The process should involve four stages: firstly, the profession estimates where he or she ought to be in terms of knowledge, skill, and performance related to the change. Secondly, he or she also makes an estimate of what he or she presently knows or is able to do in terms of the image of change. Estimation of the discrepancy between what he or she ought to know or do and what he or she currently knows or does is the third stage and finally the he/she should experience a level of anxiety because what is known or done does not match what ought to be (Fox & Bennett, 1998).

There are a variety of methods to help you reflect on and identify your learning needs. These include; critical incident analysis by learning from a situation that did not go according to plan. What went wrong and why, and what could you do differently in future? In order to perform differently you may need to develop a new skill or acquire knowledge. Secondly the feedback from others; discussing your practice and learning needs with colleagues can be useful as our perception of ourselves often differs from that of others. Their input may take the form of appraisal, peer review or an informal discussion. The third method is reading and other activities; reading publications and participating in workshops and study groups will also introduce fresh ideas and help you to reflect on your learning needs. Finally, is through the personal SWOT analysis; undertaking a personal SWOT analysis can help you to identify personal Strengths, Weaknesses, Opportunities and Threats (Khan, 2010).

Personal SWOT-Analysis. Since the 1960s SWOT-analysis (strength, weakness, opportunity, threate) has been widely used in strategic planning. With the SWOT-model, analysts had a strategic planning tool for their intellectual work. SWOT-analysis enabled analysts to see the firm's position and its environment of competition through a logical and coherent framework of interactions of strengths, weaknesses, opportunities and threats, instead of a fragmented and inconsistent presentation by (Tokarev, 2002).

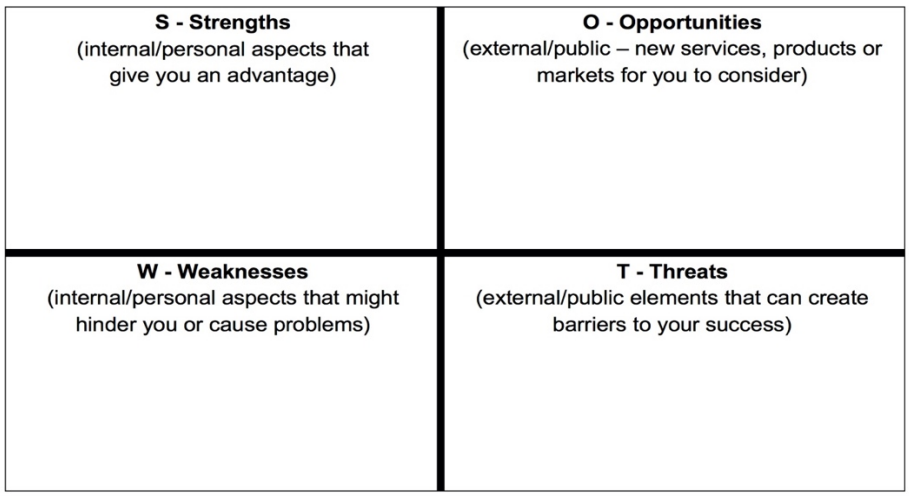
Personal SWOT-analysis is carried out in several stages; stage-1 is the formation of the set of personal goals by formulating specific long-term and short-term personal goals and to construct a tree. Second stage 2 is conducting the personal SWOT-analysis by assessing the weaknesses and the strengths of the person in question and also opportunities and threats that the person is facing on his way to achieving his goals (Tokarev, 2002).

Application of SWOT-analysis for an individual makes it possible to evaluate internal and external resources (strengths) of the person for achieving his goals, as well as opportunities and existing threats for the person. With the results of the analysis, a matrix of measures/actions is constructed (Tokarev, 2002). These measures aim at the use of the strengths of the individual, improving weaknesses, the use of external opportunities and prevention of threats, and, most importantly, the formulation of a personal development vision and the creation of a strategic plan for the realization of personal goals.

Depending on the goals, internal factors of the individual considered in the analysis are knowledge, skills, competencies, work experience, finances, available resources of the company, brand power (reputation, loyalty), individual qualifications, technological opportunities, etc. Depending on the goals, external factors for the individual that are examined in the analysis are legal, social, technological and economic aspects of the environment, characteristics of competitors, technological resources of competitors, etc.

Figure 2

Personal SWOT Analysis



Plan. The plan stage involves formulating a personal development plan (PDP) to accomplish identified learning needs. Planning is done after learning needs are identified during the reflection stage. The need means that the CPD activities must be a mixture of learning which is relevant to the current and or future practice and will benefit service user15. There is one interesting thing that what we need to learn and what we want to learn varies. We must want to learn really what we need to upgrade and improve our competence for high quality patient care (Starke & Wade, 2005).

Planning process should include all of the activities that will address identified learning and development needs and goals. The learning goals should be SMART (specific, measurable, achievable, relevant, and time based) objective plan. A realistic plan can be developed to meet both short-term and long-term learning needs and goals. Typically, this plan fits the individual's learning style and includes a set timeline and priorities (Khan, 2010). Learning needs should be prioritized based on importance and urgency in order to guide development of a plan specifying both short-term and long-term goals.

Planning is important to CPD because it enables you to identify and set priorities according to their urgency and importance. Some things need to be done immediately while others can wait. Similarly, some of the things you want to learn are more important than others. Once you have identified something you want to learn we ask you to consider its importance to patients and the public, your colleagues and to the objectives of your organisation. Then you can record these details in the planning section of your CPD entry (Janke, 2003).

Pharmacists who have no prior experience with such planning will probably need assistance with this, which will likely create service opportunities for professional membership organizations and CE providers. The outcomes should be linked to one or more specific professional competencies (Education, 2015). When possible, pharmacists should also address patient health care needs.

Figure 3

Need-Based Education

SMART Objective Plan. One-way successful professionals can increase their productivity and also increase job satisfaction is by using SMART goals. By establishing long- and short-term SMART goals, professionals can maintain their focus on projects that are important to them and, more importantly, take on additional tasks that increase their job satisfaction. The SMART objective plan is defined as an objective is a statement which describes what an individual, team or organisation is hoping to achieve (T. Tofade et al., 2012). There are a number of different versions of the acronym with different terms associated with some of the letters as indicated below.

The SMART acronym is a tool designed to help organisations and individuals set objectives in an effective and productive manner. Both Peter Drucker (1955) and G.T.Doran (1991) have been credited with developing the model, although it is difficult to be certain whether either of these two were really the first people to use the term 'SMART' with reference to objectives (Chartered management intitute, 2014). The concept of SMART objectives is commonly used by managers to set individual objectives within appraisal and performance management systems. Like many models, SMART has been criticised and a number of variations have been proposed. These include SMARTER which adds Evaluated and Reviewed (or Rewarded) to the traditional framework. SMART i.e. specific, measurable, achievable, realistic and time-bound.

S – Specific; when setting a goal, be specific about what you want to accomplish. Think about this as the mission statement for your goal. This isn't a detailed list of how you're going to meet a goal, but it should include an answer to the popular 'w' questions.

M – Measurable; what metrics are you going to use to determine if you meet the goal? This makes a goal more tangible because it provides a way to measure progress. If it's a project that's going to take a few months to complete, then set some milestones by considering specific tasks to accomplish. Milestones are a series of steps along the way that when added up will result in the completion of your main goal.

A – Achievable; this focuses on how important a goal is to you and what you can do to make it attainable and may require developing new skills and changing attitudes. The goal is meant to inspire motivation, not discouragement.

R – Relevant; relevance refers focusing on something that makes sense with the broader goals.

T - Time-Bound; anyone can set goals, but if it lacks realistic timing, chances are you're not going to succeed. Providing a target date for deliverables is imperative. Ask specific questions about the goal deadline and what can be accomplished within that time period. If the goal will take three months to complete, it's useful to define what should be achieved half-way through the process. Providing time constraints also creates a sense of urgency.

Figure 4

SMART Obiective Plan Record

Plan: Personal Learning Plan			
Goal SMART Learning Objective	Resources Planned Activities	Time Frame	Completed?

Learn and Apply. In the learn stage, the PDP is brought into practice. The Learn or Act phase entails implementing the plan. CE comes into play at this stage of CPD. Learning can be achieved by outcome-driven activities. However, the activities, which typically have a predefined outcome, can be structured (eg, CE activities, short courses, certificate programs, and live and online programs) or unstructured (eg, discussions with colleagues or mentors, expert counsel, and other professional activities) (Accreditation Council for Pharmacy Education, n.d.).

The pharmacist puts the personal development plan into action to meet identified learning objectives utilizing an appropriate range of learning activities and methods. The activities should fit with the pharmacist's preferred learning style. In the CPD model, the pharmacist is not limited to ACPE-accredited educational activities but may find relevant learning activities from other sources, such as academic programs, or specialized training courses. The activities will help the pharmacist to use and augment his or her knowledge and skills base. Then learned knowledge, skills, attitudes, and values are then applied into practice (Wheeler & Chisholm-Burns, 2018).

Pharmacists' Inventory of Learning Styles. An important stream of inquiry in learning theory is the notion of learning styles. Dunn et al. defined the term 'learning style' as different and unique ways used by individuals as they prepare to learn and recall information. Critical to their construct is the notion that individual psychological factors play a predominant role in governing an individual's learning (Dunn et al., 1990).

Understanding one's preferences provides a basis for self-reflection and personal and/or professional development. Educational theory suggests that clinical experience and success at examinations bears a relationship to learning styles. School performance has been shown to correlate poorly with students' performance in the university (Peers & Johnston, 1994), possibly because university education requires more deep learning and analytical thinking compared to simple factual recall required for advanced level or equivalent school examinations.

Numerous terms have been devised to describe the plethora of strategies and approaches used by individuals: learning by seeing, visual learning, auditory learning and learning by doing are examples of terms that attempt to encapsulate learning styles (Austin, 2004a). While each term suggests a certain preference or reliance on a specific strategy, few would suggest that each term is all encompassing. For example, those who may prefer learning by doing, are also capable of learning by reading, and will balance different approaches depending upon a variety of environmental and personal contingencies.

Initially, Kolb described these learning styles as a continuum, one that evolves over time until a stage where people come to rely upon (or "prefer") one style above all others. Kolb did not conceive of these learning styles as mutually exclusive or isolated. In different

circumstances, people may demonstrate different learning styles; however, most people tend towards a stable, predictable approach to learning in new situations (Kolb, 1999).

Kolb's (1981; 1984; 1999) theory of learning styles posits two major axes (or dimensions) upon which learning preferences are constructed. One axis is built upon anchors related to performance ("Doing" vs. "Reflecting") and relates to the ways in which individuals prefer to receive or take in information. The second axis is built upon anchors related to ways in which individuals prefer to process information once it has been received: "Experiencing" vs. "Thinking"). The intersection of these two axes produces four quadrants, each corresponding to a distinct learning preference (Kolb, 1999).

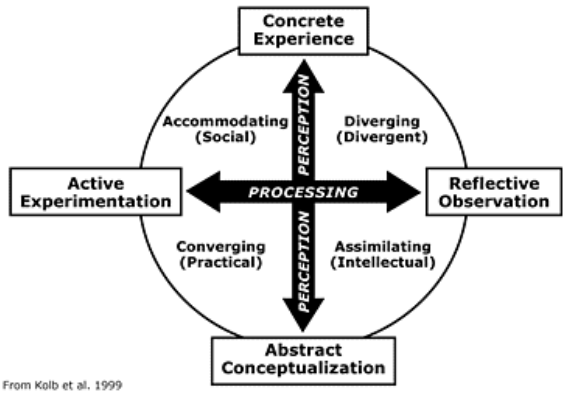
- Reflective Observation: watching others, or developing observations based on one's own experience, in a learning situation.
- Abstract Conceptualization: creating theories to explain and understand observations.
- Active Experimentation: using (or applying) theories to solve problems and make decisions.

According to Kolb's theory, individuals tend to express preferences along these domains. For example, individuals who have preferences for both concrete experience and reflective observation will demonstrate learning attributes that differ from those who prefer active experimentation and abstract conceptualization.

Kolb's theory distills these notions into four major learning style types accommodator, assimilator, converger and diverger (figure 5)

Figure 5

Experiential Learning Theory



The lack of understanding on the learning style preferences of pharmacy students can lead to a mismatch of learning styles and teaching methods by instructors which can further cause stress and frustration to both parties (Teevan et al., 2011). As a result, the learning process may be deemed an unproductive experience by both students and instructors.

Pharmacists' Inventory of Learning Style (PILS) tool, which was specifically developed and validated for pharmacy education by Austin (Austin, 2004a). Adapted primarily from aspects of the Kolb LSI, the PILS was the first pharmacy-specific instrument to assess learning styles. The modified version of PILS includes learning-style descriptors with definitions that essentially overlap those of the Kolb LSI. The use of the well-validated tool in the pharmacy education setting would be more appropriate in measuring the learning style preferences as well as students' attitudes and feelings towards the courses they have taken.

PILS divided the learning styles of pharmacists into four groups: *accommodator, assimilator, converger* and *diverger* (Austin, 2004b).

- Diverging: Combining elements of concrete experience and reflective observation, Divergers tend to view situations from multiple perspectives. Their bias is towards observation, rather than action. They tend to enjoy brainstorming and idea generation, and value harmony, listening with an open mind and giving and receiving personal feedback.
- Assimilating: Combining elements of reflective observation and abstract conceptualization, Assimilators tend to focus less on individual needs and more on ideas, concepts and logical arguments. Assimilators tend to enjoy analytical work and having time to think things through rather than be put on the spot.
- Converging: Combining elements of abstract conceptualization and active experimentation, Convergers demonstrate a preference for practical uses for ideas. They work well in time-pressured situations where problems must be solved and decisions must be made. Convergers tend to prefer to lead, rather than follow, and may prefer dealing with technical tasks and problems rather than social or interpersonal issues.
- Accommodating: Combining the elements of active experimentation and concrete experience, Accommodators learn best from hands on experience. They make decisions quickly and decisively, value time efficiency and completing tasks expediently.

Figure 6

Kolb learning Style

PILS (Kolb's[b]) Learning Style	Characteristics	Preferred Teaching Style
Enactors (Accommodator)	Opportunistic, intuitive, goal-oriented, active, down-to-earth	Wants to know reason for learning, wants to be given resources for learning
Producers (Assimilator)	Organized, attention to details, rule-oriented, patient, fair-minded	Lectures (by experts), individual homework, limited group work
Directors (Converger)	Practical, leaders, action-oriented, purposeful, networkers	Group work (with purpose), competitions, practice by doing
Creators (Diverger)	Creative, peace-makers, people-oriented, open-minded, free-spirited	Group work (no time pressure), unstructured activities, creative games

[a] Adapted with permission from Zubin Austin, PhD, and the *American Journal of Pharmaceutical Education*.[23]
[b] The Pharmacists' Inventory of Learning Styles, developed by Austin, was based on Kolb's Learning Style Inventory.[18]

Evaluate. This is the most important stage of the cycle as this is where you think about (reflect on) what you have learnt. The Evaluate phase consists of reflecting on each of the aforementioned stages of the CPD cycle. Evaluation should occur at least annually to ensure not only appropriateness and effectiveness of the plan and its implementation, but also the outcomes and impact of the learning (Fjortoft & Schwartz, 2003).

There are two stages to evaluation. Firstly, you need to think about the success of your learning activities. Have you learnt all you wanted to, or is there something else that you still need to learn? This is important to understand because you may need to undertake additional learning activities to achieve what you set out to learn.

Secondly, you need to understand if what you have learnt has benefited or will benefit your practice as a pharmacy professional. This may be the case even if you did not complete the learning fully. Identifying benefits is not always obvious. If you are able to introduce a new service successfully, the benefits will be clear. If, as a result of some learning, you are more confident in your ability to respond to a particular query or have some new knowledge that you can use in your practice that is a beneficial outcome.

If learning needs were not fully met, it may be possible to identify further development needs at this stage. Activities that resulted in practice changes or beneficial patient outcomes are analyzed. Personal evaluation leads to reflection, which continues the ongoing cyclical process of CPD. Evaluation does not necessarily have to be done only by the practitioner; it can be supplemented by the practitioner's peers, supervisor or manager (Salinas, 2015).

Documentation (Portfolio). Although variations of the model have been adopted or discussed, CPD essentially involves a cycle in which individual practitioners reflect on their practice and assess their knowledge and skills, identify learning needs, create a personal learning plan, implement the plan, and evaluate the effectiveness of the educational interventions and the plan in relation to their practice.

Alongside the sequential stages of the CPD cycle, documentation continues to be an integral part. CPD activities should be documented for evidence of competence, Documentation serves as a tool for a professional to have all of their reflection, planning, learning, and evaluation readily available to use when needed, either to provide evidence of learning, professional development, practice changes, organizational improvement, or patient outcomes, or to support and guide future learning (hence, Record and Review). Documentation is frequently in a portfolio format, either electronic or paper-based.

Documentation of each stage in the CPD cycle in a personal portfolio can support reflection and evaluation and provide evidence of the work involved to others (e.g. employers, professors, regulatory agencies). The portfolio should be simple to use, readily accessible, and developed over time into a comprehensive record of learning experiences which acts as an ongoing tool for review and self-evaluation.

According to Sutherland an e-Portfolios is defined as "a purposeful aggregation of digital items ideas, evidence, reflections, feedback, etc., which 'presents' a selected audience with evidence of a person's learning and/or ability" (5). It is basically a tool that facilitates documentation of CPD credit hours instead of using the paper-based logs. It also permits HCPs to be involved in the process of planning their own CPD activities electronically and set goals to be achieved through the year (6). These electronic documents benefit both HCPs and organizations that are looking into their employees' involvement in educational activities and track those who needs more training (2). In a larger scale, it can serve both as an assessment tool and a record of professional learning activities for healthcare practitioners.

Continuing Professional Development (CPD) Activities. A multitude of educational activities exist in various formats and venues which may benefit pharmacists and pharmacy technicians in their LLL. Types of activities undertaken should be identified and prioritized through the planning process to address educational needs and gaps in

practice such as; Academic/Professional Study, both structured education and unstructured autonomous learning activities may enhance current competencies or instill new knowledge or skills to address an identified need (Education, 2015).

Scholarly Activities; by generating and disseminating knowledge through scholarly activities may enhance professional practice and support achievement of career goals.

Teaching and Precepting, by active involvement in the education and training of others may support advancing one's expertise, the achievement of one's career goals, and enhancement of professional development (Education, 2015).

Workplace Activities; by experiences in one's workplace can present opportunities for learning and professional development (Education, 2015).

When selecting CPD activities, consideration should be given to incorporating a wide variety of learning formats and methods that can meet one's professional development needs and goals. Resources (e.g. expertise/access, financial, technology, etc.) should also be considered when selecting an activity to support professional development. The breadth of activities selected should meet identified learning objectives and collectively address the competency areas relevant to one's practice.

Continuing Professional Development Barriers. Participation in CPD programmes varies widely from organisation to organisation. CPD, though recognised as important, is still not always clearly defined and the policies and procedures of organisations often reflect that fact. This lack of definition is a barrier to its wider acceptance and implementation (Friedman and Phillips, 2001). Some of the most common barriers twards CPD recorded by studens and professionals are; Accessibility (location/distance) of group learning activities Job constraints, Lack of time, Cost of participation, Lack of relevant learning opportunities, Uninteresting subjects or topics, Lack of quality learning activities, Lack of learning opportunities to match the learning style Family constraints (e.g. Spouse, children), Professional burnout, Subjects/topics too specialised, and Low personal priority of learning in relation to other activities.

Funding and lack of time are the most common restrictions or barriers that affect CPD activities. Planning and arranging CPD activities would be challenging financially if the funding of those events were not planned in advance and included in the annual budget of the healthcare organization (Haywood et al., 2013). Similarly, unsatisfied employees and

their complaints about the lack of time to attend learning activities offered by their own healthcare organization falls also under the same cause of improper planning. This situation could be due to work overload that pressures healthcare practitioners and gives them a minimum time to attend CPD activities within weekdays (Guled, 2017). Moreover, most of the CPD activities are carried out on weekends, which is the time that most healthcare practitioners spend it on personal matters or with their families (Katsikitis et al., 2013). Having prolonged sessions of learning activities backed on weekends could be one of the reasons that prevents healthcare staff from attending those activities (Katsikitis et al., 2013). In addition, there are some other reasons that might affect HCPs to be involved and benefit from CPD activities. These includes lack of understanding of what could be professionally beneficial and how to choose those activities. Healthcare practitioners' awareness reflects on their engagement in the right CPD activities for their professions. In addition, it motivates them to take decisions to enroll in CPD activities that affect their career development. Failure to spread awareness and knowledge amongst HCPswill lead to reduced job satisfaction, stress and attrition from the profession. To take as an example the nursing profession were health services are diverse and complex, there is a need for nurses to retain advanced skills periodically. So, it's crucial to have strategies in order to maintain regular, well-targeted and evidence-based CPD activities (Katsikitis et al., 2013).

Competence-Based Curriculum

Competence is very much a contemporary currency in the health care professions. It carries with its traditional meanings that can be hard to escape from, especially when we start to talk about new models of professional development and new ways in which to regulate professional performance. A major stimulus for recent reform in medical education has been the desire to prepare graduates for LLL in a world of rapidly changing and expanding knowledge (Federation, 2002).

Professional education programs hold a key role in providing students with multiple opportunities to develop these and other skills in order to continuously acquire evidence and translate it into professional behaviors (McConnell et al., 2012).

Providers of health care services are being required to be more focused on quality and quality improvement. In a series of reports, the Institute of Medicine (IOM) has highlighted deficiencies in the health system, identified key factors contributing to the state of affairs, and made a number of recommendations. Of concern, IOM notes that the knowledge and skills of health care professionals (HCPs) are often not optimally used, and that problems arise because HCPs work in a system that does not adequately prepare them, or support them once in practice, to achieve the best for their patients. IOM concludes that the education and training of HCPs are in need of major overhaul, advocates that education and training (both pre-service and lifelong) need to be competency based (Donaldson et al., 2000).

