Saudi Pharmaceutical Journal 32 (2024) 102083

HOSTED BY

Contents lists available at ScienceDirect

Saudi Pharmaceutical Journal

journal homepage: www.sciencedirect.com

Evaluation of factors affecting pharmacists and pharmacy technicians' satisfaction towards practicing CE activities in Saudi Arabia

Raniah Aljadeed [a,1], Rana Aljadeed [a,1], Wasmeah Alsamti [b], Hadeel Alharbi [b], Rand Alturki [b], Haya Almalag [a], Lobna Aljuffali [a], Jawza Alsabhan [a], Noha AlAloola [a], Hadeel Alkofide [a,c], Rihaf Alfaraj [d], Njoud Altuwaijri [d], Nora Alkhudair [a], Lamya Alnaim [a], Ghada Bawazeer [a,*]

[a] Department of Clinical Pharmacy, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia
[b] College of Pharmacy, King Saud University, Riyadh, Saudi Arabia
[c] Drug Regulations Research Unit, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia
[d] Department of Pharmaceutics, College of Pharmacy, King Saud University, Riyadh, Saudi Arabia

ARTICLE INFO

Keywords:
Facilitators
Barriers
Pharmacists
Pharmacy technicians, CPD, CE
Conferences
Seminars
Preference, Saudi Arabia

ABSTRACT

Background: Continuing education (CE) is an essential requirement for pharmacy professionals to stay abreast with the evolving knowledge and skills of the practice and meet the regulatory mandate. The purpose of this research is to assess factors affecting the satisfaction of pharmacists and pharmacy technicians towards CE practices in Saudi Arabia.

Material and methods: A self-administered survey instrument was developed following an extensive literature search. The questionnaire consisted of three sections: participants' demographics, data on CE activities over the past year and overall satisfaction, and statements of barriers (14 items) and facilitators (12 items) for participation in CE activities (scored on a 5-point Likert scale (5 = always, 1 = never)). The survey was piloted and then distributed as a link through the Saudi Commission for Health Specialties and Saudi Pharmaceutical Society (SPS) between Jan 2018 and Feb 2019.

Results: Data was available on 398 pharmacists and 40 pharmacy technicians (completion rate was 55 %). The majority were practitioners, male, working in a hospital setting and had more than five years of practice experience. Half of the participants were from the Central Region and about one-third were non-Saudi. Only a quarter of the participants were satisfied/very satisfied with the current CE practices in Saudi Arabia. Job constraints (62.7 %), cost (55.9 %), schedule of CE activities (55.4 %), lack of information on CE opportunities (53 %) and professional burnout (49.7 %) were the top barriers. There was a significant level of dissatisfaction among pharmacy technicians when compared to pharmacists ($p = 0.003$), as well as among Saudi pharmacists when compared to non-Saudi pharmacists ($p = 0.002$). Lack of relevant CE activities ($p = 0.05$), lack of quality activities ($p = 0.002$), lack of recognition ($p = 0.013$) and lack of internet access ($p = 0.006$) were significantly more barriers for pharmacy technicians compared to pharmacists. The most identified facilitators to engage in CE activities were a personal desire to learn (78.4 %), the requirement to maintain a professional license (73.8 %) and relaxation provided by learning (58.5 %) and networking opportunities (53.4 %). The majority of the participants preferred conferences or interactive workshops, short CE over half a day or less, and the topic of disease management/drug therapy.

Conclusion: The findings of the study highlight the need for a partnership strategy that includes various stakeholders to improve CE program quality and accessibility that supports and promotes the professional development of pharmacists and pharmacy technicians in Saudi Arabia. It also underscores the importance of meeting the preferences of pharmacy practitioners when designing CE programs and aligning such activities with their practices.

* Corresponding author.
E-mail addresses: raaljadeed@ksu.edu.sa (R. Aljadeed), rana.aljadeed@gmail.com (R. Aljadeed), Wasmeah.a.alsamti@gmail.com (W. Alsamti), Ph.halharbi1@gmail.com (H. Alharbi), alturki.a.rand@gmail.com (R. Alturki), halmalaq@ksu.edu.sa (H. Almalag), laljaffali@ksu.edu.sa (L. Aljuffali), jawza@ksu.edu.sa (J. Alsabhan), nalaloola@ksu.edu.sa (N. AlAloola), halkofide@ksu.edu.sa (H. Alkofide), ralfaraj@ksu.edu.sa (R. Alfaraj), naltuwaijri@ksu.edu.sa (N. Altuwaijri), naalkhudair@ksu.edu.sa (N. Alkhudair), lalnaim@ksu.edu.sa (L. Alnaim), gbawazeer@ksu.edu.sa (G. Bawazeer).
[1] First Co-author (equal contribution).

https://doi.org/10.1016/j.jsps.2024.102083
Received 11 February 2024; Accepted 21 April 2024
Available online 1 May 2024

1. Introduction

Healthcare is a dynamic field with rapidly evolving knowledge and practices, making it imperative for professionals to broaden their knowledge, and stay current with best practices, new treatments, and emerging technologies. Continuous professional development (CPD) and continuous education (CE) are means through which healthcare professionals can sustain such professional responsibility required for patient safety, effective care, and professional growth. Pharmacy organizations define CPD as "the 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). CE, on the other hand, refers to the structured educational activities a professional is engaged in to support their continuous education and development (Education ACfP. Guidance on continuing professional development (CPD) for the profession of pharmacy, 2015). CE is a component of CPD, however, both terms are sometimes used interchangeably. CPD is a more individualized approach to professional development that recognizes the broader learning needs of each practitioner.

Many authorities overseeing healthcare licensure impose distinct CE or CPD prerequisites for license renewal to ensure healthcare providers continue to meet high standards and remain up to date with a set current practices (IOM, 2010; Meštrović and Rouse, 2015; Wheeler and Chisholm-Burns, 2018). These requirements vary across the world but essentially mandate number of CE/CPD hours over a specific renewal cycle. In the United States, the CE model is the standard for maintaining professional pharmacy competencies (Wheeler and Chisholm-Burns, 2018). All licensed pharmacists must complete a specified amount of state-approved CE activity hours to support licensure (Owen et al., 2020; Travlos et al., 2017). In the United Kingdom, Australia, New Zealand, and Canada the CPD model is adopted (McMullen et al., 2023). This flexible model, allows pharmacist professionals to identify their own CPD goals, needs and the format that suits their preferences (Wheeler and Chisholm-Burns, 2018). Regardless of the model, the literature outlined several barriers and facilitators when fulfilling such professional obligations. Time constraints, motivation, quality of CE activities, family commitment and cost were among the many factors reported (Aziz et al., 2013; Hanson et al., 2007; Power et al., 2011; Tsoi et al., 2016).

In the Kingdom of Saudi Arabia (KSA), pharmacists are registered healthcare professionals with the Saudi Commission for Health Specialties (SCFHS). Pharmacists must complete 40 h of CE activities over a 2-year renewal cycle (20 h/year). Acceptable types of activities include conference attendance, seminars, workshops, training courses, research, journal articles and book publication. Online self-directed learning and internal activities are also acceptable but limited to 15 CE hours (Almaghaslah and Alsayari, 2021). There are a few studies that explored CE practices, facilitators, and obstacles among pharmacists in KSA. These studies were small, and limited to specific positions, regions, and/or practice settings (Al-Ghamdi, 2001; Alharthi et al., 2021; Kandasamy et al., 2023). Moreover, pharmacy technicians (PhTc) are considered regulated professionals in pharmacy and are needed to undertake mandatory continuing professional development CPD/CE in many places around the world including KSA (Wheeler et al., 2020). Nations such as the US, UK, Canada, and Australia have acknowledged the significance of enhancing and broadening PhTc abilities by implementing mandatory professional development and licensing requirements (Krevesky et al., 2012; Schafheutle et al., 2012; Wheeler et al., 2020).

Pharmacy technicians in KSA are also obligated to pass the license exam and renew their professional status every two years by completing a total of 20 CE hours. Yet, studies evaluating PhTc practices and attitudes towards participation in CE activities in KSA are scarce or non-existent. The study aims to explore pharmacists and pharmacy technicians' satisfaction with professional development practices their perceived facilitators and barriers when fulfilling such professional obligations in KSA.