The protection of the public by ensuring the high-quality education and training of health practitioners is just one of the objectives of the National Registration and Accreditation Scheme1 that regulates 14 health professions, including pharmacy (Snowball & Snowball, 2014). During the past decade, pharmacy educators have become increasingly aware of the need to focus on values that foster professionalism. The Commission further stated that pharmacy educators bear a responsibility to instill in students a clear sense of the profession's societal purpose and to encourage each student to develop a personal practice philosophy (Chan & Wulijii, 2006).

ACPE has endorsed SDL for students and supports the maintenance of a performance portfolio in their guidelines and standards (Chan & Wulijii, 2006). Introducing CPD to students early on in their curriculum would adhere to that standard. It has been suggested that to increase accuracy of students' self-assessment skills, frequent feedback must be given along with verification of specific self-assessment surveys. Therefore, careful planning and training must take place to increase the success of CPD for students (Chan & Wulijii, 2006).

While an appropriate, competency-based education can prepare a pharmacist to enter practice, no professional program can provide or develop all the knowledge, skills, attitudes, and abilities that a pharmacist will ever need. These require a combination of an appropriate pre-service educational foundation, in-service training, hands-on work experience, and LLL. For professionals, education is a continuum. The educational strategies, and competency- and outcomes-based approaches that are successfully used for

pre-service training must be maintained and expanded throughout the practitioner's career (Rouse, 2004).

Positive results have been reported with pharmacists trained in the CPD approach. Of the few studies that have evaluated CPD among student pharmacists, several have shown the benefits of implementing self-reflection exercises in student course work. In 2010, Briceland and colleagues studied the use of electronic portfolios among students during advanced pharmacy practice experiences (APPEs), concluding that the reflective essay component "proved to be a useful vehicle to demonstrate achievement of ability-based outcomes."(Briceland & Hamilton, 2010). Through the self-reflective essays, students also recognized the importance of LLL. Motycka and colleagues state that in order to advance and use selfa-ssessment skills, it is essential to validate the appropriate models, provide educators with theoretical background, and "embrace the culture in our educational programs where self-assessment is an essential element to successful professional practice."(Motycka et al., 2010). McMillan and colleagues also argue that "when students set goals that aid their improved understanding, and then identify criteria, selfevaluate their progress toward learning, reflect on their learning, and generate strategies for more learning, they will show improved performance with meaningful motivation."(McMillan & Hearn, 2008). Self-reflection in pharmacy school curriculum is clearly a step in the right direction and aligns with ACPE's 2007 Accreditation Standards and Guidelines, which recommends SDL for students.

Based on this demonstrated need for self-assessment early in the curriculum, introducing CPD training into the pharmacy school curriculum warrants additional research as an appropriate next step. Incorporating CPD training into pharmacy school curriculum may further advance student pharmacist development and encourage the practice of self-reflection and LLL. In a 2010 commentary, Janke stressed the importance of shifting focus to training students on CPD: "Students can become more versed in self-assessment, reflection, and planning and documentation strategies." Janke also discussed the importance of coaching and support throughout the process. Implementation of CPD will require appropriate training of student pharmacists and coaching of educators to provide students any assistance they may need during the CPD training process (Janke, 2010).

A study conducted at the School of Pharmacy and Pharmaceutical Sciences, University of Central Lancashire, United Kingdom, attempted to engage students enrolled in a master of pharmacy degree program with a CPD activity similar to that for pharmacists. While few students fully grasped the process, the authors concluded that "there is a need for students to be encouraged to take ownership of their undergraduate learning, to gain confidence in self-assessment, and to increase the value they place on reflection." Advanced students, such as doctor of pharmacy (PharmD) students in the United States, may find the CPD process easier to grasp (Dyke et al., 2009).

There are no US studies that have evaluated the effectiveness of a training program in helping pharmacy students write learning objectives and implement a CPD approach early in the pharmacy curriculum. This study fills this research gap by examining the effectiveness/ utility of a CPD training program (online and live) in helping first- and second-year pharmacy students write SMART (specific, measurable, achievable, relevant and timed) learning objectives and implement a CPD process as they progress through experiential training.

Our earlier study of first-year (class of 2013) PharmD students at the University of North Carolina Eshelman School of Pharmacy comparing live vs online CPD training found that, with focused training, PharmD students are capable of implementing principles of CPD.7 The second year of this study incorporated a revised method of educating students on how to write SMART goals and evaluated how changes in training strategy affect students' abilities to write these goals. The hypothesis of this study was that PharmD students would Show improvement writing SMART goals and that CPD would be incorporated throughout the PharmD curriculum (Dyke et al., 2009).

Related Research

In 2017, Leah Sera and Mary Lynn McPherson determined whether a study skills course taken by first professional year pharmacy students improved their self-assessment of study skills and strategies. By analyzing the student responses to the Learning and Study Strategies Inventory (LASSI), using an online assessment with questions in 10 subject areas: anxiety, motivation, concentration, test strategies, study aids, selecting main ideas, attitude, self-testing, information processing, and time management. Average percentile

scores increased significantly from the beginning to the end of the course in all 10 areas. Notably, average pre-course scores in seven subject areas (attention, concentration, self-testing, selecting main ideas, study aids, time management, and test strategies) were all below the 50th percentile, indicating a need for improvement in those skills to see increased academic success. This evaluation shows that a study skills course improves students' self-assessment of skills and attitudes associated with success in post-secondary education (Sera & McPherson, 2019).

In 2017, a study had done in Lebanon that investigated the views and assessed motivation, attitudes of pharmacists in Lebanon towards mandatory CE, its transition to CPD, and identify barriers to participation in CPD. As a result, half of the pharmacists who completed the questionnaire agreed that all the factors that were mentioned in the questionnaire motivated completing CPD, whereas 55.4% felt confident that CPD meets their needs. 78.4% felt confident in their abilities to assess what they have learned. 71.6% felt confident in their abilities to assess what additional CPD activity may be necessary. The majority of the pharmacists agreed that accessibility of group learning activities (location/distance) (69.6%), job restrictions (76.3%) and lack of time (80.6%) were the most essential barriers against participation in CPD. The attitude and motivation to CPD were positive in this study. Accessibility of group learning activities due to distance and location, job restrictions and lack of time were the major barriers to participation in CPD. Potential solutions can be sought to address these issues (Saade et al., 2018).

In Fall 2014, the Roseman University College of Pharmacy implemented a CPD program in the didactic curriculum of a three-year PharmD program, and evaluate associated outcomes. The initial CPD program was implemented in the didactic curriculum of the PharmD program in 2014-2015. Barriers were identified and strategies adopted to overcome the barriers. A revised CPD curriculum was implemented in the 2015-2016 academic year. As a result, student and faculty evaluations of the course were conducted, and students' perceived capabilities in the various skills related to professional development were measured. The student ratings of the course were acceptable. The majority of faculty members found the CPD curriculum valuable for students. Implementation of a CPD process during the didactic curriculum for PharmD students is feasible and beneficial to students' professional development. This CPD model

provided students with an opportunity to develop self-directed LLL skills and prepared them to transition to practice-based learning in their final year of the program (Unni et al., 2019).

Between 2012 and 2013, a study in Australian sought to determine how competence training for pharmacists may enhance quality in their professional development. As a result, some Australian pharmacists are not familiar with their NCS. Pharmacists also have limited understanding of the CPD framework. Of concern, a profession's mandatory requirements around self-regulation of competence are not always upheld in practice. Introduction of both elements (NCS and CPD Framework) earlier, during undergraduate studies, may translate to familiarity and more meaningful use through appropriate CPD habit formation. This is one example of how competence training may enhance quality in professional development. This finding may be applicable to all pharmacy educators internationally (Rose Nash et al., 2017).

A study had done by Vico C.L,.etc. in 2012 in China, have shown that small group learning with active interactions is effective in enabling students to develop themselves as independent learners beyond graduation. The study aim was to evaluate life-long learning outcomes through the work of small group teaching and learning for a class of undergraduate nursing freshmen during one academic year. In this study a mixed-methods approach was used to evaluate the critical thinking (CT), effective group process (GP), and self-directedness (SDL) of 99 freshmen with a self-assessment questionnaire before and after their learning activities in three nursing courses, and to identify themes from a total of six focus group interviews with the students and teachers. As a result, the CT, GP and SDL results obtained from self-assessment did not indicate significant differences. With a developmental perspective, life-long learning may be better developed and evaluated over a longer period of time in the nursing program (Chiang et al., 2013).

In 2011 a study by Toyin T. and Brianna F., etc. purposed to evaluate a live and online training program for first year pharmacy students in implementing Continuing CPD principles, writing SMART learning objectives, and documenting learning activities prior to and during a hospital introductory professional practice experience. Live training or online training was done to introduce the concept of CPD in practice. The main outcomes were implementation of CPD principles through completed pre-rotation education action

plans with specific, measurable, achievable, relevant and time-bound learning objectives; completed learning activity worksheets post-rotation indicating stimuli for learning, resources used and accomplished learning; and documented suggestions and content feedback for future lectures and pharmaceutical care lab experiences. The study showed that live trainees performed significantly better than online trainees in writing SMART learning objectives. With focused training, students are more capable of implementing principles of CPD (T. Tofade et al., 2011).

Toyin t., etc in 2010-2011 condacted a study to determine whether a 2-year CPD (CPD) training program improved first-year (P1) and second-year (P2) pharmacy students' ability to write SMART learning objectives. The first year students completed live or online CPD training, including creating portfolios and writing SMART objectives prior to their summer introductory pharmacy practice experience (IPPE). In year 2, P1 and P2 students were included. SMART learning objectives were graded and analyzed. As a result, on several objectives, the 2011 P1 students scored higher than did the P2 cohort. In 2011, P2 students outscored their own performance in 2010. In 2011, P1 students who had been trained in online modules performed the same as did live-session trainees with respect to SMART objectives. As a conclusion, with focused online or live training, students are capable of incorporating principles of CPD by writing SMART learning objectives (T. Tofade et al., 2012).

In 2010, Suzanne M. Henwood reported the attitudes of UK radiographers to mandatory CPD following the introduction of a mandatory policy, compared to a survey undertaken prior to the mandate being introduced. By using an electronic survey was advertised within 152 hospitals, across a range of hospital types. The study showed that the overall attitude score had not increased significantly, demonstrating an ongoing relatively ambiguous attitude towards CPD. There was an increase in the number of radiographers recording CPD, though radiographers still expressed discontent over the need to evidence CPD activity. The study showed a change in the perceived primary barrier to CPD away from funding to time: time to undertake CPD; and time to record CPD activity. While the activity score had not significantly increased, a broader view of what constitutes CPD was evidenced, away from the previous narrow focus on attendance-based activities. Support for CPD also showed no significant change, suggesting that the onus for CPD still

predominantly remains with the individual radiographer. As a conclusion for the study, the introduction of a mandatory CPD policy has not significantly impacted on the attitudes of radiographers towards CPD activity. The study raises a number of questions which would benefit from further study and highlights some ongoing issues which impact on CPD in practice (Henwood & Flinton, 2012).

In 2008, Renee a. Bellanger and Thomas c. Shank assessed the knowledge and attitudes of Texas pharmacists regarding CPD. 471 pharmacists completed an online survey (9.5% response rate), the pharmacists surveyed understood their need to maintain professional competence. A minority of the pharmacists (12%) maintained a written record or planned to document their progress. Many pharmacists felt that CPD as it is understood by the respondents may not assist them in improving their professional development (Bellanger & Shank, 2010).

CHAPTER III

Method

This chapter presents the methodology employed in this study, and explains the research design and methods used to explore the experiences and preparedness of pharmacy students towards CPD and LLL at Northern Cyprus and other 6 countries. A prospective mixed-method study carried involving pharmacy students consisting of three parts; firstly developing a scale to evaluate the students' attitude toward CPD and preparedness to become lifelong learners, secondly an international cross-sectional study to evaluate the students' attitude toward CPD and preparedness to become lifelong learners in seven different countries, and finally preparing lifelong learners for the practice of pharmaceutical care in an ever-changing world by developing and applying a faculty based CPD simulation program and assess its feasibility by pilot testing in 5th year students. In this chapter, we discuss the detailed sections of each part of the study: the study design and implementation; participants; data collection; and data analysis.

This study was approved by the Institutional Review Board (IRB) of Near East University Hospital approved the study and assigned this research as an educational activity. The questionnaires were anonymous and completing a questionnaire was on a voluntary basis. Responses were treated confidentially and no patients were involved. The study was carried in accordance to the Declaration of Helsinki.

An international cross-sectional study to evaluate the students' attitude toward CPD and preparedness to become lifelong learners in seven different countries

This part aimed to assess and compare the attitude toward CPD and its associated factors among last year pharmacy students, and their preparedness to become lifelong learners.

Study design and population

A cross-sectional study carried between May and December 2019. A SPLLL self-administered questionnaire administered to the final year students of 7 out of 8 invited pharmacy schools who accepted to participate. The schools were Near East University from Cyprus, Ankara University from Turkey, from Jordan University of Jordan,

University of science and technology in Yemen, from Malaysia University of Science Malaysia, From Indonesia 17 August 1945 University Jakarta, and finally University of Ahmadu Bello in Nigeria. The survey was translated into Turkish for universities teaching in Turkish using the appropriate method (1) a forward and backward translation were made separately by two translators; (2) the translations were evaluated by the research committee and (3) a pilot test with Turkish students in Near East university was conducted to assess the clarity of the questions.

Data collection

All final year students from these schools were invited to voluntarily participate in the study after providing an oral consent form and fill the questionnaire using a paper-based version (Cyprus, Turkey, Yemen and Nigeria) or an online survey using Survey Monkey (Jordan, Malaysia and Indonesia). In addition, students were advised that their decision to participate would not affect their academic results or influence their student-teacher relationships. The process of administering the questionnaire, obtaining consent and providing information regarding the study to participants was carried by an academician affiliated to the same setting. Schools in which student's filled online survey used to send reminders twice weekly for 3 weeks. Responses from each school were coded and entered into Microsoft Excel by two research authors.

The questionnaire contains 5 sections and 51 items including information about the sociodemographic characteristics of the sample, knowledge and experience of CPD Activities, perceptions of students to CPD, factors affecting motivation towards CPD, and barriers to participation in CPD. A five-point Likert scales intended to measure the students' attitude toward CPD and its associated factors using a series of simple statements with, (ranging from 1 strongly disagree, 2 disagree, 3 natural, 4 agree and 5 strong agree) (appendix A).

Statistical Analysis

Data was analyzed using the Statistical Package of the Social Sciences version 23. Descriptive statistics were calculated for all study variables. This includes the mean and standard deviation for continuous measures, counts and percentages for categorical

variables. The Chi-square test was used for bivariate analysis of categorical variables, whereas Student test were used for comparison of means between two groups. ANOVA and Kruskal-Wallis tests were used to compare between three groups or more. Pearson correlation coefficient was used to correlate between quantitative variables. Bonferroni adjustment was used for ANOVA post hoc tests of between groups comparison. Statistical significance was set at $p<0.05$.

Preparing lifelong learners for the practice of pharmaceutical care in an ever-changing world by developing and applying a faculty based CPD simulation program and assess its feasibility by pilot testing in 5th year students

Participants

A CPD simulation course was introduced to a cohort of fifth year pharmacy students at NEU in Northern Cyprus through the 2018-2019 academic year.

Study Design

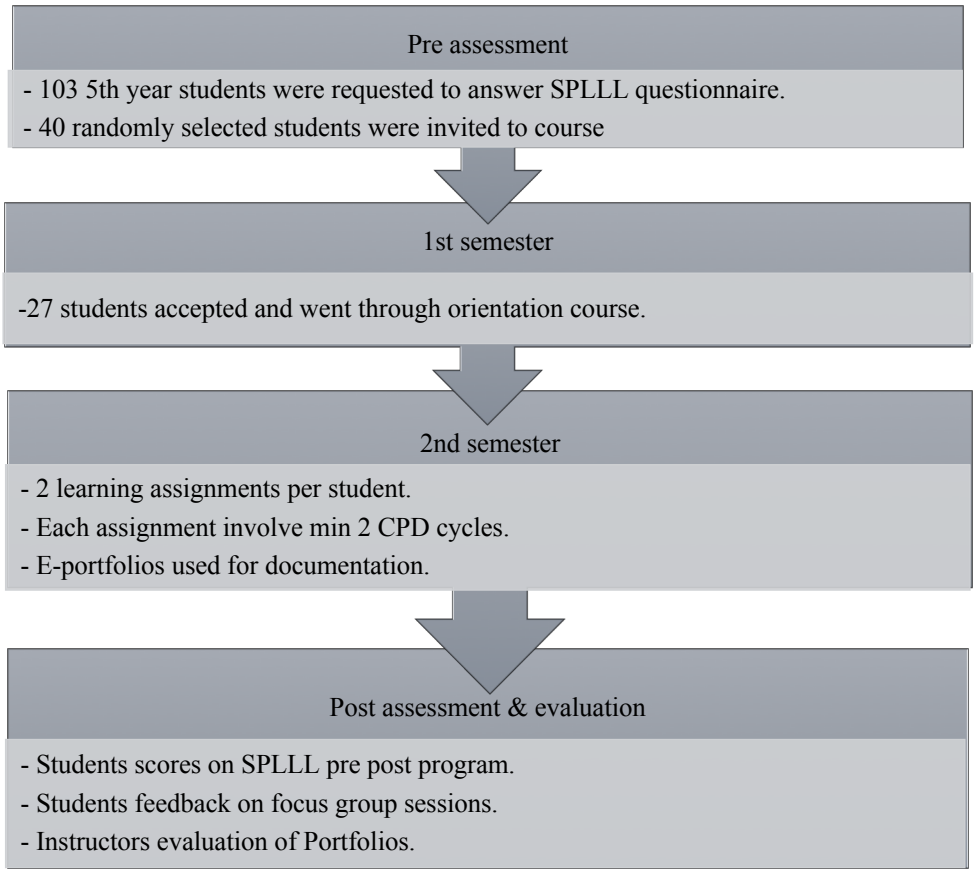
The course objective was to improve students' competence in CPD and LLL through an interactive orientation course in the first semester followed by a self-directed learning (SDL) assignment required from each student during their final experiential practice.

A mixed-method design was adopted to evaluate the implementation outcomes. Students' preparedness for CPD and LLL was assessed using students' preparedness for lifelong learning SPLLL self-administered questionnaire, which was developed and validated by the research group, and delivered pre-post program.

Students' feedbacks were also evaluated using an exploratory qualitative approach from a focus group with the students at the end of the study period. Each student was required to reflect on and document his learning using a student portfolio, which was also evaluated by the instructors (see figure 7).

Figure 7

Implementation Study Design & Flow



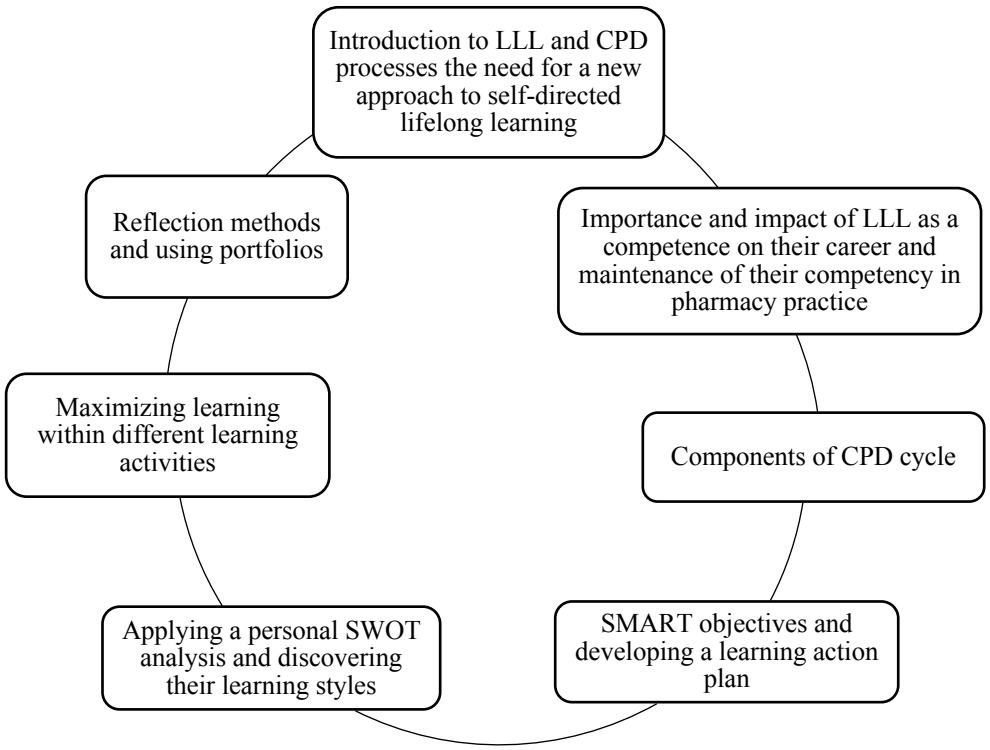
Study Implementation

The course was launched as a longitudinal elective course named the CPD course. The course instructors received prior training in CPD and LLL skills development conducted by experts from the ACPE and a pharmacy education consulting company. The training involved an introduction to the concept, and relevant importance of CPD, as well as the planned process for implementation.

In the students' orientation course, the course was delivered as interactive didactic lectures and workshops. The students were provided a 2-hour lecture with training on a weekly basis (see figure 8).

Figure 8

CPD Course content



In the second part of the CPD program, learning assignments were required since students were at practice sites. Webinar sessions were used to guide the required assignments with a hotline for individual queries and instructor guidance. The students were also provided written guidance on the course description and the expected question.