2. Material and methods

2.1. Study Design and participants

This is a cross-sectional self-administered questionnaire-based study conducted between Jan 2018 and Feb 2019. The study targeted all pharmacists and PhTc registered in SCFHS and Saudi Pharmaceutical Society (SPS) databases.

2.2. Questionnaire tool

The questionnaire tool was developed after an extensive literature review (Aziz et al., 2013; Hasan, 2009; Iskandar et al., 2018; Power et al., 2011; Tsoi et al., 2016). The content and face validity of the questionnaire were reviewed by 2 authors (GB and HK). The questionnaire consisted of three parts. Part 1 gathered data on participants' demographics, practice settings and experiences. Part 2 collected data on participants' practices and preferences of CE activities over the past year and their overall satisfaction (ranging from very satisfied to very unsatisfied). Part 3 featured items concerning barriers (14 items) and facilitators (12 items) for participation in CE activities, perception was collected based on a 5-point Likert scale (5 = always, 1 = never). The questionnaire was piloted by 10 pharmacists from different practice settings. The final questionnaire was amended based on feedback. The results of the pilot study were not included in the research. The questionnaire was written in English, but an Arabic translation was added next to each item. SurveyMonkey™ platform was used to host the survey and provide the dissemination link.

2.3. Ethical considerations

The ethical approval was obtained from King Saud University Medical City at King Saud University, Riyadh, KSA. Approval number E-18–3221 on May 14th, 2018. A formal letter was sent to the SCFHS and SPS to distribute the survey link among the pharmacy professionals on their databases along with the IRB approval and participants' consent. On the online survey link, all participants were asked to provide consent before attempting the survey. Participation in the study was voluntary, and participants had the right to decline or quit the survey at any time without any penalty.

2.4. Statistical analysis

Responses were downloaded, coded, and entered and analyzed using R statistical software Version 4.3.1. The results were described as frequency and percentage (categorical data) or as mean and standard deviation (continuous data). The independent student *t*-test was used to compare pharmacists and pharmacy technicians. We set a p-value of 0.05 for statistical significance.

3. Results

The link was accessed by 799 pharmacy professionals, and 438 (55 %) were complete responses. This final sample included 398 pharmacists and 40 pharmacy technicians. Half of the participants were from outside the Central Region. The majority were practitioners, male gender, working in hospital settings and had more than five years of practice experience. Non-Saudi pharmacists represented one-third of the participants and almost 20 % of the study population reported CE requirements by pharmacy regulators other than SCFHC. Details of the socio-demographic data are presented in Table 1.

More than half of the participants earned CE hours by attending conferences. Employer support was extremely low, with less than 5 % of employers providing full assistance. Nonetheless, more than half of the

Table 1
Participants Socio-demographic Information.

	Total	Pharmacists	Pharmacy Technicians
Variables*	**n = 438**	**n = 398**	**n = 40**
Age (years)			
30–39	216 (49.3)	185 (46.5)	31 (77.5)
40–49	94 (21.5)	90 (22.6)	4 (10.0)
<30	90 (20.5)	85 (21.4)	5 (12.5)
>50	37 (8.4)	37 (9.3)	0 (0.0)
Gender			
Female	162 (37.0)	153 (38.4)	9 (22.5)
Male	276 (63.0)	245 (61.6)	31 (77.5)
Nationality			
Non-Saudi	133 (30.4)	130 (32.7)	3 (7.5)
Saudi	305 (69.6)	268 (67.3)	37 (92.5)
Initial degree			
Bachelor	317 (72.4)	316 (79.4)	1 (2.5)
Diploma	52 (11.9)	13 (3.3)	39 (97.5)
PharmD	69 (15.8)	69 (17.3)	0 (0.0)
Postgraduate Studies			
Master	108 (24.7)	107 (26.9)	1 (2.5)
PhD	21 (4.8)	21 (5.3)	0 (0.0)
General residency	12 (2.7)	11 (2.8)	1 (2.5)
Specialized residency	12 (2.7)	11 (2.8)	1 (2.5)
None	285 (65.1)	248 (62.3)	37 (92.5)
Practice setting			
Academia	44 (10.0)	43 (10.8)	1 (2.5)
Community	57 (13.0)	57 (14.3)	0 (0.0)
Hospital	269 (61.4)	231 (58.0)	38 (95.0)
Industry	47 (10.7)	46 (11.6)	1 (2.5)
Regulatory	21 (4.8)	21 (5.3)	0 (0.0)
Position			
Management	133 (30.4)	129 (32.4)	4 (10.0)
Practitioner/ Staff	305 (69.6)	269 (67.6)	36 (90.0)
Province			
Central	219 (50.0)	199 (50.0)	20 (50.0)
Eastern	61 (13.9)	56 (14.1)	5 (12.5)
Northern	14 (3.2)	13 (3.3)	1 (2.5)
Southern	34 (7.8)	30 (7.5)	4 (10.0)
Western	110 (25.1)	100 (25.1)	10 (25.0)
Years in Practice			
≤5	120 (27.4)	103 (25.9)	17 (42.5)
6–10	115 (26.3)	102 (25.6)	13 (32.5)
11–15	85 (19.4)	78 (19.6)	7 (17.5)
16–20	60 (13.7)	59 (14.8)	1 (2.5)
>20	58 (13.2)	56 (14.1)	2 (5.0)
Membership in Professional Societies			
No	225 (51.4)	200 (50.3)	25 (62.5)
Yes	213 (48.6)	198 (49.7)	15 (37.5)
CE required by other Pharmacy board regulators (outside KSA)			
Yes	52 (11.9)	49 (12.3)	3 (7.5)
No	386 (88.1)	349 (87.7)	92.5)

* Variables are reported as number (%).

respondents said that their employers provided partial support, either in the form of allocated time or some financial support. The participants' preferences for CE activities were comparable across pharmacists and PhTc. The most popular format was live presentations (50.4 %), this is followed by Hands-on workshops (17.8 %), and internet-based activities (14.1 %). Table 2 displays the continuing education practices followed by pharmacists and pharmacy technicians in the past year.

4. Barriers and facilitators for CE activities

Among the 14 barrier items, job constraints (demanding workloads, which may include long working hours, rotating shifts, or on-call responsibilities), cost, schedule of CE activities (time and location), lack of information about available CE opportunities and professional burnout were the most perceived barriers (always/often). Fig. 1 depicts the overall perception of the barriers to engaging in CE activities. For instance, the job constraint barrier was perceived by 62.7 % of the participants (always 27.6 % and often 35.1 %). Personal desire to learn, requirement to maintain a professional license, relaxation provided by learning and opportunity for networking were the most perceived facilitators to participate in CE activities reported by more than half of the participants (Fig. 2). There was a significant difference between pharmacists' and PhTc perceptions of barriers and job facilitators. More pharmacists identified the schedule of the CE as the main barrier ($p = 0.002$), while PhTc significantly perceived the barriers due to lack of relevant CE activities ($p = 0.05$), lack of quality activities ($p = 0.002$), Lack of recognition for participating in learning activities ($p = 0.013$) and lack of internet access ($p = 0.006$). PhTc significantly perceived ease of access to learning opportunities as a facilitator ($p = 0.001$). Compared to men, more women highlighted enjoyment/relaxation offered by learning as a change of pace from the ''routine'' ($p = 0.009$) and support from family, colleagues, and friends ($p = 0.025$) as essential facilitators.

5. Overall satisfaction with CE activities

Overall, 25.4 % of the participants expressed satisfaction or high satisfaction with the present CE activities, while 41.6 % expressed dissatisfaction or high dissatisfaction, and 30 % remained indifferent.

Table 2
Pharmacists and Pharmacy Technicians Participation in CE Activities and Employers Support.

	Total	Pharmacists	Technicians
Variables*	n = 438	n = 398	n = 40
The most common type of CE activities participants were engaged in this past year			
Conferences	229 (52.3)	205 (51.5)	24 (60.0)
Internet-based activities	57 (13.0)	54 (13.6)	3 (7.5)
Seminars	43 (9.8)	39 (9.8)	4 (10.0)
Training courses	37 (8.4)	33 (8.3)	4 (10.0)
Internal activities	31 (7.1)	28 (7.0)	3 (7.5)
Specialized Workshops	12 (2.7)	11 (2.8)	1 (2.5)
Others	29 (6.7)	28 (7.1)	1 (2.5)
Format of CE activities you mostly preferred**			
Live (in-person) presentations	192 (50.4)	173 (49.7)	19 (57.6)
Hands-on interactive workshops	68 (17.8)	64 (18.3)	4 (12.1)
Internet-based activities (Live-online)	54 (14.1)	50 (14.3)	4 (12.1)
Self-paced, self-study courses (offline)	36 (9.4)	35 (10.0)	1 (3.0)
Others	31 (7.0)	26 (7.0)	5 (15)
Employer support for obtaining CE hours			
No Support at all	202 (46.1)	177 (44.5)	25 (62.5)
Partial Support	217 (49.5)	202 (50.8)	15 (37.5)
Full Support	19 (4.3)	19 (4.8)	0 (0.0)