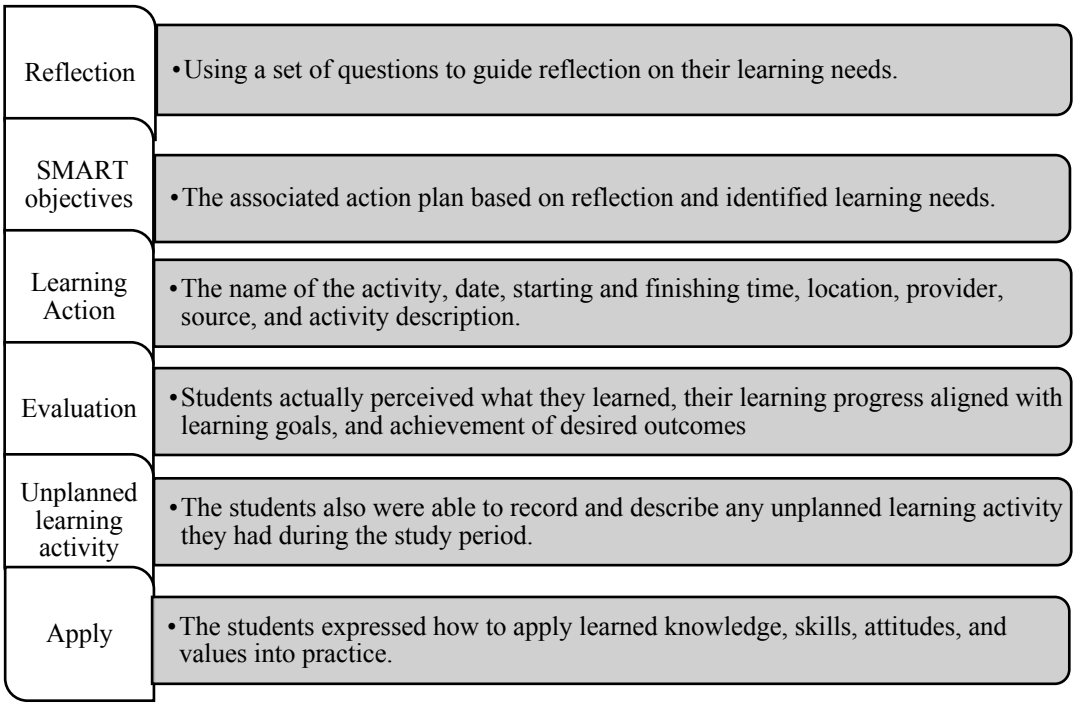
Assessment and Evaluation

Weekly activities and assignments. During the orientation course of the first semester, weekly assignment activities were required from the students individually or in groups as a formative assessment to achieve course objectives. Following each assignment or homework task, instructors discussed the assignments with students in class to elaborate on their performance and reinforce positive responses. Weekly assignments had scores that represented 5-10% of the total mark of the course.

Student's Portfolio. Students were required to complete 3 CPD cycles throughout the year: the first cycle was in the first semester, and a minimum of two cycles per student were required in the second semester. For each cycle, each student was required to use a minimum of two different learning activities and document all of them using their personal e-portfolio (see figure 9). A validated rubric was used to evaluate the portfolios by the research team. The rubric involved the following items (reflection, SMART objective plan, learning activity, evaluation, apply) (appendix B). Each CPD cycle assignment in the second semester formed 20% of the total percentage of the course (total of 40%).

Figure 9

Portfolio sections



Students' preparedness for LLL (pre-post self-assessment questionnaire). A comprehensive literature review was conducted to develop the CPD course content and an assessment tool. The developed questionnaire tool consisted of 5 sections and 59 questions recorded on a five-point Likert-type scale. The tool was developed and validated using the Delphi method followed by pilot testing and exploratory factor analysis using a sample of 521 students in the last year of pharmacy programs from 7 countries. The self-

administered questionnaire tool was used to assess changes in students' self-evaluation of their preparedness for CPD and LLL. The questionnaire involved awareness associated with CPD and LLL, SDL skills and attitudes, the practice of CPD cycle components and activities in the past months, motivation factors and perceived barriers to participation in CPD activities.

Students' evaluation of the CPD course (focus groups). Qualitative feedback was obtained from students using the focus group (FG) approach at the end of the study (see Table 1). A semi-structured questioning route was developed by the authors and used for three developed groups. The interview questions were designed to elicit their perceptions of the following aspects: the course settings (aim, achievement, content, organization, time, assessment methods and instructors), their experience of skills development (e.g. SMART objectives plan, personal SWOT analysis, learning styles, CV development and personal portfolios), benefits and strengths of the course in enhancing student learning, barriers and weakness of the course that hindered students' learning, experiences students enjoyed most in the course and their suggestions for improving the courses in the future. Three homogeneous student focus groups (FGs) were arranged based on the preferred medium of communication; FG1 and FG2 were conducted in Turkish language and FG3 in English language. The interviews were done in the same format to allow for potential comparison between groups during the analysis. Before the commencement of the focus group, students were asked if they would be willing to participate in an approximately 30-minute interview to provide feedback on the CPD course. All participants were informed that their interview will be recorded and assured that their lack of participation in the interview would have no effect on their grade and accordingly an oral consent was acquired.

The facilitators of the interviews were oriented in acquiring responses and handling of qualitative interviews. An independent observer was presented during the interview that took detailed notes and observed the group dynamics. Each focus group lasted between 30 and 40 minutes and all interviews were tape-recorded and subsequently transcribed verbatim by an independent experienced transcriber and translator.

Table 1

Qualitative Feedback from Student Evaluation of CPD Course (Focus Group Session)

Questioning route	**A semi-structured questioning route was developed by the authors and used for three developed groups.**
Session questions	1. The course settings (aim, achievement, content, organization, time, assessment methods and instructors), 2. Their experience of skills development (e.g. SMART objectives plan, personal SWOT analysis, learning styles, Curriculum Vitae (CV) development and personal portfolios), 3. Benefits and strengths of the course in enhancing student learning, 4. Barriers and weakness of the course that hindered students' learning, 5. Experiences students enjoyed most in the course and their suggestions for improving the courses in the future.
Student focus groups (FGs)	Three homogeneous student FGs were arranged based on the preferred medium of communication; a. FG1 and FG2 were conducted in Turkish language b. FG3 in English language.
Informed consent	a. Before the commencement of the focus group, students were asked if they would be willing to participate in an approximately 30-minute session to provide feedback on the CPD course. b. All participants were informed that their session will be recorded and assured that their lack of participation in the session would have no effect on their grade.
Qualitative data manipulation	a. The first stage involved transcription carried by the principal researcher and reviewed by 2nd author for accuracy and annotated for nonverbal content. b. Following transcription the script was translated into English using backward and forward translation method done by the principal researcher and the 2nd author (bilingual English, Turkish); then by a professional translator (bilingual with Turkish as a first language) c. Following translation, the third stage involved content analysis of the data sets to develop categories and themes.

Inductive thematic analysis	Inductive thematic analysis of the transcripts was undertaken based on six steps (Braun & Clarke, 2006): a. becoming familiar with the data; generating initial codes; b. searching for themes; c. reviewing themes; d. defining and naming themes f. finally producing the report. - The principal researcher reviewed all the transcripts several times, coded the data and extracted the main emerging themes. - A second investigator reviewed the transcripts and the key themes thus strengthening the validation of study results. - All authors discussed the themes, codes, similarities, and differences until agreement was reached on the key themes and subthemes.

Data analysis

Qualitative data manipulation and analysis. Data analysis involved three stages, transcription - translation - and analyzing. The first stage involved transcription carried by the principal researcher and reviewed by 2nd author for accuracy and annotated for nonverbal content. Following transcription, the script was translated into English using backward and forward translation method done by the principal researcher and the 2nd author (bilingual English, Turkish); then by a professional translator (bilingual with Turkish as a first language). Following translation, the third stage involved content analysis of the data sets to develop categories and themes.

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Quantitative statistical analysis. The statistical analysis of the quantitative data was conducted using SPSS version 23.0 (IBM Corporation, US). Categorical variables, such as gender, age, nationality, and future plans, were presented in frequencies and percentages. In addition, the continuous variables of the pretest and posttest scores of the CPD simulated program course were expressed as the mean ± SD, and the unpaired t-test was used to compare the control and the intervention groups. The paired t-test was applied to determine the mean and median significant differences between the pretest and posttest scores of the intervention group. P-value < 0.05 was considered statistically significant.

CHAPTER IV

Findings and Discussion

In this chapter, we will elaborate on the major findings and themes related to Students' preparedness to become lifelong learners. The findings are organized in accordance with the three parts of the research.

Students' attitude toward CPD and preparedness to become lifelong learners in Seven different countries

Demographic characteristics

From 1289 last-year students in seven different countries, 505 responded to fill the questionnaire (39%). 463 (91.7%) were aged between 20 to 25 years old, and 35(6.9%) were aged 26-30 years old. 325 (64.4%) of the students were females, in all country's female students are majority except in Nigeria female were 34(30.1%) [Table.2]. 129(25.5%) of the students were from Indonesia, followed by students from Nigeria 117(23.2%). In Near East University, 16(23.9%) were locals, whereas 34(50.7%) were Turkish, 5(7.5%) were Egyptian, the rest were Nigerian 4(6%), Iraqi 4(6%), and 4(6%) Syrian. In Ankara University, 64(97%) were locals, whereas the rest were from other countries. In Jordan University, 50(87.7%) where locals and5(8.8%) were Iraqi and the rest were from other countries. All the participant students in Ahmadu Bello University in Malaysia were Malaysian 39(100%). In Yemen, 31 (91.2%) were local students, whereas the others were Syrian 2(5.9%) and Palestinian 1(2.9%). 159(31.5%) from the students' future plans is to become community pharmacist, 44(65.7%) from them are Cypriot students, whereas 3 (7.7%) from Malaysian students' future plan plans is to become community pharmacist. While 17(43.6) of Malaysian students want to become hospital pharmacist, while 3(8.8%) of Yemeni students were planning to become hospital pharmacist. 98(19.4%) pf the students wanted to become clinical pharmacist, 22(38.6%) of them were Jordanian students. The other students wanted to become Industrial Pharmacist 93(18.4%), 82(16.2) academic, and 21(4.2%) marketing [Table 2]. 254

(50.3%) of the students have CV which 96(74.4%) of them were Indonesian students [Table 2].

Table 2

Demographic characteristics of the participants

Section 1: Demographic Data									
Variable			Country						
		Total	Turkey	Indonesia	Jordan	Malaysia	Nigeria	Yemen	Cyprus
		505	66(13.1%)	129(25.5%)	57(11.29%)	39(7.7%)	113(22.38%)	34(6.7%)	67(13.27%)
Gender	Male	180(35.6%)	21(31.8%)	19(14.7%)	6(10.5%)	11(28.2%)	79(69.9%)	14(41.2%)	30 (44.8%)
	Female	325(64.4%)	45(68.2%)	110(85.3%)	51(89.5%)	28(71.8%)	34(30.1%)	20(58.8%)	37(55.2%)
Age	20-25	463(91.7%)	66(100%)	125(96.9%)	57(100%)	39(100)	87(77%)	32(94.1%)	57(85.1%)
	26-30	35(6.9%)	0	1(0.8%)	0	0	25(22.1%)	2(5.9%)	7(10.4%)
	> 30	7(1.4%)	0	3(2.3%)	0	0	1(0.9%)	0	3(4.5%)
Future Plan	Community Pharmacist	159(31.5%)	39(59.1%)	7(5.4%)	10(17.5%)	3(7.7%)	45(39.8%)	11(32.4%)	44(65.7%)
	Hospital Pharmacist	120(23.8%)	25(37.9%)	43(33.3%)	11(19.3%)	17(43.6)	15(13.3%)	3(8.8%)	6(9%)
	Clinical Pharmacist	98(19.4%)	14(21.2%)	18(14%)	22(38.6%)	12(30.8%)	15(13.3%)	7(20.6%)	10(14.9%)
	Industrial Pharmacist	93(18.4%)	8(12,1%)	48(37.2%)	7(12.3%)	2(5.1%)	12(10.6%)	9(26.5%)	7(10.4%)
	Academic (master, Ph.D)	82(16.2)	17(25.8%)	5(3.9%)	15(26.3%)	5(12.8%)	22(19.5%)	8(23.5%)	10(14.9%)
	Marketing	21(4.2%)	1(1.5%)	4(3.1%)	6(10.5%)	0	3(2.7%)	6(17.6%)	1(1.5%)
	others	19(3.8%)	0	0	3(5.3%)	0	13(11.5%)	3(8.8%)	0
Having CV		254(50.3%)	42(63.6%)	96(74.4%)	24(42.1%)	16(41%)	31(27.4%)	16(47.1%)	29(43.3%)

Students' Preparedness for LLL scale

Some significant differences were found between the fifth-year students in different countries in total competence scores (knowledge, skills, attitude) and the domains of the scale as shown in [table 3]. Regarding the knowledge toward CPD, students in Yemen scored the highest score with significant differences with Indonesia and Cyprus (47.15±11.39 vs 40.28±10.8, $p>0.015$; 40.31±6.45, $p>0.037$) respectively. Students in Jordan showed a high knowledge toward CPD than some other countries such as Indonesia and Cyprus with significant differences as shown in table 3,4.

Regarding the SDLLL skills, students in Turkey and Nigeria showed high skills scores than other countries. Both of them had significant differences with Indonesia and Malaysia as shown in table 3,4.

The SDLLL Attitudes scores were higher than the other domains, whereas Cyprus and Indonesia had lower sores than the other countries with significant differences with Jordan, Malaysia and Nigeria [See table 3,4].

Regarding the practice, Students in Yemen then Turkey had the highest practice scores 39.15±8.12; 38.84±6.14) respectively. Whereas students in Cyrus had the lowerest score (31.96±4.17) [See table 4], followed by student in Malaysia (34.74±7.04). Students in Cyprus had significant differences with the other countries in the study, except Malaysia [see table 4,5]. While Indonesia had higher practice score than Malaysia and Nigeria with significant differences (38.78±6.98 vs 34.74±7.04, $p>0.04$; 35.6±8.7, $p>0.013$), respectively [See table 4,5].

In competence total, Students in Jordan had the highest score (143.82±18.96) while student in Cyprus had the lowerest scores with significant differences with student in Nigeria score (131.51±14.23 vs 142.51±17.79; $p>0.002$), students in Jordan, and Yemen (131.51±14.23 vs 143.82±18.96, $p>0.003$; 143.15±23.83, $p>0.035$, respectively). Also, there was a significant different between the competence total score of students in Indonesia with students in Nigeria, Jordan, and Yemen and (131.49±19.4 vs 142.51±17.79, $p>0.000$; 143.82±18.96, $p>0.001$, 143.15±23.83, $p>0.02$ respectively) [See table 4,5.

Table 3.

Comparison of the competence components score (knowledge, skill, attitude) and practice of the participants P>0.

	Turkey			Indonesia			Jordan			Malaysia			Nigeria			Yemen			Cyprus		
	Knowledge	Skill	Attitude	Knowledge	Skill	Attitude	Knowledge	Skill	Attitude	Knowledge	Skill	Attitude	Knowledge	Skill	Attitude	Knowledge	Skill	Attitude	Knowledge	Skill	Attitude
Turkey				.619	.018	.465	.687	.797	.240	.912	.035	.366	1.000	1.000	.069	.513	.854	.986	.768	.140	.213
Indonesia	.619	.018	.465				.012	.725	.000	1.000	.994	.002	.450	.001	.000	.015	.906	.214	1.000	1.000	.985
Jordan	.687	.797	.240	.012	.725	.000				.160	.568	1.000	.543	.611	1.000	.999	1.000	.907	.044	.942	.000
Malaysia	.912	.035	.366	1.000	.994	.002	.160	.568	1.000				.887	.010	1.000	.112	.751	.932	1.000	.974	.001
Nigeria	1.000	1.000	.069	.450	.001	.000	.543	.611	1.000	.887	.010	1.000				.397	.736	.798	.679	.041	.000
Yemen	.513	.854	.986	.015	.906	.214	.999	1.000	.907	.112	.751	.932	.397	.736	.798				.037	.984	.091
Cyprus	.768	.140	.213	1.000	1.000	.985	.044	.942	.000	1.000	.974	.001	.679	.041	.000	.037	.984	.091			

Table 4

Participants' preparedness for LLL scale (Mean±SD)

Sections	Country						
	Turkey (N=66)	Indonesia (N=129)	Jordan (N=57)	Malaysia (N=39)	Nigeria (N=113)	Yemen (N=34)	Cyprus (N=67)
Knowledge Out of 70	43±10.52	40.28±10.8	46.05±11.25	40.54±8.43	42.94±12.33	47.15±11.39	40.31±6.45
Skills Out of 60	46.48±5.48	43.51±6.23	44.96±6.23	42.97±4.46	46.62±5.46	44.85±8.55	43.84±5.61
Attitude Out of 65	50.1±5.56	48.15±6.92	52.8±5.22	52.82±4.75	52.96±6.43	51.15±9.97	47.36±6.81
Total Competence Out of 195	139.55±17.44	131.94±19.4	143.82±18.96	136.13±11.05	142.51±17.79	143.15±23.833	131.51±14.23
Practice Out of 60	38.84±6.14	38.78±6.98	38.42±8.5	34.74±7.04	35.6±8.7	39.15±8.12	31.96±4.17

Table 5

Comparison of the total competence and practice score of the participants P>0.05

Competence / **Practice**	Turkey	Indonesia	Jordan	Malaysia	Nigeria	Yemen	Cyprus
Turkey		0.077	0.843	0.965	0.937	0.964	0.133
Indonesia	1.000		**0.001**	0.862	**0.000**	**.022**	1.000
Jordan	1.000	1.000		0.376	0.999	1.000	**0.003**
Malaysia	0.093	**0.040**	0.188		0.470	0.638	0.862
Nigeria	0.078	**0.013**	0.208	0.996		1.000	**0.002**
Yemen	1.000	1.000	0.999	0.135	0.166		**0.035**
Cyprus	0.000	**0.000**	**0.000**	0.481	**0.021**	**0.000**	

The practice score in age group 20-25 (N=463) was higher than other groups with significant difference with age group 26-30 (N=35) (138.12±18.37 vs 133.63±19.94; p=0.038). Whereas there were no significant between gender wither with total competence or domains.

The students who had CV (N=254) scored significantly higher in practice than students who hadn't CV (N=251) (38.27±7.12 vs 35.38±7.88; p=0.000), whereas there was not any significant between them in any other domain.

Regarding the future plan of the students, the students who had a plan to become community pharmacist (N=159) had a lower practice score than students who didn't chose community pharmacist as their future plan (N=346) as shown (35.54±6.99 vs 37.43±7.86; p=0.007). The attitude of students who wanted become clinical pharmacists (N=98) had a higher attitude score than other students (N=407) (52.52±6.14 vs 49.96.43±7.00; p=0.000). The practice score of students who wanted to become industrial pharmacist (N=93) was higher than others (N=412) (39.95±7.09 vs 36.13±7.59; p=0.000). While the students who had plan to become an academic (MSc, PhD) (N=82), had a higher score in the total competence than others (N=423) (142.85±17.57 vs 136.65±18.57; p=004), as well as in the knowledge and attitude (44.66±10.35, vs 41.92±10.82, p=032, 52.63±6.00 vs 50.04±7.00; p=0.00, respectively).

In Turkey, the students who had CV (N=42) scored significantly higher in Knowledge, skills and total competence than students who hadn't CV (N=24) (45.57±8.58 vs 38.50±12.18, p=0.008; 47.60±5.50 vs 44.54±4.98, p=0.02; 143.9±15.59 vs 131.92±18.19, p=0.010).

In Indonesia, students aged 20-25 (N=125) had significant higher knowledge and total competence score than the students aged more than 30 years old (N=3) (40.67±10.59 vs 23.67±6.03, p=0.007, 171.40±23.54 vs 142.33±31.09; p=0.038, respectively). The attitude of students who wanted become clinical pharmacists (N=18) had a higher attitude score than other students (N=111) (51.28±6.39 vs 47.64±6.89; p=0.000). The knowledge, skills and total competence scores of students who wanted to become industrial pharmacist (N=48) was higher than others (N=81) (42.77±9.76, vs 38.80±11.17, p=0.037; 44.98±6.82 vs 42.64±5.71; p=0.049; 176.31±23.54 vs 167.41±23.78; p=0.041 respectively).

In Jordan, the attitude of students who wanted become clinical pharmacists (N=22) had a higher attitude score than other students (N=35) (55.50±4.58 vs 51.11±4.92; p=0.001).

The students who had CV (N=24) scored significantly higher in practice and total competence than students who hadn't CV (N=33) (41.22±7.34 vs 36.30±8.76, p=0.022; 150.21±14.66 vs 139.18±20.54, p=0.022), whereas there was not any significant between them in any other domain.

In Nigeria, the students who had a plan to become community pharmacist (N=45) had a lower attitude score than students who didn't chose community pharmacist as their future plan (N=68) as shown (51.20±5.35 vs 54.12±6.85; p=0.013). The knowledge, practice and total competence scores of students who wanted to become hospital pharmacist (N=15) were lower than others (N=98) (33.2±11.56, vs 44.43±11.8, p=0.002; 25.93±8.95 vs 37.08±7.69; p=0.000; 129±26.01 vs 144.58±15.33; p=0.001 respectively). The skills, attitude, total competence, and practice scores of students who wanted to become industrial pharmacist (N=12) were higher than others (N=101) (49.83±3.09, vs 46.24±5.56, p=0.003; 56.67±4.29 vs 52.51±6.52, p=0.008; 152.58±10.97 vs 141.32±18.1; p=0.006; 40.75±5.67 vs 34.99±8.82, p=0.006 respectively).

In Cyprus, the attitude and total competence scores were higher in age group 20-25 (N=57) than age group 26-30 (N=7) in (48.16±6.47 vs 40.86±7.94, p=0.019; 133.02±12.997 vs 117.86±19.5, p=0.019)

The Perceptions of Students to CPD

359 (71.1%) of the students preferred to learn within clinical practice, and 348 (69%) preferred to be assessed in their practice with direct observation. Whereas 285(56.5%) of the students preferred to learn from research and 227(45%) preferred knowledge assessment programs (Exams, HomeWorks, quizzes etc.) to assess their learning. [Table 6]

Regarding the students' opinion of the CPD benefits, 380 (75.2%) of the students agreed that CPD enhance and maintain their professional knowledge, skills, attitudes and values, majority of them were students in Nigeria and Malaysia. While 374(74.1%) of students agreed that CPD enhances status of the profession with other health practitioners. Whereas

148(29.2%) of the students disagreed that CPD enhances theirselves / public confidence. [Table 6]

Participating in e-learning programs and professional websites or apps was the effective form of CPD according to the students' opinion 334(66.2%) followed by conducting a research 324 (63.8%). Whereas learning from non-standardized internet resources (YouTube, Wikipedia, etc.) was the less effective form of CPD activities 286 (56.4%). [Table 6]

243(48.1%) of the students learned about CPD in the university while 152(30.1%) from internet. Whereas only 48(9.5%) of them learned about CPD in high school. [Table 6]

225(44.6%) of the students preferred to have CPD activities after graduation according to their needs, while 147(29.1%) preferred to have CPD activities monthly. However, 42(8.3%) preferred to have CPD activities twice a month, and 40(7.9%) once a year. [Table 6]

170(33.7%) of the students preferred to have CPD activities after graduation as an extra curriculum according to their needs, 141(27.9%) monthly, and 42(8.3%) once a year. [Table 6]

As group learning activities, workshops were most preferred group learning activity for 132(26.2%) of the students, followed by online courses and blended learning activities (Medscape, Up-to-date, Coursera, etc.) 115(22.8%), whereas 22(4.4%) seminars. [Table 6]

Table.6.

Perception of participants to CPD

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
40. I prefer to learn with in clinical practice.	15(3%)	14(2.8%)	11(23.2%)	221(43.8%)	138(27.3%)
41. I prefer to learn from research.	14(2.8%)	27(5.3%)	179(35.4%)	218(43.2%)	67(13.3%)
42. I prefer direct observation of performance in practice as an assessment tool.	14(2.8%)	16(3.2%)	127(25.1%)	238(47.2%)	110(21.8%)
43. I prefer knowledge assessment programs (Exams, HomeWorks, quizzes etc.) to assess my learning.	44(8.7%)	61(12.1%)	173(34.3%)	168(33.3%)	59(11.7%)
44. I prefer feedback on annual performance review as assessment tool.	14(3.4%)	23(4.6%)	174(34.5%)	223(44.2%)	68(13.5%)
45. In my opinion the following are benefits of CPD:					
A) Improves my performance as student or practitioner	6(1.2%)	15(3%)	111(22%)	255(50.5%)	118(23.4%)
B) Enhances status of the profession with other health practitioners	11(2.2%)	16(3.2%)	104(20.6%)	261(51.7%)	113(22.4%)
C) Enhances status of the profession with the public	10(2%)	10(2%)	119(23.6%)	245(48.5%)	121(24%)

D) Enhances my career prospects				10(2%)	15(3%)	110(21.8%)	243(48.1%)	127(25.2%)
E) CPD Keep me up-to-date				4(1.4%)	8(1.6%)	132(26.2%)	218(43.2%)	140(27.7%)
F) Enhance and maintain my professional knowledge, skills, attitudes and values				7(1.4%)	15(3%)	103(20.4%)	239(47.3%)	141(27.9%)
G) Motivate me to apply the new-learned knowledge				12(2.4%)	12(2.4%)	120(23.8%)	233(46.2%)	128(25.3%)
H) Enhances myself / public confidence				11(2.2%)	15(3%)	122(24.2%)	226(44.8%)	131(25.9%)
46. In my opinion the following are the effective forms of CPD activities:								
A) Reading articles from Scientific Journals				21(4.2%)	26(5.1%)	140(27.7%)	223(44.2%)	95(18.8%)
B) Attending Workshops				24(4.8%)	26(5.1%)	145(28.7%)	205(40.6%)	105(20.8%)
C) Attending to conferences, seminars and professional meetings.				7(1.4%)	34(6.7%)	144(28.5%)	203(40.2%)	117(23.2%)
D) Reading Manufacturers Literature (ex. brochure, leaflets, etc.)				12(2.4%)	21(4.2%)	161(31.9%)	222(44%)	89(17.6%)
E) Participating in E-learning programs and professional websites or apps. (Medscape, Up-to-date, Coursera, webinars, etc.)				17(3.4%)	29(5.7%)	125(24.8%)	217(43%)	117(23.2%)
F) Learning from non-standardized internet resources (YouTube, Wikipedia, etc.)				16(3.2%)	27(7.3%)	166(32.9%)	194(38.4%)	92(18.2%)
G) Conducting a research				19(3.8%)	14(2.8%)	150(29.7%)	217(43%)	105(20.8)
48. How often would you prefer to have CPD activities after your graduation? (Check one answer √)				**According to my need**	**Twice per month**	**Monthly**	**2 times per year**	**Once per year**
				225(44.6%)	42(8.3%)	147(29.1%)	51(10.1%)	40(7.9%)
49. How often you prefer to have CPD activities as an extra curriculum? (Check one answer √)				170(33.7%)	64(12.7%)	141(27.9%)	88(17.4%)	42(8.3%)
47. If familiar with any of CPD or/and LLL, where did you learn about it? (more than one answer is possible)		**I'm not familiar**	**University**	**High School**	**Job**	**Internet**	**Colleagues**	**Conferences**
		143(28.3%)	43(48.1%)	48(9.5%)	60(11.9%)	152(30.1%)	57(11.3%)	58(11.5%)
58. Which one is your most preferred group learning activities	**Conferences**	**Workshops**	**Professional meetings**	**Online courses and blended learning activities**	**Reading journals**	**Seminars**	**Conducting a research**	**Non-standardized internet resources**
	91(18%)	132(26.1%)	64(12.7%)	115(22.8%)	32(6.3%)	22(4.4%)	24(4.8%)	24(4.8%)

As shown in table 7, the preferred learning style in many countries is clinical practice, and the direct observation of performance in practice was the preferred assessment tool in all countries except Turkey.

As a benefit of CPD, students in Turkey, Jordan, Malaysia and Yemen highly responded that CPD keeps them up to date [See table 7].

Participating in E-learning programs and professional websites or apps was the effective form of CPD activities in students' opinion in Jordan and Yemen, while attending to conferences, seminars and professional meetings was preferred from students in Nigeria and Cyprus [See table 7].

The students in all countries except Turkey have learned about CPD from the university.

As shown, students in Turkey, Malaysia, Nigeria and Yemen preferred to have CPD activities according to their needs as an extra curriculum, while students in all countries

except Cyprus preferred to have CPD activities according to their needs after graduation [See table 7].

The students in Turkey, Malaysia, Nigeria, Yemen and Cyprus preferred conferences as a group learning activity [table 7].

Table.7.

The higher perception response of participants to CPD in each country

Country	**Preferred learning style and assessment tool**	**Average**	**Frequency (%)**
Turkey	I prefer to learn with in clinical practice.	4.11	56(84.8%)
	I prefer feedback on annual performance review as assessment tool.	3.29	48(72.7%)
Indonesia	I prefer to learn from research.	3.59	70(52.6%)
	I prefer direct observation of performance in practice as an assessment tool.	3.41	67(51.9%)
Jordan	I prefer to learn with in clinical practice.	4.26	48(84.3%)
	I prefer direct observation of performance in practice as an assessment tool.	3.26	45(78.9%)
Malaysia	I prefer to learn with in clinical practice.	3.97	30(76.9%)
	I prefer direct observation of performance in practice as an assessment tool.	3.97	30(76.9%)
Nigeria	I prefer to learn with in clinical practice.	4.07	95(84%)
	I prefer direct observation of performance in practice as an assessment tool.	4.1	92(81.4%)
Yemen	I prefer to learn with in clinical practice.	3.82	22(64.8%)
	I prefer direct observation of performance in practice as an assessment tool.	4.03	27(79.2%)
Cyprus	I prefer to learn with in clinical practice.	3.78	44(65.6%)
	I prefer direct observation of performance in practice as an assessment tool.	3.39	40(59.7%)
Benefit of CPD			
Turkey	CPD Keep me up-to-date	4	54(81.8%)
Indonesia	Motivate me to apply the new-learned knowledge	3.6	72(55.8%)
Jordan	CPD Keep me up-to-date	4.02	44(77.2%)
Malaysia	CPD Keep me up-to-date	4.21	35(89.8%)
	Enhance and maintain my professional knowledge, skills, attitudes and values	4.21	37(94.8%)
Nigeria	Enhance and maintain my professional knowledge, skills, attitudes and values	4.5	107(94.7%)

Yemen	CPD Keep me up-to-date	4.06	26(76.4%)
Cyprus	Enhances status of the profession with the public	4.19	52(77.6%)
Effective forms of CPD activities			
Turkey	Conducting a research	4	53(80.3%)
Indonesia	Learning from non-standardized internet resources (YouTube, Wikipedia, etc.)	3.6	60(46.5%)
Jordan	Participating in E-learning programs and professional websites or apps. (Medscape, Up-to-date, Coursera, webinars, etc.)	4.02	45(79%)
Malaysia	Reading articles from Scientific Journals	4.08	35(89.7%)
	Attending Workshops	4.08	33(84.6%)
Nigeria	Attending to conferences, seminars and professional meetings.	4.21	100(88.5%)
Yemen	Participating in E-learning programs and professional websites or apps. (Medscape, Up-to-date, Coursera, webinars, etc.)	4.06	23(67.7%)
Cyprus	Attending to conferences, seminars and professional meetings.	3.4	33(49.3%)
Where did you learn about CPD			
Turkey	Internet		28 (42.4%)
Indonesia	University		65(50%)
Jordan	University		21(36.8%)
Malaysia	University		29(74.4%)
Nigeria	University		64 (56.6%)
Yemen	University		26(76.5%)
Cyprus	University		16(23.9%)
Having CPD activities			
Turkey	After graduation	According to my need	36 (54.5%)
	Extra curriculum	According to my need	31 (47.0%)
Indonesia	After graduation	According to my need	54(41.9%)
	Extra curriculum	Monthly	45(34.9%)
Jordan	After graduation	According to my need	24(42.1%)
	Extra curriculum	Monthly	26 (45.6%)
Malaysia	After graduation	According to my need	17(43.6%)
	Extra curriculum	According to my need	15(38.5%)
Nigeria	After graduation	According to my need	73 (64.6%)

	Extra curriculum	According to my need	50 (44.2%)
Yemen	After graduation	According to my need	15(44.1%)
	Extra curriculum	According to my need	15(44.1%)
Cyprus	After graduation	Monthly	26(38.8%)
	Extra curriculum	2 times per year	22(32.8%)
Most preferred group learning activities			
Turkey	Conferences		31(47%)
Indonesia	Professional meetings		45(34.9%)
Jordan	Professional meetings		26(45.6%)
Malaysia	Conferences		15(38.5%)
Nigeria	Conferences		50(44.2%)
Yemen	Conferences		15(44.1%)
Cyprus	Online courses and blended learning activities (Medscape, Up-to-date, Coursera, etc.)		22(32.8%)

Factors Affecting Motivation Towards CPD

More than half of the students agreed that one of the reasons for attending local/international CPD activity is because it enhances their career prospects 380(75.25%), the second reason is that CPD activities maintain their professional knowledge, skills, attitudes and values 379(75%), and keep them up-to-date 375(74.26%) [Table 8].

Regarding what motivate them toward CPD, more than half of the students agreed that attending CPD activities with colleagues motivates them to achieve my CPD goals. Whereas less than half of the students 209(41.39%) agreed that they feel confident that CPD is preparing them for practice development. 347(68.7%) agreed that during studying they do not have sufficient time to practice CPD. While 296(58.6%) agreed that the do not have sufficient resources to achieve my CPD goals. 203 (40.2%) from the students got motivated by the mentors and advisers. Further 281(55.7%) motivated by the challenges

(educational, social, practice related, etc.), while mainly the half of the students have sufficient enthusiasm to achieve my CPD goals [Table 8].

Table.8.

Factors Affecting Motivation Participants Towards CPD

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
For this reason I attend (may attend) local/international CPD activity					
A) Compliance with learning/ profession requirements	14(2.8%)	7(1.4%)	160(31.7%)	248(49.1%)	75(14.9%)
B) Skills improvement	7(1.4%)	10(2%)	116(23%)	254(50.3%)	118(23.4%)
C) Intrinsic interest	4(0.8%)	19(3.8%)	158(31.3%)	218(43.2%)	106(21%)
D) Career development	3(0.6%)	14(2.8%)	115(22.8%)	226(44.8%)	147(29.1%)
E) Improves my performance in my current role as student	9(1.8%)	19(3.8%)	148(29.3%)	229(45.3%)	100(19.8%)
F) Enhances status of the profession with other health practitioners	1(0.2%)	20(4%)	130(25.7%)	235(46.5%)	119(23.6%)
G) Enhances status of the profession with the public	7(1.4%)	15(3%)	129(25.5%)	240(47.5%)	114(22.6%)
H) Enhances my career prospects	10(2%)	8(1.6%)	107(21.2%)	262(51.9%)	118(23.4%)
I) Keep me up-to-date	9(1.8%)	9(1.8%)	112(22.2%)	234(46.3%)	141(27.9%)
J) Maintain my professional knowledge, skills, attitudes and values	9(1.8%)	9(1.8%)	108(21.4%)	242(47.9%)	137(27.1%)
I feel confident that CPD is preparing me for practice development.	10(2%)	17(3.4%)	148(29.3%)	232(45.9%)	98(19.4%)
During my studying I have sufficient time to practice CPD (set CPD goals, attend programs, self-assessment of needs, etc.).	45(8.9%)	76(15%)	226(44.8%)	132(26.1%)	26(5.1%)
I have sufficient resources (computer access, internet access, conferences cost) to achieve my CPD goals.	33(6.5%)	76(15%)	187(37%)	178(35.3%)	31(6.1%)
I have sufficiently support from my mentors and advisers.	31(6.1%)	56(11.1%)	215(42.6%)	166(32.9%)	37(7.3%)
I have sufficient enthusiasm to achieve my CPD goals.	8(1.6%)	45(8.9%)	193(38.2%)	209(41.4%)	50(9.9%)
Challenges (educational, social, practice related, etc.) motivate me to achieve my CPD goals.	16(3.2%)	32(6.3%)	176(34.9%)	229(45.3%)	52(10.3%)
Attending CPD activities with colleagues motivates me to achieve my CPD goals.	13(2.6%)	21(4.2%)	167(33.1%)	245(48.5%)	59(11.7%)

As shown in table 9 below, many factors were affecting students to participate in CPD activities, for example, in students' opinion in Turkey, Jordan, and Nigeria the reason for attending local/international CPD activity was because CPD keeps them up to date. While the Intrinsic interest had a lower response as a reason for attending local/international CPD activity in Turkey, Malaysia and Nigeria

Table.9.

The higher and lower motivation response of participants toward CPD in each country

Country		Reason for attending local/international CPD activity	Average
Turkey	High response	Keep me up-to-date	4.05
	Low response	Intrinsic interest	3.7
Indonesia	High response	1. Skills improvement 2. Maintain my professional knowledge, skills, attitudes and values	3.6
	Low response	Compliance with learning/ profession requirements	3.4
Jordan	High response	Keep me up-to-date	4.05
	Low response	Compliance with learning/ profession requirements	3.58
Malaysia	High response	Maintain my professional knowledge, skills, attitudes and values	4.15
	Low response	Intrinsic interest	3.79
Nigeria	High response	Keep me up-to-date	4.37
	Low response	Intrinsic interest	4.05
Yemen	High response	Career development	4.06
	Low response	Compliance with learning/ profession requirements	3.68
Cyprus	High response	Career development	4.03
	Low response	Improves my performance in my current role as student	3.33
	Motivation factors		
Turkey	High response	I feel confident that CPD is preparing me for practice development.	3.61
	Low response	I have sufficiently support from my mentors and advisers.	3.06
Indonesia	High response	Attending CPD activities with colleagues motivates me to achieve my CPD goals.	3.51
	Low response	During my studying I have sufficient time to practice CPD (set CPD goals, attend programs, self-assessment of needs, etc.).	3.41
Jordan	High response	I feel confident that CPD is preparing me for practice development.	3.91
	Low response	I have sufficiently support from my mentors and advisers.	3.14
Malaysia	High response	I feel confident that CPD is preparing me for practice development.	3.92
	Low response	During my studying I have sufficient time to practice CPD (set CPD goals, attend programs, self-assessment of needs, etc.).	2.82
Nigeria	High response	I feel confident that CPD is preparing me for practice development.	4.26
	Low response	During my studying I have sufficient time to practice CPD (set CPD goals, attend programs, self-assessment of needs, etc.).	2.67
Yemen	High response	Attending CPD activities with colleagues motivates me to achieve my CPD goals.	3.79
	Low response	I have sufficiently support from my mentors and advisers.	3.12
Cyprus	High response	I feel confident that CPD is preparing me for practice development.	3.66
	Low response	I have sufficient resources (computer access, internet access, conferences cost) to achieve my CPD goals.	2.58

The main motivation factor for students in all countries except Indonesia and Yemen was that students feel confident that CPD is preparing me for practice development. While having a sufficiently support from mentors and advisers had lower responses in many countries such as Turkey, Jordan and Yemen [table 9].

Perceived Barriers Towards CPD

The most of the pharmacists agreed that the cost of participation in some CPD practice 312(61.78%), were the most essential barriers to participation in CPD, accessibility to group learning activities (location/distance) 298(59%), lack of time 295(58.4%), and education restrictions 270(53.47%) were the most essential barriers to participation in CPD.

Table.10.

Participants' perceived barriers towards CPD

	According to me, the generally barriers to participate in CPD are:	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Perceived Barriers	A) Accessibility to group learning activities (location/distance), e.g. conferences in term of location or distance.	13(2.6%)	39(7.7%)	155(30.7%)	230(45.5%)	68(13.5%)
	B) Education restrictions (lack of learning activities, learning materials, etc.).	15(3%)	44(8.7%)	176(34.9%)	216(42.8%)	54(10.7%)
	C) Lack of time.	11(2.2%)	26(5.1%)	173(34.3%)	217(43%)	78(15.4%)
	D) Cost of participation to conferences, workshops or online courses, etc.	10(2%)	37(7.3%)	146(28.9%)	215(42.6%)	97(19.2%)
	E) Lack of relevant learning opportunities in my setting.	16(3.2%)	70(13.9%)	178(35.2%)	183(36.2%)	58(11.4%)
	F) I don't have enough idea and knowledge about CPD.	26(5.2%)	81(16%)	189(37.4%)	163(32.3%)	46(9.1%)
	G) I have a difficulty to self-reflect.	50(9.9%)	103(20.4%)	205(40.8%)	125(24.8%)	21(4.2%)
	H) I have difficulty with plan/goal generation and implementation.	30(5.9%)	126(25%)	175(34.7%)	145(28.7%)	29(5.7%)
	I) Uninteresting subjects or topics.	22(4.4%)	89(17.6%)	217(43%)	151(29.9%)	26(5.1%)
	J) Lack of quality learning activities.	26(5.1%)	62(12.3%)	180(35.6%)	198(39.2%)	39(7.7%)
	K) Family constraints (background, financial state).	46(9.1%)	89(17.6%)	177(35%)	158(31.3%)	35(6.9%)
	L) Subjects/ topics are too specialized.	17(3.4%)	90(17.8%)	213(42.2%)	159(31.5%)	26(5.1%)
	M) Low personal gain (learning) in relation to other activities.	34(6.7%)	91(18%)	221(43.8%)	132(26.1%)	27(5.3%)

Students in Jordan, Malaysia, and Yemen highly responded to "lack of time" as a barrier to participate in CPD, while the highly responded barrier for students in Turkey and Nigeria was the cost of participation. However, the low responses were for students having difficulties in reflecting themselves in Turkey, Jordan, Malaysia and Cyprus [table 11].

Table 11.

The higher and lower perceived barriers response of participants toward CPD in each country

Country	Barriers		average
Turkey	High response	Cost of participation to conferences, workshops or online courses, etc.	3.83
	Low response	I have a difficulty to self-reflect.	2.38
Indonesia	High response	Education restrictions (lack of learning activities, learning materials, etc.).	3.47
	Low response	Lack of quality learning activities.	3.29
Jordan	High response	Lack of time.	3,68
	Low response	I have a difficulty to self-reflect.	2,75
Malaysia	High response	Lack of time.	4,15
	Low response	I have a difficulty to self-reflect.	2,87
Nigeria	High response	Cost of participation to conferences, workshops or online courses, etc.	4
	Low response	Low personal gain (learning) in relation to other activities.	2,72
Yemen	High response	Lack of time.	3,79
	Low response	I have a difficulty to self-reflect.	3,09
Cyprus	High response	Accessibility to group learning activities (location/distance), e.g. conferences in term of location or distance.	3,66
	Low response	Family constraints (background, financial state).	2,39

Table 12

Compression of the demographic data and student's responses

Country	Demographic		Preferred learning style		Preferred assessment tool		Benefit of CPD		Effective forms of CPD activities		Reason for attending CPD activities		Motivation factor to achieve CPD goals		Barrier to participate in CPD activities	
Turkey	Gender	Male	Clinical practice	4.10	Direct observation of performance in practice	3.86	CPD Keep me up-to-date	3.76	Conducting a research	3.86	Keep me up-to-date	3.81	Attending CPD activities with colleagues	3.62	Lack of time	3.62
		Female	Clinical practice	4.11	Feedback on annual performance review	3.91	CPD Keep me up-to-date	4.11	Attending to conferences, seminars and professional meetings	4.07	Keep me up-to-date	4.16	CPD is preparing me for practice development	3.71	Cost of participation	3.98
	Age	20-25	Clinical practice	4.11	Feedback on annual performance review	3.88	CPD Keep me up-to-date	4.00	Conducting a research	4.00	Keep me up-to-date	4.05	CPD is preparing me for practice development	3.63	Cost of participation	3.83
		26-30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		>30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indonesia	Gender	Male	learn from research	3.53	knowledge assessment programs	3.63	Enhances status of the profession with the public	3.84	Participating in E-learning programs and professional websites or apps.	3.58	Enhances status of the profession with other health practitioners	3.84	Attending CPD activities with colleagues	3.53	Accessibility to group learning activities (location/distance),	3.58
		Female	learn from research	3.60	Direct observation of performance in practice	3.55	Enhances myself / public confidence	3.59	Learning from non-standardized internet resources	3.53	Maintain my Professional competence	3.59	Attending CPD activities with colleagues	3.51	Education restrictions	3.48
	Age	20-25	learn from research	3.60	Direct observation of performance in practice	3.56	Enhances myself / public confidence	3.62	Learning from non-standardized internet resources	3.58	Skills improvement	3.62	Attending CPD activities with colleagues	3.57	Education restrictions	3.47
		26-30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		>30	Clinical practice	3.67	Direct observation of performance in practice	3.67	Improves my performance as student or practitioner	3.67	Reading articles from Scientific Journals	3.67	Enhances my career prospects	3.67	All the factors motivate the same	3.33	Accessibility to group learning activities (location/distance)	3.67
Jordan	Gender	Male	Clinical practice	4.17	Direct observation of performance in practice	3.50	Improves my performance as student or practitioner	4.17	Reading articles from Scientific Journals	3.83	Skills improvement	4.00	CPD is preparing me for practice development	4.00	Lack of time	4.00
		Female	Clinical practice	4.27	Direct observation of performance in practice	4.18	CPD Keep me up-to-date	4.04	Participating in E-learning programs and professional websites or apps	4.06	Keep me up-to-date	4.10	CPD is preparing me for practice development	3.90	Cost of participation	3.67
	Age	20-25	Clinical practice	4.26	Direct observation of performance in practice	4.11	CPD Keep me up-to-date	4.02	Participating in E-learning programs and professional websites or apps	4.02	Keep me up-to-date	4.05	CPD is preparing me for practice development	3.91	Lack of time	3.67
		26-30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		>30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malaysia	Gender	Male	Clinical practice	3.82	Direct observation of performance in practice	3.73	Motivate me to apply the new-learned knowledge	4.18	Participating in E-learning programs and professional websites or apps	4.18	Enhances my career prospects	4.09	CPD is preparing me for practice development	3.91	Lack of time	4.18
		Female	Clinical practice	4.00	Direct observation of performance in practice	4.11	CPD Keep me up-to-date	4.29	Reading articles from Scientific Journals	4.14	Career development	4.18	CPD is preparing me for practice development	3.93	Cost of participation	4.14
	Age	20-25	Clinical practice	3.95	Direct observation of performance in practice	4.00	CPD Keep me up-to-date	4.21	Participating in E-learning programs and professional websites or apps	4.10	Maintain my Professional competence	4.15	CPD is preparing me for practice development	3.92	Cost of participation	4.13
		26-30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		>30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni	Gender	Male	Clinical practice	3.91	Direct observation of performance in practice	3.99	Enhance and maintain my professional competence	4.48	Attending to conferences, seminars and professional meetings	4.25	Maintain my Professional competence	4.39	CPD is preparing me for practice development	4.28	Cost of participation	4.00

		Female	Clinical practice	4.44	Direct observation of performance in practice	4.35	Enhance and maintain my professional competence	4.53	Attending Workshops	4.41	Keep me up-to-date	4.41	CPD is preparing me for practice development	4.21	Lack of time	4.03
	Age	20-25	Clinical practice	4.16	Direct observation of performance in practice	4.15	CPD Keep me up-to-date	4.51	Participating in E-learning programs and professional websites or apps	4.26	Career development	4.33	CPD is preparing me for practice development	4.16	Cost of participation	4.09
		26-30	Clinical practice	3.88	Direct observation of performance in practice	3.92	CPD Keep me up-to-date	4.60	Attending to conferences, seminars and professional meetings.	4.36	Enhances status of the profession with the public	4.60	CPD is preparing me for practice development	4.56	Lack of relevant learning opportunities in my setting	3.72
		>30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yemen	Gender	Male	learn from research	3.57	Direct observation of performance in practice	4.07	CPD Keep me up-to-date	3.93	Conducting a research	3.86	Enhances status of the profession with other health practitioners	4.21	I have sufficient time to practice CPD	4.07	Lack of time	3.57
		Female	Clinical practice	4.05	Direct observation of performance in practice	4.00	Enhance and maintain my professional competence	4.15	Attending Workshops	4.25	Maintain my Professional competence	4.15	CPD is preparing me for practice development	3.90	Lack of time	3.95
	Age	20-25	Clinical practice	3.88	Direct observation of performance in practice	4.09	CPD Keep me up-to-date	4.09	Participating in E-learning programs and professional websites or apps	4.13	Enhances status of the profession with other health practitioners	4.19	Attending CPD activities with colleagues	3.88	Lack of time	3.81
		26-30	learn from research	2.50	-	-	CPD Keep me up-to-date	3.50	-	-	Skills improvement	3.50	I have sufficient time to practice CPD	4.05	Education restrictions	3.50
		>30	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	Gender	Male	Clinical practice	3.83	Direct observation of performance in practice	3.37	Enhances status of the profession with the public	4.23	Learning from non-standardized internet resources	3.60	Skills improvement	4.30	CPD is preparing me for practice development	3.67	Accessibility to group learning activities (location/distance)	3.67
		Female	Clinical practice	3.73	Direct observation of performance in practice	3.41	Enhances status of the profession with the public	4.16	Attending to conferences, seminars and professional meetings	3.46	Maintain my Professional competence	3.95	CPD is preparing me for practice development	3.65	Accessibility to group learning activities (location/distance)	3.65
	Age	20-25	Clinical practice	3.82	Direct observation of performance in practice	3.35	Enhances status of the profession with the public	4.21	Attending to conferences, seminars and professional meetings	3.44	Career development	4.05	CPD is preparing me for practice development	3.68	Accessibility to group learning activities (location/distance)	3.61
		26-30	learn from research	3.57	Direct observation of performance in practice	3.43	Enhances status of the profession with the public	4.00	Attending to conferences, seminars and professional meetings	3.43	Maintain my Professional competence	4.29	CPD is preparing me for practice development	3.57	Accessibility to group learning activities (location/distance)	3.68
		>30	Clinical practice	3.57	knowledge assessment programs	3.33	Enhances status of the profession with the public	4.33	Reading Manufacturers Literature	3.33	Keep me up-to-date	4.33	Attending CPD activities with colleagues	4.33	Cost of participation	3.67

Preparing lifelong learners for the practice of pharmaceutical care in an ever-changing world

Students and participants' characteristics

103 fifth-year students were invited to complete a cross-sectional self-administered questionnaire, of which 67 (65%) responded. 40 (59.7%) students from among the respondents were randomly selected and invited to join the course, of which 27 (67.5%) students registered and completed the course while the other 13 (32.5%) were not able to register the course. Of those 13, 7 (53.8%) of them were transfer students who still had extra lessons to complete from the previous years, 4 (30.8%) of the students were international students who could not attend conferences and other activities in Cyprus and Turkey due to the travel and language barriers, and 2 (15.4%) were in their graduation semester.

Meanwhile, the remaining 40 (59.7%) students were invited to fill the SPLLL questionnaire at the beginning and the end of the academic year. Only 27 students responded to the questionnaire at the end of the study. The cumulative grade point average (cGPA) of students in the study group was 2.35±0.39; which showed no significant differences compared to the mean cGPA of the class (2.35±0.39 vs 2.45 ±0.36, $p>0.05$). The characteristic data of the intervention group students are summarized in Table 13.

Table 13
Students' Demographic Data (N= 27)

Variable	(%)
Gender	
Male (n=10)	37
Female (n=17)	63
Age	
20-25 (n=26)	96
26-30 (n=1)	3.7
> 30 (n=0)	0
Nationality	
Turkish (n=19)	70
Cypriot (n=4)	14.8
Nigerian (n=1)	3.7
Iraqi (n=3)	11
Future Plan	
Community Pharmacist (n=22)	18.5
Hospital Pharmacist (n=3)	11.1
Clinical Pharmacist (n=4)	14.8
Industrial Pharmacist (n=3)	11.1
Academic (Master, Ph.D.) (n=5)	18.5
Marketing (n=1)	3.7
CGPA	

3. 5 – 4 (n=1)	3.7
3 – 3.5 (n=1)	3.7
2.5 – 3 (n=5)	18.5
2 – 2.5 (n=16)	59.3
1.5 – 2 (n=4)	14.8
PILS*	
Assimilator (n=11)	40,7
Diverger (n=9)	33.3
Accommodator (n=4)	14.8
Converger (n=3)	11
Having CV (n=17)	63

*Pharmacist's Inventory of Learning Styles (PILS)

Students' assignments and portfolios

Out of the 27 students enrolled in the course, 8 (29.6%) students completed all the weekly assignments. Regarding the portfolio, 18 (66.7%) students submitted two fully completed CPD e-portfolios, and the other 9 (33.3%) students presented uncompleted portfolios. Table 14 shows the evaluation of the students in the course.

Table 14

Students Evaluation on Assignments, Portfolios and Total Grade (N= 27)

	Weekly assignments		Portfolio		Total grade in the course	
	N	(%)	N	(%)	N	(%)
Grade System in NEU						
3. 5 - 4	15	55.6	13	48.1	12	44.4
3 – 3.5	8	29.6	6	22.2	9	33.3
2.5 - 3	4	14.8	3	11.1	3	11.1
2 – 2.5	0	0	2	7.4	2	7.4
1.5 - 2	0	0	0	0	1	3.7
1-1.5	-	-	3	11.1	-	-
0-1	-	-	-	-	-	-

Students' Preparedness for LLL scale (pre-post self-assessment questionnaire)

No significant differences were found between the study group and other fifth year students in the students' self-assessment using the SPLLL scale compared to the

baseline, whether in total score (166.2 ±15.2 vs 161.62 ± 16.72; p>0.26) or the domains of the scale, except in the attitude scores that were higher in the study group. Following the implementation of the course, students' assessment scores were significantly higher overall and for all scale domains compared to the baseline assessment, as shown in Table 15. Additionally, compared to fifth year students who responded to the second SPLLL questionnaire at the end of the study, students who enrolled to the course were rated significantly higher in knowledge, skills, and practice associated with LLL compared to the control post intervention (p<0.02).

Table 15

Pre and post subscales for intervention group (N=27)

	Range	Pre-test score	Post-test score	Change in score (%)	*P* value
		M(SD)	M(SD)	M(SD)	
Subscales					
Knowledge	14 -70	40.85 (6.55)	60.8 (8.89)	29(16)	.000
SD skills	12 - 60	44.2 (6.53)	51 (6.04)	11(13)	.000
Attitude	13 - 65	49.44 (6)	54.4 (6.7)	8(13)	.000
Practice	12 - 60	31.67 (4.87)	46.56 (8.69)	25(14)	.000
Total	51 - 255	166.2 (15.2)	212.78 (27.1)	18(11)	.000

Students' evaluation of the CPD course (focus groups)

Theme 1 involved the course framework. Students in each group were asked if they agree that the course contents match with the aim of the course "to improve and develop pharmacy students' CE and professional skills to become lifelong learners''. All groups agreed that the aim and objectives of the course match the course content with an overall rating of 85%.

In terms of the course objectives achievement, the extent of achievement out of 100 varied among groups. FG1 and FG2 gave 95% and 85% respectively, the international students' FG3 rated 65% of course objectives to be achieved. According to some students, the bilingual nature of lectures was a barrier to achieving the course objectives as it caused them to lose focus. The second main barrier was the lack of student's time especially transfer students who had extra lessons from previous years thus less time to do assignments (Table 16).

In terms of course organization, the overall rating was 85%. There are many sub-codes under the course organization based on the groups' responses. Regarding the timing of the orientation lessons, student's views varied, yet the majority of the students preferred the early morning time for lectures and workshops (Table 16).

The second sub-code identified was the sufficiency of information provided about the course before students' registration. According to FG1 feedback, one of the major limitations in the course organization was insufficient information being provided about the course prior to their registration (Table 16).

The course delivery method was positively rated by the students in all groups. The students liked the interactive teaching method adopted as well as the workshops and in-class discussion led by the instructors. Students perceived the course delivery method as an "effective way to learn, share, apply and develop a skill". They were satisfied with the material content and references as well and they embraced the need for more interactive and group work learning in pharmacy education curriculum. Students also pleased that the course was individual-based and addressed their own learning needs (Table 16).

Regarding the course assessment and assignments activities, students rated the assignments as to achieve 90% of their educational objectives. The topics to practice weekly assignments or activities were selected by the students based on their educational need; this helped them to fill previous gaps in their learning. Students were highly pleased with the in-class discussion of homework and assignments, as well that the course assessment wasn't based on exams which motivated their learning more than courses with exams that they see stressful and not properly represent their actual learning (Table 16).

In FG3, students stated barriers that hinder them from doing assignments; these included the lack of enough time for carrying all self-directed assignments. Also, students in FG3 found it hard to determine activities to attend such as conferences, seminars, and workshops as activities are rare within university and in North Cyprus. Also, the registration fee for those available activities was a barrier for them as students to attend (Table 16).

Regarding course instructors, the overall evaluation of FG1, FG2, and FG3 for the instructors was 100%, 100%, and 90% respectively. Students evaluated the instructor to be a good communicator, used eye contact, helpful and understandable. The groups

agreed that the instructor was professional, knowledgeable, and well prepared, which facilitated achievement of course objectives (Table 16).

The students were asked whether they recommend this course in pharmacy education curricula or not, all answered by *"yes, we strongly recommend 100%"*. Students were also asked about their thoughts regarding the most appropriate semesters to start CPD course. Different opinions were brought out and a discussion took place between the students for a while. Even though all students reached a deal that this course is necessary for students before graduation, few students agreed that course should be delivered the last year proceeding graduation. Some students expressed their belief that this course in its current format is challenging for the fifth-year students during their final internship course as they are also writing graduation thesis. The big discussion was about the effectiveness of having this course in early years not only the last year, most students supported the idea that CPD should be taught earlier in curriculum (Table 16).

Regarding the duration of the course, FG3 agreed that two semesters are enough for such a course, while students of FG1 and FG2 recommended that this course should be delivered continually starting from the early years until graduation. Some students stressed on the importance of having it from the early years. Students when asked about the status of this course in curricula whether it keeps as an elective or become a compulsory course, all students recommended to deliver the course as a compulsory course for many reasons they stated (Table 16).

The second theme involved the acquired SDL and professional development skills. During the interview students reflected what they had gained from this course and the differences they noticed on their learning on individual bases. Students were pleased that they have their curriculum vitae (CV) and they can develop it by themselves. Students were also pleased that they practiced how to assess and address their learning needs and using online learning resources effectively (Table 16).

The third theme identified was related to portfolios. Students were asked about their thoughts about the portfolio they used and whether it was beneficial. FG1 rated portfolios 85% in terms of utility and content, while FG2 and FG3 evaluated portfolio to achieve only 55% in terms of easiness to use and applicability, although they found that using portfolios is beneficial. Regarding the format of the portfolio, most of the students liked the e-portfolio however, some of the students preferred the hard copy format perceiving it to be more beneficial than the online version (Table 16).

Theme four involved the recommendations and final statements. At the end of the focused interviews, we asked the students about their recommendations to improve the course. The first recommendation was about the time of the lesson within the day, not to be very early. Also, students recommended starting CPD course earlier in curricula. The second recommendation was about announcement, suggesting course directors to provide them information of potential learning activities, conferences, seminars or any learning activities offered in nearby places. Students also suggested providing students details of the course before their registration as they were surprised with the course content as it's delivered for the first time in their faculty. The third recommendation was to deliver the course in one language instead of being delivered bilingual using both English and Turkish languages (Table 16).

The fourth recommendation was related to the portfolio; students recommended shortening the portfolio and making it briefer. Other suggestions involved cooperating with other departments to provide more learning activities or opportunities including interprofessional activities (e.g. with the medicine faculty) within university campus with proper prior announcement. Students suggested finally to develop a faculty calendar that shows all learning activities in the region and within school (Table 16).

Table 16

Students' Evaluation of CPD Course (Focus Group Sessions)

Objectives and themes	Codes	Feedback	Related Statements
The course framework	Aim of the course	Students in each group were asked if they agree that the course contents match with the aim of the course "to improve and develop pharmacy students' CE and professional skills to become lifelong learners''. All groups agreed that the aim and objectives of the course match the course content with an overall rating of 85%.	*"This course was beneficial, at the beginning we learned how to assess ourselves and how to determine our weakness and strength, then how to select the appropriate seminars and other necessary activities to improve ourselves". FG1* *"At the beginning, I was worried because I heard that we need to attend seminars and it's hard for me as I am not from that type of person. But later on, I attended and it became beneficial". FG1*

	Course objectives achievement	In terms of the course objectives achievement, the extent of achievement out of 100 varied among groups. FG1 and FG2 gave 95% and 85% respectively, the international students' FG3 rated 65% of course objectives to be achieved. According to some students, the bilingual nature of lectures was a barrier to achieving the course objectives as it caused them to lose focus. The second main barrier was the lack of student's time especially transfer students who had extra lessons from previous years thus less time to do assignments.	*"Bilingual lectures are hard to follow"; "we didn't have time". Although many other students represent the achieving of the aim as "I got benefit and I know how to improve myself now". FG3*
	Course organization	The overall rating was 85%. There are many sub-codes under the course organization based on the groups' responses. a, Regarding the timing of the orientation lessons, student's views varied, yet the majority of the students preferred the early morning time for lectures and workshops. b, the second sub-code identified was the sufficiency of information provided about the course before students' registration. According to FG1 feedback, one of the major limitations in the course organization was insufficient information being provided about the course prior to their registration	*"lesson time and organization were good". FG3* *"The other mornings' lessons are not interactive, but this lesson needed interaction which was hard in early morning". FG1* *"We heard you need only to attend 2 conferences and you will finish. But later on, we took lectures every week Friday 09:00 am". FG1*

	Course delivery method "Individual-based learning needs"	The course delivery method was positively rated by the students in all groups. The students liked the interactive teaching method adopted as well as the workshops and in-class discussion led by the instructors. Students perceived the course delivery method as an "effective way to learn, share, apply and develop a skill". They were satisfied with the material content and references as well and they embraced the need for more interactive and group work learning in pharmacy education curriculum. Students also pleased that the course was individual-based and addressed their own learning needs.	*"at the beginning, there was theoretic lecture and explanation then we applied what we learned, it was good". FG1* *"There were many in-class activities, also slide presentation/material were attractive. The group and the friendly environment work were great; it was a good and beneficial course". FG1* *"Teaching with group work in the pharmacy, help in achieving your aims and everything. Now I am planning to open a community pharmacy, and I know how to develop myself. It was a realistic course, and it showed us that everyone learned something different than others". FG1* *"I felt myself a master student. I got used to sleeping in many lessons, but in this course, I did not". FG1* *"Everyone assessed his weakness and need individually, then accordingly we improved, it was like private lesson". FG2*
	Course assessment and assignments activities	Students rated the assignments as to achieve 90% of their educational objectives. The topics to practice weekly assignments or activities were selected by the students based on their educational need; this helped them to fill previous gaps in their learning. Students were highly pleased with the in-class discussion of homework and assignments, as well that the course assessment wasn't based on exams which motivated their learning more than	*"we liked assignments, we selected the topics that we want, searched and then discussed it in groups. It was beneficial". FG2* *"in other courses, we are doing our homework and waiting for the grade, but in CPD we discussed with both instructor and students". FG2* *"in the conferences and seminars, we were there to learn, we are not worried about the exam or what they will give in the exam". FG1* *"yes, it was hard to do the activities and fill it because we don't have time". FG2*

	courses with exams that they see stressful and not properly represent their actual learning. In FG3, students stated barriers that hinder them from doing assignments; these included the lack of enough time for carrying all self-directed assignments. Also, students in FG3 found it hard to determine activities to attend such as conferences, seminars, and workshops as activities are rare within university and in North Cyprus. Also, the registration fee for those available activities was a barrier for them as students to attend.	
Course instructors	The overall evaluation of FG1, FG2, and FG3 for the instructors was 100%, 100%, and 90% respectively. Students evaluated the instructor to be a good communicator, used eye contact, helpful and understandable. The groups agreed that the instructor was professional, knowledgeable, and well prepared, which facilitated achievement of course objectives.	*"we were able to contact him from anywhere in anytime and he was answering our queries". FG1* *"instructors inspired us when they shared with us their real stories, their aim and how to do a plan and how to change or improve ourselves. When I'm thinking, all these things I have gotten are from the course". FG1*
Whether they recommend this course in pharmacy education curricula or not	The students were asked whether they recommend this course in pharmacy education curricula or not, all answered by *"yes, we strongly recommend 100%".* Students were also asked about their thoughts regarding the most appropriate semesters to start CPD course. Different opinions were	*"yes, strongly recommended 100%". FG3* *"we think 5th is most suitable to assess and improve ourselves before graduation after almost finishing all courses". FG1* *"it was good for the 5th year students in the 1st semester, but it was not good*

	brought out and a discussion took place between the students for a while. Even though all students reached a deal that this course is necessary for students before graduation, few students agreed that course should be delivered the last year proceeding graduation. Some students expressed their belief that this course in its current format is challenging for the fifth-year students during their final internship course as they are also writing graduation thesis. The big discussion was about the effectiveness of having this course in early years not only the last year, most students supported the idea that CPD should be taught earlier in curriculum.	*for them in the 2nd semester in term of time". FG2* *"We wished it was on other years, 4th or 3rd year maybe we would do better and it's more logic, but not at the last year''. FG2* *"1st or 2nd year because when they started to attend conferences they are going to a trip not to learn, so I think it's good for them to learn from the beginning, there was a lot of free time in these years". FG1*
Duration of the course	FG3 agreed that two semesters are enough for such a course, while students of FG1 and FG2 recommended that this course should be delivered continually starting from the early years until graduation. Some students stressed on the importance of having it from the early years.	*"CV should be prepared from 4th year, but conferences and activities should be before. 4th year is late, in our opinion from the 3rd year". FG2*
Elective or compulsory course;	Students when asked about the status of this course in curricula whether it keeps as an elective or become a compulsory course, all students recommended to deliver the course as a compulsory course for many reasons they stated.	*"something that everybody should know, so should not be an elective course but compulsory". FG3*

Acquired SDL learning and professional development skills	During the session students reflected what they had gained from this course and the differences they noticed on their learning on individual bases. Students were pleased that they have their curriculum vitae (CV) and they can develop it by themselves. Students were also pleased that they practiced how to assess and address their learning needs and using online learning resources effectively.	*"before I was attending activities only for attending, but now first I need to find what I need then I will attend after having my plan. It was an opportunity for us to learn it".* FG2 *"the CV, we didn't know well before, but now everyone had his CV".* FG2 *"because most of my friends were asking me to teach them how to make their CV, I was proud and I was like okay I knew how to do it in class and I'm going to teach you".* FG3 *"I was able to learn what I'm weak in from the internet but before I did not use to".* FG2
Portfolio	Students were asked about their thoughts about the portfolio they used and whether it was beneficial. FG1 rated portfolios 85% in terms of utility and content, while FG2 and FG3 evaluated portfolio to achieve only 55% in terms of easiness to use and applicability, although they found that using portfolios is beneficial. Regarding the format of the portfolio, most of the students liked the e-portfolio however, some of the students preferred the hard copy format perceiving it to be more beneficial than the online version.	*"we felt boring a lot of repetition in the questions, some questions sound as being repeated and lots of details. It's better to be briefer".* FG2

Recommendations	At the end of the focused group sessions, we asked the students about their recommendations to improve the course. a, The first recommendation was about the time of the lesson within the day, not to be very early. Also, students recommended starting CPD course earlier in curricula. b, the second recommendation was about announcement, suggesting course directors to provide them information of potential learning activities, conferences, seminars or any learning activities offered in nearby places. c, the third recommendation was to deliver the course in one language instead of being delivered bilingual using both English and Turkish languages. d, the fourth recommendation was related to the portfolio; students recommended shortening the portfolio and making it briefer. e, Other suggestions involved cooperating with other departments to provide more learning activities or opportunities including interprofessional activities (e.g. with the medicine faculty) within university campus with proper prior announcement. Students suggested finally to develop a faculty calendar that shows all learning activities in the region and within school.	*"better time fitting our schedule".* FG1 *"we need to know this information before the last year".* FG2 *"I really felt bad, even I couldn't communicate with my friends".* FG3 *"we think pharmacy faculty should host many activities as conferences".* FG1 *"I would add more activity inside the class, and announce more conferences for the students to attend".* FG3 *"a calendar of the planned conferences in Turkey and Cyprus would be helpful".* FG2 *"the first semester was good but the second one was hard especially for the students training in Cyprus".* FG1

Final statements	*"Now I have a background about the things we need to do in my future and how to be a lifelong learner".* FG3 *"I feel proud and confident, that was nice because you made us know these key and important things we should have, so it was nice and you gave us an opportunity as well".* FG3 *"I submitted my CV which I prepared in class to a pharmacy in Germany and I got the acceptance".* FG3 *"We are happy that we are requested for feedback, it did not happen before, we feel now that our evaluation and thinking is important and that we are valued as students".* FG1

Discussion

Within the different learning modes, educators identified varying advantages and disadvantages associated with each mode of learning. In the current course, a wide range of teaching methods were adopted involving exposition, discussion, enquiry, activity and collaboration (Entwistle & Hounsell, 1975). (Sturrock & Lennie, 2009)

A small group learning method was used to enable enhanced knowledge exchange and discussion among students and with their instructors. Small group learning is well established in the literature as an effective setting for learning (Springer et al., 1999) and a method preferred by pharmacy students suitable for enhancing LLL skills (Entwistle & Hounsell, 1975).

The CPD cycle derived from Kolb's learning cycle(Britain, 2006) was adopted as a main framework for students' assignments and portfolios. In the literature, students' completion of a minimum of two CPD cycles was reported as an effective utilization of the mode in leadership and professional development (Patterson et al., 2013). In the current study, a minimum of three completed CPD cycles was required to assure students' competence in utilizing the CPD cycle.

Other features possibly contributing to program outcomes include a lengthy course duration in contrast to short courses or workshops shown by many educators to be less effective and having an effect that may last a week or a few hours (Desimone et al.,

2002) (Garet et al., 2001). Active learning methods known to improve the problem-solving and critical thinking skills of students along reflective portfolios that provide evidence of professional development and the achievement of the desired competencies were all adopted during the course (T. S. Tofade et al., 2010) (Tsingos et al., 2014) (Schneider et al., 2016). Both subjective and objective assessment methods were utilized. based on Donald Kirkpatrick's developed model to evaluate the overall effectiveness of training programs (Mesquita et al., 2015).

Several students stated that they found the SMART learning objective exercise to be useful and beneficial. One of the students stated that "I guess I learned especially from the SMART objective and personal SWOT analysis, I even used it in my scientific presentation course. I was able to talk about how to be specific and to be smart in planning everything that you do in pharmacy, achieving your aims and everything". This perception toward the SMART learning objective was similarly reported in US schools (T. S. Tofade et al., 2010).

CV development is an important ability closely linked to CPD, as also emphasized by Dyke JE et al.'s study. Students were suggested to design and update their CVs during the course so to grasp how CPD may contribute toward improving their CVs fast with time (Unni et al., 2019).

Students found portfolio development to be one of the more challenging activities in the course. A student said that "it was stressful and needed concentration, but it's beneficial". A similar study reported that 40% of the surveyed students found the portfolio to be a challenge while 54% of them reported that it was effective in supporting their learning (Schneider et al., 2016). The use of online training modules and electronic portfolio submissions made the CPD program much more convenient. A student commented that "using online portfolio and incorporating technology was pleasant and unexpected".

CPD is not learning for the sake of learning; it helps to move students toward their career goals (Janke & Tofade, 2015). As a student expressed in the focus group session, that now they can improve themselves in all fields: "now we also might improve ourselves not only in a community pharmacy, we could work also in other sectors". CPD allows students to individualize aspects of their education(Unni et al., 2019) since being a self-directed lifelong learner requires skills for determining individual learning needs. The students reflected on how they liked that the course was based on individual learning needs: "in university things are not based on our weakness

or need we are never asked this. But in CPD the activities were based on our needs and then we improved that was good" as a student in FG1 emphasized.

O'Brocta et al suggested that incorporating the CPD process early in the 1st year will familiarize the students with the CPD method and permit them to become more proficient in applying it. Continuing the CPD process during advanced experiential years mimics its integration into actual pharmacy practice (O'Brocta et al., 2012). Students in the current study supported these opinions, where most of them preferred to have orientation in the early years while the practice of CPD should be required in the advanced years of the program: "there are basic information we could have even from first classes, such as why CPD, why we need it, and some online courses, while maybe some advance things as portfolios and conferences are suitable for 5th-year students, but at least basics can be delivered earlier" as a student commented.

Improving the knowledge of students' learning preferences, behaviors, and strategies can benefit and guide CPD. Applying Austin's Pharmacist's Inventory of Learning Styles tool can contribute to defining, describing, and measuring learning styles among pharmacists (Austin, 2004a). The dominant learning style of the students in current study was assimilator (40.7%), followed by diverger (33.3%), accommodator (14.8%) and converger (11%). A similar distribution was reported in a study done at the University of Malaysia involving pharmacy students in which the dominant learning style of the students was assimilator (Elkalmi et al., 2015).

A few limitations of the current study are mentioned. To start with, the small sample size for the students limits the generalization of the study findings over the study population. Additionally, the response rate of the 5th year students used as a control was not high enough, although the current responses are considered acceptable for generating hypotheses (Gay et al., 1976). Further, the subjective nature of the self-evaluation, as in the case of SPLLL scale used in this study, may be considered as a limitation, although an objective assessment of assignments and portfolios by instructors was done. Additionally, it is important to mention that pre-post assessments could be subject to recall bias, though the duration between the two assessments in the current study was relatively long (9 months). Also the multifaceted nature of CPD processes utilized in different countries may arise challenges in replicating this course, yet the process adopted in this course is universal and promoted by the world FIP (Federation, 2002).

Despite the presence of these limitations, the findings of this study contribute to the prior literature on LLL and CPD in pharmacy education. To date, no researcher reported the successful implementation of an LLL targeted program utilizing the CPD model in programs outside the US. Dyke JE et al reported poor outcomes of the program at a UK based university. In addition, in an Australian university, although an improvement of students' skills was noticed, poor student acceptance of the TLR was reported [19, 18] contrary to the current study findings. The introduction of the CPD simulation in an advance year coupled with experiential practices is contrary to Dyke JE et al's course, which was administered to first year students, and this may explain the success of the program in North Cyprus. Additionally, the small group learning strategy adopted and the lower complexity of the program introduced in the current study may justify higher student satisfaction and acceptance compared to the TLR study. Other features supporting the validity of the findings of the current study include the mixed method design adopted to generate both quantitative and qualitative data. In regard to the course assessment, both objective and subjective approaches were used to evaluate student performance and all components of the program. The course features were mainly supported by grounded theories and evidence. This study is the first to report an attempt to implement longitudinal courses targeting and developing CPD and LLL in resource-limited settings or developing countries.

CHAPTER V

Conclusion and Recommendations

Summary of the Main Results

The implementation of the CPD simulation course resulted in higher mean scores on the SPLLL scale compared to their classmates and their self-rating before implementation. The course provided students with opportunities to practice and develop skills in self-assessment and awareness, SMART planning, evaluation and proper documentation of their learning, which are all desirable for LLL. Most students performed very well (78%) in their assignments and got high scores on their portfolio evaluation. Students perceived that the course matched its aim and that they had achieved most of the course objectives. Students perceived themselves currently more committed and oriented to LLL and professionalism.

CPD and LLL in pharmacy education is challenging, inconsistent, and usually not assessed or even required in many pharmacy programs in Cyprus, Turkey and across the globe. In this study, grounded theoretical features were employed within a longitudinal CPD course to enable students to develop themselves as independent lifelong learners beyond graduation.

Implications for Practice

The implementation of a CPD simulation course improved students' knowledge, skills, attitudes and practice of CPD, evaluated using a self-assessment scale (SPLLL). The course provided students with opportunities to practice and develop skills which are desirable for LLL. Students well perceived the setting of the course and recommend to introduce the course earlier as a mandatory course in their curriculum. Future work should focus on the early introduction of similar programs and its impact on future pharmacists' post registration and in practice.

Recommendations for Further Research

Future research must assess the implementation and impact of similar programs using a larger sample of students, especially for the early introduction of the program in the second and third years of M.pharm programs coupled with introductory pharmacy practice experiences. Practicing CPD within experiential courses is important since it simulates the required setting of pharmacy practice as the students graduate. Assessing

the impact of similar programs following student's graduation and registration as practitioners would be useful too.

The implementation of a CPD course may also provide more flexible opportunities or a window for learning newly evolving concepts or practices not addressed in pharmacy curriculum since curricula needs years to be revised and updated in many countries. Students in the current study have reported that their self-development in both areas were not sufficiently addressed during their studies and in new areas previously unfamiliar to them (e.g., sports medicine and vaccinations). Thus, assessing such an impact of a CPD course in contrast to other courses provided within curricula may further enrich the current literature.

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APPENDICES

Appendix A.

Students' Attitude toward CPD and Preparedness to Become Lifelong Learners Questionnaire (SPLLL):

This project is carried by the Near East University, clinical pharmacy department. The aim is to develop and validate a survey tool to assess pharmacy students' preparedness and attitude toward continuing professional development in Turkey and Northern Cyprus

SECTION 1: Demographic Data of Respondents

Demographics	**Gender**	Female ( )			Male ( )		
	Age						
	Nationality						
	Year of Study	1st	2nd	3rd	4th	5th	6th
	University				Previous University (*only for transferred students)		
					Mention:……..		
	Your Future Plan	Community Pharmacist	Hospital Pharmacist	Clinical Pharmacist	Industrial Pharmacist	Academic (MSc and Ph.D.)	Marketing
		Others: (Please mention)……					
	Do you have your own Curriculum Vitae (CV)	Yes ( )			No ( )		

SECTION 2: Knowledge and Experience of CPD Activities

		Not familiar at all	Slightly familiar	Somewhat Familiar	Moderately familiar	Strongly familiar
knowledge	1. I'm familiar with the term of **Life Long Learning (LLL)**.					
	2. I'm familiar with the terms **Continuing Professional Development (CPD)** and/or **Continuing Professional Education (CPE).**					
	3. I'm familiar with different types of **CPD activities**.					
	4. I'm familiar with the **elements of the CPD Cycle.** (Reflect-Plan-Learn- Evaluate – Record and Review - Apply)					
	5. I'm familiar with **personal reflection** for ex. (SWOT analysis) (Strength – Weakness – Opportunities – Threats)					
	6. I'm familiar with **SMART objectives plan**. (Specific – Measurable – Achievable – Relevant- Timed)					
	7. I'm familiar with the existence of different **learning styles**. (Divergers– Assimilators– Convergers– Accommodators – etc…)					
	8. To my knowledge the following are forms of CPD activities:					
	A. Reading articles from Scientific **Journals**					
	B. Attending **Workshops**					
	C. Attending to **conferences, seminars and professional meetings.**					
	D. Reading Manufacturers **Literature (**ex. brochure, leaflets, etc.)					
	E. Participating in **E-learning programs and professional websites or apps**. (Medscape, Up-to-date, Coursera, webinars, etc.)					
	F. **Learning from non-standardized internet** resources (YouTube, Wikipedia, etc.)					
	G. **Conducting a research**					

		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
SDLLL skills	9. I'm able to identify/ assess my personal learning needs.					
	10. I'm able to identify/ assess my professional learning needs.					
	11. I'm able to plan **my learning and professional goals.**					
	12. I'm able to evaluate **the impact** or **outcomes** of **my learning**.					
	13. I'm able to keep **up-to-date** in my field using the different learning resources.					
	14. I have the **ability** to **demonstrate effective action** to meet my own learning needs.					
	15. I have good **management skills** ex. manage the time, solve learning problem, and prioritize my work.					
	16. I'm able to **assess** my own **strengths and weaknesses** in the process of learning.					
	17. I'm able to **relate** what I learnt **into the practice**.					
	18. I'm able to **assess** and **monitor** my **learning progress**.					
	19. I'm able to **use information technology** effectively.					
	20. I can **develop** my own **Curriculum Vitae (CV).**					

		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
SDLLL Attitudes	21. I'm responsible for my **own learning.**					
	22. My inner drive directs me towards further **development and improvement** in my learning.					
	23. I find learning in **group is beneficial**.					
	24. I **enjoy** the process of learning.					
	25. I **believe** in the benefits of being a **lifelong learner**.					
	26. I feel that to be a lifelong learner **increases** the possibility of **employment** and/or success.					
	27. I **enjoy exploring** information related to my profession and my learning needs.					
	28. It's **rewarding** by itself to search for answer to a question.					
	29. I **believe** that I would fall behind if I stopped learning about new developments in healthcare profession.					
	30. I feel both success and failure **inspire** me to further learning.					
	31. I like to **evaluate** what I do.					
	32. I prefer to learn with **self-directed learning** activities.					
	33. I prefer to learn with a **structured education and training** ex. Curriculum courses.					

	34. I have participated in the following activities:	Never	Seldom	Sometimes	Usually	Always
Practice	A. Reading articles from Scientific **Journals**					
	B. Attending **Workshops**					
	C. Attending to **conferences, seminars and professional meetings.**					
	D. Reading Manufacturers **Literature (**ex. brochure, leaflets, etc.)					
	E. Participating in **E-learning programs and professional websites or apps**. (Medscape, Up-to-date, Coursera, webinars, etc.)					
	F. **Learning from non-standardized internet** resources (YouTube, Wikipedia, etc.)					
	G. **Conducting a research**					
	35. During the past year, I did a **reflection** to select my own learning needs.					
	36. During the past year, I did my **own personal evaluation** of my strength and weakness in term of learning or professional development.					
	37. During the past year, I have **set** my own **plan** for learning or professional development.					
	38. During the past year, I have **evaluated** my learning outcomes **after applying** my plan.					
	39. During the past year, I **documented** my **learning needs and learning activities** (e.g., in a portfolio, a diary, an annual activity report, CV)					

SECTION 3: The Perceptions of Students to Continuing Professional Development (CPD)

Perceptions

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
40. I prefer to learn with in **clinical practice**.					
41. I prefer to learn from **research** .					
42. I prefer **direct observation** of performance in practice as an assessment tool.					
43. I prefer knowledge **assessment programs** (Exams, HomeWorks, quizzes etc.) to assess my learning.					
44. I prefer **feedback** on annual performance review as assessment tool.					
45. In my opinion the following are benefits of CPD:					
A) **Improves** my **performance** as student or practitioner					
B) **Enhances** status of the profession **with other health practitioners**					
C) **Enhances** status of the profession **with the public**					
D) **Enhances** my **career prospects**					
E) CPD Keep me **up-to-date**					
F) **Enhance** and **maintain** my professional knowledge, skills, attitudes and values					
G) **Motivate** me to **apply** the new-learned knowledge					
H) **Enhances** myself / public **confidence**					
46. In my opinion the following are the effective forms of CPD activities:					
A) Reading articles from Scientific **Journals**					
B) Attending **Workshops**					
C) Attending to **conferences, seminars and professional meetings.**					
D) Reading Manufacturers **Literature (**ex. brochure, leaflets, etc.)					
E) Participating in **E-learning programs and professional websites or apps**. (Medscape, Up-to-date, Coursera, webinars, etc.)					
F) Learning from non-standardized internet resources (YouTube, Wikipedia, etc.)					
G) Conducting a research					

47. If familiar with any of CPD or/and LLL , where did you learn about it? (more than one answer is possible)	
A) I'm not familiar ( )	B) University. ( )
C) High School. ( )	D) Job (Training, work , or internship) ( )
E) Internet. ( )	F) Colleagues. ( )
G) Conferences ( )	**Other**: (Please mention)…….

	According to my need	Twice per month	Monthly	2 times per year	Once per year
48. How often would you prefer to have CPD activities **after your graduation**? (Check one answer √)					
49. How often you prefer to have CPD activities as an **extra curriculum**? (Check one answer √)					

SECTION 4: Factors Affecting Motivation Towards Continuing Professional Development (CPD)

Motivating Factors

50. For this reasons I attend (may attend) local/international CPD activity	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
K) **Compliance** with learning/ profession requirements					
L) Skills **improvement**					
M) **Intrinsic interest**					
N) Career development					
O) Improves my performance in my current role as **student**					
P) Enhances status of the profession with other **health practitioners**					
Q) Enhances status of the profession with the **public**					
R) Enhances my **career** prospects					
S) Keep me **up-to-date**					
T) Maintain my professional knowledge, skills, attitudes and values					

	51. I feel confident that CPD is **preparing** me for practice development.					
	52. During my studying I have **sufficient time** to practice CPD (set CPD goals, attend programs, self-assessment of needs, etc.).					
	53. I have sufficient **resources** (computer access, internet access, conferences cost) to achieve my CPD goals.					
	54. I have sufficiently support from my mentors and advisers.					
	55. I have sufficient enthusiasm to **achieve** my CPD goals.					
	56. Challenges (educational, social, practice related, etc.) **motivate** me to achieve my CPD goals.					
	57. Attending CPD activities with colleagues **motivates** me to achieve my CPD goals.					

58. Which one is your most preferred group learning activities (Check one answer √)

A) Conferences ( )	B) Workshops ( )
C) Professional meetings ( )	D) Online courses and blended learning activities (Medscape, Up-to-date, Coursera, etc.) ( )
E) Reading journals ( )	F) Seminars ( )
G) Conducting a research ( )	H) Non-standardized internet resources (YouTube, Wikipedia, etc.) ( )

SECTION 5: Barriers to Participation in Continuous Professional Development (CPD)

	59. According to me, the generally barriers to participate in CPD are:	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
Perceived Barriers	A) **Accessibility** to group learning activities (location/distance), e.g. conferences in term of location or distance.					
	B) Education **restrictions** (lack of learning activities, learning materials, etc.).					
	C) **Lack** of **time**.					
	D) **Cost** of participation to conferences, workshops or online courses, etc.					
	E) **Lack** of relevant learning **opportunities** in my setting.					
	F) I don't have **enough idea** and knowledge about CPD.					
	G) I have a **difficulty** to self-reflect.					
	H) I have **difficulty** with plan/goal generation and implementation.					
	I) **Uninteresting** subjects or topics.					
	J) Lack of **quality** learning activities.					
	K) Family **constraints** (background, financial state).					
	L) Subjects/ topics are too **specialized**.					
	M) **Low** personal **gain** (learning) in relation to other activities.					

Appendix B.

Student's Portfolio

Self-Directed Learning Continuing Professional Development

Applying CPD cycle to develop your own portfolio

* Required

1. Email address *

2.

1. seçenek

Before starting READ this description carefully, Please.

During your practice semester (spring semester) 2018-2019, you are required to:
1. Apply the CPD cycle at least two times for different planned goals for example: I need to learn about electrolytes supplements in pediatric by attending online course in Futurelearn MOOCs platform from 1.04.2019 – 25.04.2019.
2. Every cycle should include at least two learning activities ex.conferences, workshops, online program, etc .
3. The deadline for submitting the first CPD cycle portfolio is on 30.04.2019 and the deadline for submitting the second CP cycle portfolio is on 30.05.2019.
4. For each planned CPD cycle fill the complete online portfolio in this form except section 7.
5. If you had unplanned activity please fill only section 1, 7, 8.

Note:" the unplanned activity will give you bonus marks however it will not be included within the required two CPD cycles.
Note: Attending one conference will equal two activities.

Student information

3. Name and Surname : *

4. Student number

5. CPD cycle title

The name of the topic you had learned.

_____

6. CPD cycle number

- [ ] First Cycle
- [ ] Second Cycle
- [ ] Third Cycle

Other: [ ] _____

1. Reflection

Thinking about things and the process of identifying individualized learning needs and opportunities for improvement.

7. What you want to do?

Think about your situation

_____

_____

_____

_____

_____

8. So What? Why you want it ?

Think about what it means to you and others.

_____

_____

_____

_____

_____

9. What you will learn from this?

Think about hat you ant to do about it.

10. How will you use this? (Personal benefit)

11. How will you use this? (Society benefit)

2. Plan

Planning is the process of developing a learning plan designed to address the needs or opportunities identified through reflection.

S=Specific, M=Measurable, A=Achievable, R=Relevant, T=Timed

12. Your goal: SMART Learning Objective

13. Planned Activities and resources to be used

ex. Online course, Workshop, etc.

14. Dates: Goal started date

15. Dates: Goal Finished date

16. Dates: Actual finish date

3. Learning Action	The learning plan should be implemented ex. Attending a conference, online course, worksho etc..

Your first activity information

17. Name of the learning activity?

18. Date of starting the activity

19. Date of finishing the activity

20. Location of the activity.

In case it's a conference or workshop or any activity that are not online.

21. The CPD activity provider.

22. The CPD activity platform sources ?

In case of online learning ex. futurelearn, courser, edX...

23. Website link of the activity.

24. Do you get a certificate?

If you got any type the certificate please send it to the email " dskhamis@gmail.com"

- ◯ Yes, if yes please upload the certificate
- ◯ No

25.

- ◯ Option 1

26. Number of the activity hours

_____

27. Type of activity ?

	Standardized	Non Standardized
Scientific	◯	◯
Non-scientific	◯	◯

28. Describe the activity you took part in that enabled you to something new.

Be specific about the activity you describe. If you read an article, give it as a reference.

_____

_____

_____

_____

_____

29. Describe what you actually learnt from this activity.
Try to describe this in terms of the skills, knowledge, attitudes and/or behaviors you have developed.

Your second activity information

30. Name of the learning activity?

31. Date of starting the activity

32. Date of finishing the activity

33. Location of the activity

34. Do you get a certificate?

If you got any type the certificate please send it to the email " dskhamis@gmail.com"

- Yes
- No

35. Number of the activity hours

36. Type of activity ?

	Standardized	Non Standardized
Scientific		
Non-scientific		

37. The CPD activity provider

38. Describe the activity you took part in that enabled you to something new.
Be specific about the activity you describe. If you read an article, give it as a reference.

39. Describe what you actually learnt from this activity.
Try to describe this in terms of the skills, knowledge, attitudes and/or behaviors you have developed.

4. Evaluation	Evaluation is linked to a new reflection stage, ensuring that the CPD process includes continuous refinement and is ongoing.

40. To which extent did you learn what you wanted to?

- [ ] Fully
- [ ] Partly
- [ ] Not at all

41. If you ticked fully or partly, give an example of how you applied or how you intend to apply what you have learnt to your practice?

42. If you ticked fully or partly, what have been or what will be the benefits to your practice/ patients and, the public?

43. If your learning had not been fully achieved, what has not been achieved?

44. If your learning had not been fully achieved, why has it not been achieved?

45. What are you going to do next?

- ◯ Nothing, I've learnt enough for what I need
- ◯ Review to see if I can Complete what I want to learn within this CPD cycle
- ◯ Start a new CPD cycle and complete what I want to learn.

5- Unplanned learning	Learning that starting at action. (fill it if you have unplanned learning only). For example you are in your practice in hospital and there will be a lecture about antibiotics, and your preceptor asked you tc attend.

46. Date of learning undertaken

47. What did you do to learn something new?

48. What have you learnt?

49. Give an example of how you have applied or how intend to apply what you have learnt to your practic
Evaluation the learning activity

50. What have been or what will be the benefits to your practice/ Patients and/or the public?

51. What are you going to do next?

- [ ] Nothing, I've learnt enough for what I need
- [ ] Start a new CPD cycle at reflection about what I still need to learn.

6. Apply

APPLY learned knowledge, skills, attitudes, and values into practice

52. Identify which of the outcomes apply to this learning activity

53. How will you change the practice based on this learning? (Set specific goals)

54. What additional information will you pursue? When and how will you pursue it?

Appendix C.

Preparing lifelong learners for delivering pharmaceutical care in an ever-changing world: a study of pharmacy students

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Preparing lifelong learners for delivering pharmaceutical care in an ever-changing world: a study of pharmacy students

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Abstract

Background: Continuing professional development (CPD) continues to gain acceptance as a model for health care professionals to engage in lifelong learning (LLL). Many pharmacy schools have not adopted yet specific programs targeting the development of LLL skills, though LLL is widely accepted as an essential competence. This paper examines the effectiveness and utility of a longitudinal CPD training program.

Methods: A CPD simulation course was introduced to a cohort of fifth year students in Northern Cyprus in the 2018–2019 academic year. The program was delivered as an interactive orientation course in one semester; meanwhile, in the second semester, the students applied the CPD cycle and completed their portfolios during their final experiential practice. A mixed-methods approach was used to evaluate the outcomes of the intervention using students' preparedness for lifelong learning (SPLLL) self-administered questionnaire delivered pre-post program, focus group sessions for students to reflect on the course experience, and instructors' evaluations of portfolios.

Results: Following the implementation of the course, students' assessment scores were significantly higher overall and for all scale domains, including "knowledge, skills, attitude and practice", compared to the baseline assessment. Additionally, compared to fifth year students who responded to the second SPLLL questionnaire, the intervention group students' assessment was significantly higher in knowledge, skills, and practice. The qualitative analysis reported high student satisfaction and achievement of the course objectives. Nineteen of the students scored high on their portfolios.

Conclusion: The CPD simulation course provided students with opportunities to practice and develop self-assessment and self-management skills that are all desirable for lifelong learning and prepared them for CPD.

Keywords: Continuing professional development, Lifelong learner, Self-directed learning, Pharmacy education, Competence, global health challenges

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Donald Kirkpatrick developed a four-level learning evaluation hierarchy that's commonly used to evaluate the effectiveness of educational programs. This model identifies the following four levels as evidence for learning that is reaction, learning, behavior, and results [21]. Outcomes utilized in the above mentioned CPD programs fall within the first three levels of the Kirkpatrick hierarchy.

The multifaceted nature of CPD as an advanced model compared to traditional approaches to continuing education (CE) necessitate that pharmacists must receive training and guidance in order to develop the required competence and implement the CPD process in their practices [22, 23].

Other countries around the world currently have a variety of systems in place for CE in pharmacy [22], spanning from traditional CE requirements to the full implementation of a more extensive CPD approach [22]. Conversely, the situation was no or poor programs are adopted to develop LLL and CPD associated skills is also present in schools. This may further explain why implementing CPD programs is challenging outside the states [19].

In Turkey and Northern Cyprus, CPD programs are not objectively structured or a compulsory requirement for recertification in pharmacy practice. As a result, pharmacists that are preceptors for new graduates are unfamiliar with the CPD process since most of them were not exposed to it [24, 25].

There are over 40 pharmacy faculties in Turkey and Northern Cyprus, with local accreditations awarded by the Turkish Higher Education Counsel for professional 5 year programs [26]. Out of these, Near East University (NEU) is certified by the ACPE [27]. To acquire this certification, the faculty of pharmacy reviewed its curriculum in order to meet the required standards. CPD and LLL were among the competencies targeted to be achieved by students enrolled in the M.pharm program that the faculty offers.

Objective

To our knowledge, there are no studies that have evaluated the implementation of a CPD simulation model in developing countries. Many universities worldwide are currently acquiring an ACPE certification, which requires addressing CPD in curricula and educational program outcomes. This study fills this research gap by examining the effectiveness and utility of a longitudinal CPD training program introduced to fifth year M.pharm students in North Cyprus.

The hypothesis of this research is that a CPD simulation program is providing opportunities to practice and develop skills in self-assessment and awareness, SMART planning and monitoring, and documentation of one's own learning plans and activities, all of which are desirable for LLL.

Methods

A CPD simulation course was introduced to a cohort of fifth year pharmacy students at NEU in Northern Cyprus through the 2018–2019 academic year. The course objective was to improve students' competence in CPD and LLL through an interactive orientation course in the first semester followed by a self-directed learning (SDL) assignment required from each student during their final experiential practice.

A mixed-method design was adopted to evaluate the implementation outcomes. Students' preparedness for CPD and LLL was assessed using students' preparedness for lifelong learning (SPLLL) self-administered questionnaire, which was developed and validated by the research group, and delivered pre-post program. Students' feedback was also evaluated using an exploratory qualitative approach from a focus group with the students at the end of the study period. Each student was required to reflect on and document his learning using a student portfolio, which was also evaluated by the instructors (see Fig. 1).

Design and implementation

The course was launched as a longitudinal elective course named the CPD course. The course instructors received prior training in CPD and LLL skills development conducted by experts from the ACPE and a pharmacy education consulting company.

In the students' orientation course, the course was delivered as interactive didactic lectures and workshops. The students were provided a 2-h lecture with training on a weekly basis (see Fig. 2).

In the second part of the CPD course, students were requested to determine and address their learning needs based on individual self-assessment during their final experiential internship. Variety of activities and resources including online courses, regional conferences, seminars, workshops, learning materials as videos, textbooks, brochures etc. were all accepted as activities that may help achieve one's own learning targets. A virtual meeting was held to answer student's questions and provide guidance to students regarding how to fulfil the required assignments. The students were also provided written guidance on the course description and the answers for expected questions.

Assessment and evaluation

Weekly activities and assignments

During the orientation course of the first semester, weekly assignment activities were required from the students individually or in groups as a formative assessment to achieve course objectives. Following each assignment or homework task, instructors discussed the assignments with students in class to elaborate on their performance and reinforce positive responses. Weekly assignments had scores that represented 5–10% of the total mark of the course.

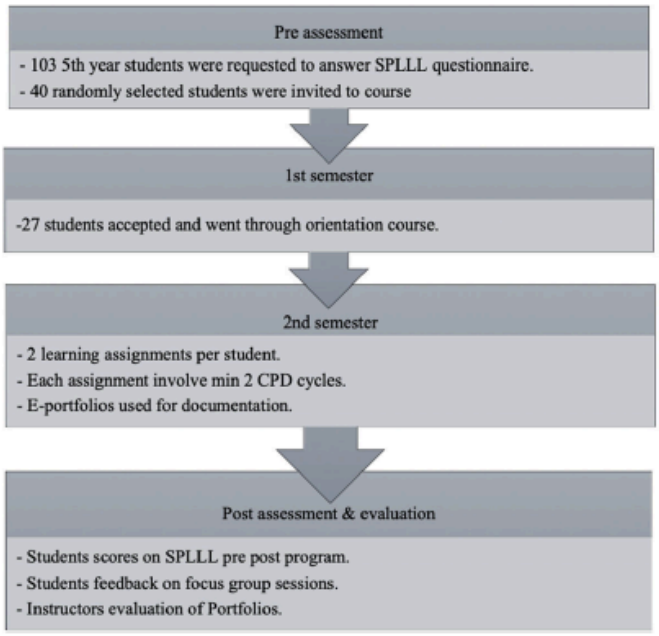

Fig. 1 Study Design & Flow

Student's portfolio

Students were required to complete 3 CPD cycles throughout the year: the first cycle was in the first semester, and a minimum of two cycles per student were required in the second semester. For each cycle, each student was required to use a minimum of two different learning activities which were then documented in student's e-portfolio (see Fig. 3). A validated rubric was used to evaluate the portfolios by the research team. The rubric involved the following items (reflection, SMART objective plan, learning activity, evaluation, application). Each CPD cycle assignment in the second semester formed 20% of the total percentage of the course (total of 40%).

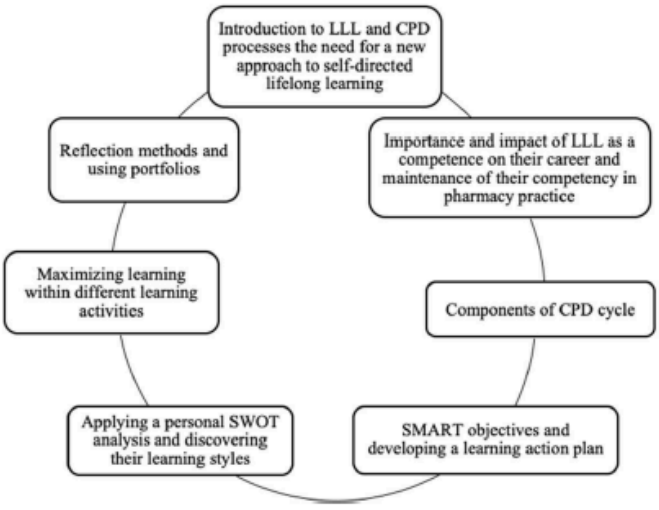

Fig. 2 CPD Course content

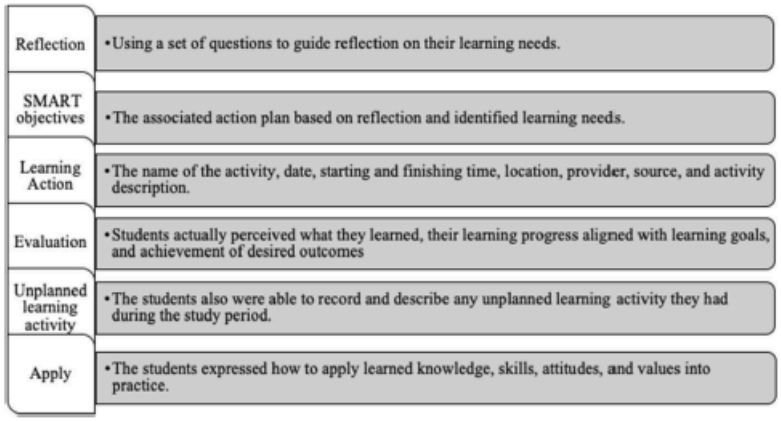

Fig. 3 Portfolio sections

Students' preparedness for LLL (pre-post self-assessment questionnaire)

A comprehensive literature review was conducted to develop the CPD course content and an assessment tool. The developed questionnaire tool consisted of 5 sections and 59 questions recorded on a five-point Likert-type scale. The tool was developed and validated using the Delphi method followed by pilot testing and exploratory factor analysis using a sample of 521 students in the last year of pharmacy programs from 7 countries. The self-administered questionnaire tool was used to assess changes in students' self-evaluation of their preparedness for CPD and LLL. The questionnaire involved awareness associated with CPD and LLL, SDL skills and attitudes, the practice of CPD cycle components and activities in the past months, motivation factors and perceived barriers to participation in CPD activities.

Students' evaluation of the CPD course (focus groups)

Qualitative feedback was obtained from students using the focus group (FG) approach at the end of the study (see Table 1). The focus group sessions were done in the same format to allow for potential comparisons between groups during the analysis. The facilitators of the sessions were trained in acquiring responses and handling qualitative sessions. An independent observer that took detailed notes and observed the group dynamics was present during the sessions. Each focus group lasted from 30 to 40 min and all sessions were tape-recorded and subsequently transcribed verbatim by an independent experienced transcriber and translator.

Data analysis

The statistical analysis of the quantitative data was conducted using SPSS version 23.0 (IBM Corporation, US). Categorical variables, such as gender, age, nationality, and future plans, were presented in frequencies and percentages. In addition, the continuous variables of the pretest and posttest scores of the CPD simulated program course were expressed as the mean ± SD, and the unpaired t-test was used to compare the control and the intervention groups. The paired t-test was applied to determine the mean and median significant differences between the pretest and posttest scores of the intervention group. *P*-value < 0.05 was considered statistically significant.

Thematic analysis was employed to inductively and deductively derive themes from qualitative data using the NVivo 12.6 software (QSR Intl Pty Ltd.; Doncaster, Australia).

Results

Students and participants' characteristics

103 fifth-year students were invited to complete a cross-sectional self-administered questionnaire, of which 67 (65%) responded. 40 (59.7%) students from among the respondents were randomly selected and invited to join the course, of which 27 (67.5%) students registered and completed the course while the other 13 (32.5%) were not able to register for the course. Of those 13, seven (53.8%) of them were transfer students who still had extra lessons to complete from the previous years, four (30.8%) of the students were international students who could not attend conferences and other activities in Cyprus and Turkey due to the travel and language barriers, and two (15.4%) were in their graduation semester.

Meanwhile, the remaining 40 (59.7%) students were invited to fill the SPLLL questionnaire at the beginning and the end of the academic year. Only 27 students responded to the questionnaire at the end of the study.

Table 1 Qualitative Feedback from Student Evaluation of CPD Course (Focus Group Session)

Questioning route	A semi-structured questioning route was developed by the authors and used for three developed groups.
Session questions	1. The course settings (aim, achievement, content, organization, time, assessment methods and instructors), 2. Their experience of skills development (e.g. SMART objectives plan, personal SWOT analysis, learning styles, Curriculum Vitae (CV) development and personal portfolios), 3. Benefits and strengths of the course in enhancing student learning, 4. Barriers and weakness of the course that hindered students' learning, 5. Experiences students enjoyed most in the course and their suggestions for improving the courses in the future.
Student focus groups (FGs)	Three homogeneous student FGs were arranged based on the preferred medium of communication; a. FG1 and FG2 were conducted in Turkish language b. FG3 in English language.
Informed consent	a. Before the commencement of the focus group, students were asked if they would be willing to participate in an approximately 30-min session to provide feedback on the CPD course. b. All participants were informed that their session will be recorded and assured that their lack of participation in the session would have no effect on their grade.
Qualitative data manipulation	The first stage involved transcription carried by the principal researcher and reviewed by 2nd author for accuracy and annotated for nonverbal content.
	Following transcription, the script was translated into English using backward and forward translation method done by the principal researcher and the 2nd author (bilingual English, Turkish); then by a professional translator (bilingual with Turkish as a first language)
	Following translation, the third stage involved content analysis of the data sets to develop categories and themes.
Inductive thematic analysis	Inductive thematic analysis of the transcripts was undertaken based on six steps [28] a, becoming familiar with the data; b, generating initial codes; c, searching for themes; d, reviewing themes; e, defining and naming themes f, finally producing the report. - The principal researcher reviewed all the transcripts several times, coded the data and extracted the main emerging themes. - A second investigator reviewed the transcripts and the key themes thus strengthening the validation of study results. - All authors discussed the themes, codes, similarities, and differences until agreement was reached on the key themes and subthemes.

The cumulative grade point average (cGPA) of students in the study group was 2.35 ± 0.39; which showed no significant differences compared to the mean cGPA of the class (2.35 ± 0.39 vs 2.45 ± 0.36, $p > 0.05$). The characteristic data of the intervention group students are summarized in Table 2.

Students' assignments and portfolios

Out of the 27 students enrolled in the course, 8 (29.6%) students completed all the weekly assignments. Regarding the portfolio, 18 (66.7%) students submitted two fully completed CPD e-portfolios, and the other 9 (33.3%) students presented uncompleted portfolios. Table 3 shows the evaluation of the students in the course.

Students' preparedness for LLL scale (pre-post self-assessment questionnaire)

No significant differences were found between the study group and other fifth year students in the students' self-assessment using the SPLLL scale compared to the baseline, whether in total score (166.2 ± 15.2 vs 161.62 ± 16.72; $p > 0.26$) or the domains of the scale, except in the attitude scores that were higher in the study group. Following the implementation of the course, students' assessment scores were significantly higher overall and for all scale domains compared to the baseline assessment, as shown in Table 4. Additionally, compared to fifth year students who responded to the second SPLLL questionnaire at the end of the study, students who enrolled to the course were rated significantly higher in knowledge, skills, and practice associated with LLL compared to the control post intervention ($p < 0.02$).

Students' evaluation of the CPD course (focus groups)

Three FGs were formed. 21 out of 27 students participated (FG1 $n = 9$, FG2 $n = 8$, and FG3 $n = 3$) in the focus group sessions conducted at the end of the academic year while 6 students declined to participate due to scheduling conflicts or other work priorities.

Four themes emerged from the latent content analysis: 1) the course framework and factors influencing the course effectiveness, 2) SDL and professional development skills, 3) the portfolio and 4) recommendations. Following the transcription and coding of all focus group sessions, out of the codes identified, four themes emerged. Each of these themes and their codes is presented with participant quotations included to illustrate them (Table 5).

Table 2 Students' Demographic Data (*N* = 27)

Variable	(%)
Gender	
Male (*n* = 10)	37
Female (*n* = 17)	63
Age	
20–25 (*n* = 26)	96
26–30 (n = 1)	3.7
> 30 (*n* = 0)	0
Nationality	
Turkish (*n* = 19)	70
Cypriot (*n* = 4)	14.8
Nigerian (n = 1)	3.7
Iraqi (n = 3)	11
Future Plan	
Community Pharmacist (*n* = 22)	18.5
Hospital Pharmacist (n = 3)	11.1
Clinical Pharmacist (n = 4)	14.8
Industrial Pharmacist (n = 3)	11.1
Academic (Master, Ph.D.) (n = 5)	18.5
Marketing (n = 1)	3.7
CGPA	
3.5–4 (*n* = 1)	3.7
3–3.5 (n = 1)	3.7
2.5–3 (*n* = 5)	18.5
2–2.5 (*n* = 16)	59.3
1.5–2 (n = 4)	14.8
PILS[a]	
Assimilator (*n* = 11)	40,7
Diverger (n = 9)	33.3
Accommodator (n = 4)	14.8
Converger (n = 3)	11
Having CV (n = 17)	63

[a]Pharmacist's Inventory of Learning Styles (PILS)

Table 3 Students Evaluation on Assignments, Portfolios and Total Grade (N = 27)

	Weekly assignments		Portfolio		Total grade in the course	
	N	(%)	N	(%)	N	(%)
Grade System in NEU						
3.5–4	15	55.6	13	48.1	12	44.4
3–3.5	8	29.6	6	22.2	9	33.3
2.5–3	4	14.8	3	11.1	3	11.1
2–2.5	0	0	2	7.4	2	7.4
1.5–2	0	0	0	0	1	3.7
1–1.5	–	–	3	11.1	–	–
0–1	–	–	–	–	–	–

Discussion

The implementation of the CPD simulation course resulted in higher mean scores on the SPLLL scale compared to their classmates and their self-rating before implementation. The course provided students with opportunities to practice and develop skills in self-assessment and awareness, SMART planning, evaluation and proper documentation of their learning, which are all desirable for LLL. Most students performed very well (78%) in their assignments and got high scores on their portfolio evaluation. Students perceived that the course matched its aim and that they had achieved most of the course objectives. Students perceived themselves currently more committed and oriented to LLL and professionalism.

CPD and LLL in pharmacy education is challenging, inconsistent, and usually not assessed or even required in many pharmacy programs in Cyprus, Turkey and across the globe. In this study, grounded theoretical features were employed within a longitudinal CPD course to enable students to develop themselves as independent lifelong learners beyond graduation.

Within the different learning modes, educators identified varying advantages and disadvantages associated with each mode of learning. In the current course, a wide range of teaching methods were adopted involving exposition, discussion, enquiry, activity and collaboration [29].

A small group learning method was used to enable enhanced knowledge exchange and discussion among students and with their instructors. Small group learning is well established in the literature as an effective setting for learning [29] and a method preferred by pharmacy students suitable for enhancing LLL skills [29, 30].

The CPD cycle derived from Kolb's learning cycle [17] was adopted as a main framework for students' assignments and portfolios. In the literature, students' completion of a minimum of two CPD cycles was reported as an effective utilization of the mode in leadership and professional development [31]. In the current study, a minimum of three completed CPD cycles was required to assure students' competence in utilizing the CPD cycle.

Other features possibly contributing to program outcomes include a lengthy course duration in contrast to short courses or workshops shown by many educators to be less effective and having an effect that may last a week or a few hours [32, 33]. Active learning methods known to improve the problem-solving and critical thinking skills of students along reflective portfolios that provide evidence of professional development and the achievement of the desired competencies were all adopted during the course [12, 34, 35]. Both subjective and objective assessment methods were utilized. Based on Donald Kirkpatrick's developed model to evaluate the overall effectiveness of training programs [21].

Table 4 Pre and post subscales for intervention group (N = 27)

	Range	Pre-test score M (SD)	Post-test score M (SD)	Change in score (%) M (SD)	*P* value
Subscales					
Knowledge	14–70	40.85 (6.55)	60.8 (8.89)	29 (16)	.000
SD skills	12–60	44.2 (6.53)	51 (6.04)	11 (13)	.000
Attitude	13–65	49.44 (6)	54.4 (6.7)	8 (13)	.000
Practice	12–60	31.67 (4.87)	46.56 (8.69)	25 (14)	.000
Total	51–255	166.2 (15.2)	212.78 (27.1)	18 (11)	.000

Several students stated that they found the SMART learning objective exercise to be useful and beneficial. One of the students stated that "*I guess I learned especially from the SMART objective and personal SWOT analysis, I even used it in my scientific presentation course. I was able to talk about how to be specific and to be smart in planning everything that you do in pharmacy, achieving your aims and everything*". This perception toward the SMART learning objective was similarly reported in US schools [14].

CV development is an important ability closely linked to CPD, as also emphasized by Dyke JE et al.'s study. Students were suggested to design and update their CVs during the course so to grasp how CPD may contribute toward improving their CVs fast with time [18].

Students found portfolio development to be one of the more challenging activities in the course. A student said that "*it was stressful and needed concentration, but it's beneficial*". A similar study reported that 40% of the surveyed students found the portfolio to be a challenge while 54% of them reported that it was effective in supporting their learning [36]. The use of online training modules and electronic portfolio submissions made the CPD program much more convenient. A student commented that "*using online portfolio and incorporating technology was pleasant and unexpected*".

CPD is not learning for the sake of learning; it helps to move students toward their career goals [9]. As a student expressed in the focus group session, that now they can improve themselves in all fields: "*now we also might improve ourselves not only in a community pharmacy, we could work also in other sectors*". CPD allows students to individualize aspects of their education [18] since being a self-directed lifelong learner requires skills for determining individual learning needs. The students reflected on how they liked that the course was based on individual learning needs: "*in university things are not based on our weakness or need we are never asked this. But in CPD the activities were based on our needs and then we improved that was good*" as a student in FG1 emphasized.

O'Brocta et al. suggested that incorporating the CPD process early in the 1st year will familiarize the students with the CPD method and permit them to become more proficient in applying it. Continuing the CPD process during advanced experiential years mimics its integration into actual pharmacy practice [37]. Students in the current study supported these opinions, where most of them preferred to have orientation in the early years while the practice of CPD should be required in the advanced years of the program: "*there are basic information we could have even from first classes, such as why CPD, why we need it, and some online courses, while maybe some advance things as portfolios and conferences are suitable for 5th-year students, but at least basics can be delivered earlier*" as a student commented.

Improving the knowledge of students' learning preferences, behaviors, and strategies can benefit and guide CPD. Applying Austin's Pharmacist's Inventory of Learning Styles tool can contribute to defining, describing, and measuring learning styles among pharmacists [38]. The dominant learning style of the students in current study was assimilator (40.7%), followed by diverger (33.3%), accommodator (14.8%) and converger (11%). A similar distribution was reported in a study done at the University of Malaysia involving pharmacy students in which the dominant learning style of the students was assimilator [39].

A few limitations of the current study are mentioned. To start with, the small sample size for the students limits the generalization of the study findings over the study population. Additionally, the response rate of the 5th year students used as a control was not high enough, although the current responses are considered acceptable for generating hypotheses [40]. Further, the subjective nature of the self-evaluation, as in the case of SPLLL scale used in this study, may be considered as a limitation, although an objective assessment of assignments and portfolios by instructors was done. Additionally, it is important to mention that pre-post assessments could be subject to recall bias, though the duration between the two assessments in the current study was relatively

Table 5 Students' Evaluation of CPD Course (Focus Group Sessions)

Objectives and themes	Codes	Feedback	Related Statements
The course framework	Aim of the course	Students in each group were asked if they agree that the course contents match with the aim of the course "to improve and develop pharmacy students' CE and professional skills to become lifelong learners". All groups agreed that the aim and objectives of the course match the course content with an overall rating of 85%.	*"This course was beneficial, at the beginning we learned how to assess ourselves and how to determine our weakness and strength, then how to select the appropriate seminars and other necessary activities to improve ourselves". FG1* *"At the beginning, I was worried because I heard that we need to attend seminars and it's hard for me as I am not from that type of person. But later on, I attended and it became beneficial". FG1*
	Course objectives achievement	In terms of the course objectives achievement, the extent of achievement out of 100 varied among groups. FG1 and FG2 gave 95 and 85% respectively, the international students' FG3 rated 65% of course objectives to be achieved. According to some students, the bilingual nature of lectures was a barrier to achieving the course objectives as it caused them to lose focus. The second main barrier was the lack of student's time especially transfer students who had extra lessons from previous years thus less time to do assignments.	*"Bilingual lectures are hard to follow"; "we didn't have time". Although many other students represent the achieving of the aim as "I got benefit and I know how to improve myself now". FG3*
	Course organization	The overall rating was 85%. There are many sub-codes under the course organization based on the groups' responses. a. Regarding the timing of the orientation lessons, student's views varied, yet the majority of the students preferred the early morning time for lectures and workshops. b. The second sub-code identified was the sufficiency of information provided about the course before students' registration. According to FG1 feedback, one of the major limitations in the course organization was insufficient information being provided about the course prior to their registration	*"lesson time and organization were good". FG3* *"The other mornings' lessons are not interactive, but this lesson needed interaction which was hard in early morning". FG1* *"We heard you need only to attend 2 conferences and you will finish. But later on, we took lectures every week Friday 09:00 am". FG1*
	Course delivery method "Individual-based learning needs"	The course delivery method was positively rated by the students in all groups. The students liked the interactive teaching method adopted as well as the workshops and in-class discussion led by the instructors. Students perceived the course delivery method as an "effective way to learn, share, apply and develop a skill". They were satisfied with the material content and references as well and they embraced the need for more interactive and group work learning in pharmacy education curriculum. Students also pleased that the course was individual-based and addressed their own learning needs.	*"at the beginning, there was theoretic lecture and explanation then we applied what we learned, it was good". FG1* *"There were many in-class activities, also slide presentation/material were attractive. The group and the friendly environment work were great; it was a good and beneficial course". FG1* *"Teaching with group work in the pharmacy, help in achieving your aims and everything. Now I am planning to open a community pharmacy, and I know how to develop myself. It was a realistic course, and it showed us that everyone learned something different than others". FG1* *"I felt myself a master student. I got used to sleeping in many lessons, but in this course, I did not". FG1* *"Everyone assessed his weakness and need individually, then accordingly we improved, it was like private lesson". FG2*
	Course assessment and assignments activities	Students rated the assignments as to achieve 90% of their educational objectives. The topics to practice weekly assignments or activities were selected by the students based on their educational need; this helped them to fill previous gaps in their learning. Students were highly pleased with the in-class discussion of homework and assignments, as well that the course assessment wasn't based on exams which motivated their learning more	*"we liked assignments, we selected the topics that we want, searched and then discussed it in groups. It was beneficial". FG2* *"in other courses, we are doing our homework and waiting for the grade, but in CPD we discussed with both instructor and students". FG2* *"in the conferences and seminars, we were there to learn, we are not worried about the exam or what they will give in the exam". FG1* *"yes, it was hard to do the activities and fill it*

Table 5 Students' Evaluation of CPD Course (Focus Group Sessions) *(Continued)*

Objectives and themes	Codes	Feedback	Related Statements
		than courses with exams that they see stressful and not properly represent their actual learning. In FG3, students stated barriers that hinder them from doing assignments; these included the lack of enough time for carrying all self-directed assignments. Also, students in FG3 found it hard to determine activities to attend such as conferences, seminars, and workshops as activities are rare within university and in North Cyprus. Also, the registration fee for those available activities was a barrier for them as students to attend.	*because we don't have time". FG2*
	Course instructors	The overall evaluation of FG1, FG2, and FG3 for the instructors was 100, 100, and 90% respectively. Students evaluated the instructor to be a good communicator, used eye contact, helpful and understandable. The groups agreed that the instructor was professional, knowledgeable, and well prepared, which facilitated achievement of course objectives.	*"we were able to contact him from anywhere in anytime and he was answering our queries". FG1* *"instructors inspired us when they shared with us their real stories, their aim and how to do a plan and how to change or improve ourselves. When I'm thinking, all these things I have gotten are from the course". FG1*
	Whether they recommend this course in pharmacy education curricula or not	The students were asked whether they recommend this course in pharmacy education curricula or not, all answered by *"yes, we strongly recommend 100%"*. Students were also asked about their thoughts regarding the most appropriate semesters to start CPD course. Different opinions were brought out and a discussion took place between the students for a while. Even though all students reached a deal that this course is necessary for students before graduation, few students agreed that course should be delivered the last year proceeding graduation. Some students expressed their belief that this course in its current format is challenging for the fifth year students during their final internship course as they are also writing graduation thesis. The big discussion was about the effectiveness of having this course in early years not only the last year, most students supported the idea that CPD should be taught earlier in curriculum.	*"yes, strongly recommended 100%". FG3* *"we think 5th is most suitable to assess and improve ourselves before graduation after almost finishing all courses". FG1* *"it was good for the 5th year students in the 1st semester, but it was not good for them in the 2nd semester in term of time". FG2* *"we wished it was on other years, 4th or 3rd year maybe we would do better and it's more logic, but not at the last year". FG2* *"1st or 2nd year because when they started to attend conferences they are going to a trip not to learn, so I think it's good for them to learn from the beginning, there was a lot of free time in these years". FG1*
	Duration of the course	FG3 agreed that two semesters are enough for such a course, while students of FG1 and FG2 recommended that this course should be delivered continually starting from the early years until graduation. Some students stressed on the importance of having it from the early years.	*"CV should be prepared from 4th year, but conferences and activities should be before. 4th year is late, in our opinion from the 3rd year". FG2*
	Elective or compulsory course;	Students when asked about the status of this course in curricula whether it keeps as an elective or become a compulsory course, all students recommended to deliver the course as a compulsory course for many reasons they stated.	*"something that everybody should know, so should not be an elective course but compulsory". FG3*
Acquired SDL learning and professional development skills		During the session students reflected what they had gained from this course and the differences they noticed on their learning on individual bases. Students were pleased that they have their curriculum vitae (CV) and they can develop it by themselves. Students were also pleased that they practiced how to assess and address their learning needs and using online learning resources effectively.	*"before I was attending activities only for attending, but now first I need to find what I need then I will attend after having my plan. It was an opportunity for us to learn it". FG2* *"the CV, we didn't know well before, but now everyone had his CV". FG2* *"because most of my friends were asking me to teach them how to make their CV, I was proud and I was like okay I knew how to do it in class and I'm going to teach you". FG3* *"I was able to learn what I'm weak in from the*

Table 5 Students' Evaluation of CPD Course (Focus Group Sessions) *(Continued)*

Objectives and themes	Codes	Feedback	Related Statements
			internet but before I did not use to". FG2
Portfolio		Students were asked about their thoughts about the portfolio they used and whether it was beneficial. FG1 rated portfolios 85% in terms of utility and content, while FG2 and FG3 evaluated portfolio to achieve only 55% in terms of easiness to use and applicability, although they found that using portfolios is beneficial. Regarding the format of the portfolio, most of the students liked the e-portfolio however, some of the students preferred the hard copy format perceiving it to be more beneficial than the on-line version.	*"we felt boring a lot of repetition in the questions, some questions sound as being repeated and lots of details. It's better to be briefer".* FG2
Recommendations		At the end of the focused group sessions, we asked the students about their recommendations to improve the course. a. The first recommendation was about the time of the lesson within the day, not to be very early. Also, students recommended starting CPD course earlier in curricula. b. The second recommendation was about announcement, suggesting course directors to provide them information of potential learning activities, conferences, seminars or any learning activities offered in nearby places. c. The third recommendation was to deliver the course in one language instead of being delivered bilingual using both English and Turkish languages. d. The fourth recommendation was related to the portfolio; students recommended shortening the portfolio and making it briefer. e. Other suggestions involved cooperating with other departments to provide more learning activities or opportunities including interprofessional activities (e.g. with the medicine faculty) within university campus with proper prior announcement. Students suggested finally to develop a faculty calendar that shows all learning activities in the region and within school.	*"better time fitting our schedule".* FG1 *"we need to know this information before the last year".* FG2 *"I really felt bad, even I couldn't communicate with my friends".* FG3 *"we think pharmacy faculty should host many activities as conferences".* FG1 *"I would add more activity inside the class, and announce more conferences for the students to attend".* FG3 *"a calendar of the planned conferences in Turkey and Cyprus would be helpful".* FG2 *"the first semester was good but the second one was hard especially for the students training in Cyprus".* FG1

long (9 months). Also the multifaceted nature of CPD processes utilized in different countries may arise challenges in replicating this course, yet the process adopted in this course is universal and promoted by the world FIP [10].

Despite the presence of these limitations, the findings of this study contribute to the prior literature on LLL and CPD in pharmacy education. To date, no researcher reported the successful implementation of an LLL targeted program utilizing the CPD model in programs outside the US. Dyke JE et al. reported poor outcomes of the program at a UK based university. In addition, in an Australian university, although an improvement of students' skills was noticed, poor student acceptance of the TLR was reported [18, 19] contrary to the current study findings. The introduction of the CPD simulation in an advance year coupled with experiential practices is contrary to Dyke JE et al's course, which was administered to first year students, and this may explain the success of the program in North Cyprus. Additionally, the small group learning strategy adopted and the lower complexity of the program introduced in the current study may justify higher student satisfaction and acceptance compared to the TLR study. Other features supporting the validity of the findings of the current study include the mixed method design adopted to generate both quantitative and qualitative data. In regard to the course assessment, both objective and subjective approaches were used to evaluate student performance and all components of the program. The course features were mainly supported by grounded theories and evidence. This study is the first to report an attempt to implement longitudinal courses targeting and developing CPD and LLL in resource-limited settings or developing countries.

Future research must assess the implementation and impact of similar programs using a larger sample of students, especially for the early introduction of the program

in the second and third years of M.pharm programs coupled with introductory pharmacy practice experiences. Practicing CPD within experiential courses is important since it simulates the required setting of pharmacy practice as the students graduate. Assessing the impact of similar programs following student's graduation and registration as practitioners would be useful too.

The implementation of a CPD course may also provide more flexible opportunities or a window for learning newly evolving concepts or practices not addressed in pharmacy curriculum since curricula needs years to be revised and updated in many countries. Students in the current study have reported that their self-development in both areas were not sufficiently addressed during their studies and in new areas previously unfamiliar to them (e.g., sports medicine and vaccinations). Thus, assessing such an impact of a CPD course in contrast to other courses provided within curricula may further enrich the current literature.

Conclusion

The implementation of a CPD simulation course improved students' knowledge, skills, attitudes and practice of CPD, evaluated using a self-assessment scale (SPLLL). The course provided students with opportunities to practice and develop skills which are desirable for LLL. Students well perceived the setting of the course and recommend to introduce the course earlier as a mandatory course in their curriculum. Future work should focus on the early introduction of similar programs and its impact on future pharmacists' post registration and in practice.

Abbreviations

CPD: Continuing professional development; LLL: Lifelong learning; SPLLL: Students' preparedness for lifelong learning; FIP: International Pharmaceutical Federation; PharmD: Doctor of pharmacy; US: United State; ACPE: Accreditation Council for Pharmacy Education; RUCOP: Roseman University College of Pharmacy; TLR: Traffic light report; M.pharm: Master of pharmacy; CE: Continuing education; NEU: East University; SDL: Self-directed learning; FG: Focus group; CV: Curriculum Vitae; CGPA: Cumulative grade point average; PILS: Pharmacist's Inventory of Learning Styles

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Authors' contributions

Conceptualization: SK, AA; Methodology: SK, AA; Formal analysis: SK, AA; Investigation: SK; Writing-original draft: SK, AA; Resources: AA, BB; Writing - review & editing: AA, BB; Supervision: BB. All authors read and approved the final version manuscript.

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Availability of data and materials

The data sets supporting the conclusions of this article are available in excel file and can be provided if requested.

Ethics approval and consent to participate

The study was performed in accordance with the ethical principles contained in the declaration of Helsinki. An oral consent was obtained from students after explaining the structure and objectives of this project. The NEU Institutional Review Board committee approved the study and assigned this research as an educational activity (Ref No. YDU/2018/62–649).

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Publisher's Note

Appendix D.

Curriculum Vita

Sarah KHAMIS

Research assistant

PhD candidate in clinical pharmacy

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NATIONALITY

Yemeni

WORK EXPERIENCE

A research assistant, lecturer and preceptor in clinical pharmacy department
Pharmacy faculty in Near East University, North Cyprus
05/2018 - Present

Clinical pharmacist in drug information center
Near East Hospital, North Cyprus
05/2917 - Present

Hospital pharmacist
Near East Hospital pharmacy, North Cyprus
07/2018 - 02/2019

Quilty control
Freesia for Pharmaceutical and Cosmetic Industry, Yemen
09/2104 - 05/2015

EDUCATION

Preparing PhD degree in clinical pharmacy
Near East University
03/2017 - Present
Thesis
- Students' Attitude toward Continuing Professional Development and Preparedness to Become Life Long Learners

MSc in Clinical Pharmacy
Near East University
10/2015 - 02/2017 *Excellent*
Thesis
- **Applying Beers Criteria for Elderly Patients to Assess Rational Drug Use In Northern Cyprus**

Pharmacy
Yemen University of Science And Technology
2009 - 2014 *Very Good*
Project
- Preparing nanoparticales

WORKSHOP

1. Continuing Professional Development
2. Lifelong Learning
3. Smart Pharmacy
4. Personal analysis SWAT
5. Teaching technique
6. Providing care in complex polypharmacy, are there tools which help?
7. The monitoring of psychotropic drug use in (institutionalized) older patients.
8. Planning and running a workshop
9. International collaboration in designing and conducting research studies- ESCP Research Committee Workshop

ONLINE COURSES AND WEBINARS

1.Clinical Supervision: Teaching and Facilitating Learning
2. Digital Health: Where does pharmacy stand?
3. AcPS and WDH Webinar#3-Innovations of IPE Implementation
4. Pathway to Leadership in STEM through Entrepreneurship "Webinar"
5. The Greatest Test of Mental Wellbeing and Emotional Intelligence "Webinar"
6. Live Long Learning from COVD-19 "Webinar"
7. Impact of COVID-19 on Pharmacy Education: Perspective from students & academics "Webinar"
8. MyDispense: A virtual simulation to teach pharmacy students across the globe "Webinar"
9. Monoclonal antibodies and antibody-drug conjugates in oncology - clinical cases "Webinar"
10. the American Society of Health-System Pharmacists: Pharmacy's fight against COVID-19 in the US "Webinar"
11. FIP guidance on COVID-19 for pharmacists and the pharmacy workforce

SKILLS

Continuing professional development skills	Self analysis skills
Emotional Intelligence	Attention to Detail
Self-Directed lifelong learner skills	Creative problem solving skills

LANGUAGES

Arabic
Native or Bilingual Proficiency

English
Professional Working Proficiency

Turkish
Limited Working Proficiency

PUBLICATIONS

Original Research
Applying Beers Criteria for Elderly Patients to Assess Rational Drug Use in Northern Cyprus. Article under review for publication (1st author)
2019

Original Research
Knowledge, Attitude and Practice of Self-medication among Pharmacy Students in North Cyprus (1st author).
2019

Original Research
Antibiotic utilization patterns in children admitted to a pediatric general medical ward in North Cyprus "3rd author"
2020

CONFERENCES & AWARDS

25th National Pharmacology Congress, 9th Clinical Pharmacology Symposium and 8th Clinical Toxicology Symposium 4-7 November in Kuşadası.
2019

48th European Symposium on Clinical Pharmacy, Ljubljana, Slovenia as co-author in poster and the presenter.
2019

12th International Symposium on Pharmaceutical Science as poster presenter. In Ankara University- Ankara Turkey.
2018

77th FIP World Congress of Pharmacy and Pharmaceutical Sciences as co-author in poster. Seoul, Republic of Korea.
2017

2nd International Gazi Pharma Symposium Series as presenter. In Gazi University- Ankara Turkey.
2017

Awarded to a fully funded Yunus Emre Institute organization Turkish Literature Summer school for one month at turkey.
2017

2nd International Symposium & Workshop of NEU Company Simulator Center: Solid Dosage Formulation & Process Development "QbD/PAT in Mind". 13&14 November, TRNC.
2015

INTERESTS

Volunteering and community involvement | Writing | Positive Psychology | Artificial intelligence | Photography | Travel | Enjoy life | Reading | Arts | Listening to the natural voice | Meditation and hypnosis | Yemen

SKILLS

Time management and responsibility

Uptodate

Virtual learning and teaching

Critical thinking, flexibility, teamwork, organization,

Worked, founded, good presenting, Leadership and communication skills.

Very good computer skills and statistic analysis programs

Researches methods and writing skills

VOLUNTEER EXPERIENCE

Founder
Establish a volunteer association "Youth Charitable Imprint" in Yemen to provide school supplies for orphans and refugees.

Teacher/Supervisor
Participate in a social volunteer association " Teach me" that contribute to teach the primary school student for free after stopping schools in the war situation in Yemen.

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