* Variables are reported as number (%). ** Only 381 out of the original total sample of 438 subjects (348 pharmacists and 33 PhTc) responded to questions related to the preferred format of CE activities.

The level of satisfaction significantly differed by practitioner type (pharmacist or PhTc) and by nationality (Saudi and Non-Saudi). Pharmacy technicians expressed a significant degree of dissatisfaction with the current practice of CE activities compared to pharmacists (p = 0.003). Also, Saudi pharmacists were significantly less satisfied with CE practices compared to non-Saudi (p = 0.002). Fig. 3 illustrates the level of satisfaction among participants.

6. Topics and Duration of CE activities in the future

When asked about preferences on the scope of topics preferred in the future, most individuals preferred disease state management/ drug therapy (Table 3). In addition, participants preferred short CE activities (over hours or half a day) rather than extended durations.

7. Participants open comments

Eighty-one participants left further comments in the open feedback field. Most of the comments reiterated the above-mentioned barriers, most importantly, cost, quality and topics of the CE programs, the relevance of CE to practice, job constraints, lack of support, and untimely announcement of CE activities. Furthermore, a considerable number of comments expressed the view that CE practices in KSA should embrace innovation, offer increased opportunities for online participation, incorporate the use of the Arabic language, and organize more CE activities in smaller cities.

8. Discussion

This research examined the level of satisfaction, factors that influence participation in CE activities as well as practices in acquiring CE hours among pharmacists' and pharmacy technicians' in KSA. The findings revealed a general dissatisfaction (41.6 %) with the current state of CE practices. The desire to learn, the need to maintain professional licenses, a break from routine, and networking were identified as the main facilitators of participating in CE activities. This research also uncovered barriers that potentially hindered pharmacy professionals while pursuing CE activities in KSA and could have contributed to their overall dissatisfaction. Job constraints, CE scheduling, cost, professional burnout, and lack of information about learning opportunities were the most prevalent barriers.

There are similarities in what was learned from this research when compared to similar research from other countries. A study from the USA shows a desire to learn, the requirement to maintain professional licensure, and the pleasure or relaxation of education as the top three motivators for US pharmacists seeking CE (Hanson et al., 2007). Other studies found that motivation is a primary factor for pharmacists' desire to enhance their jobs with new skills and abilities to better patient outcomes and job satisfaction (Hijazeen et al., 2023; Mattsson and Gustafsson, 2020; Tsoi et al., 2016). British pharmacy practitioners similarly reported time restrictions, financial difficulties and resource concerns, and a lack of CE knowledge as the primary obstacles to its pursuit (Donyai et al., 2011). A study from Lebanon also highlighted family and job duties, lack of interest, time, transportation issues, and technology usage as barriers that prevented Lebanese pharmacists from pursuing CE (Sacre et al., 2019). Malaysian pharmacists identified employment restrictions, time constraints, and travel and expense as barriers (Aziz et al., 2013). Other studies noted similar barriers and challenges to CE participation (Al-Kubaisi et al., 2023; Alsaleem et al., 2020; Driesen et al., 2005; Hanson et al., 2007; Hatem et al., 2022; Hijazeen et al., 2023; Kandasamy et al., 2023; Sarayani et al., 2012).

Many participants also identified the lack of relevant learning opportunities, the lack of high-quality learning activities, and the lack of learner-specific activities as barriers to CE participation. Similar findings were reported from another KSA study, where participants stated that interest in the CE topic is one of the main reasons for attending CE activities (Alharthi et al., 2021). Driesen et al. found that uninteresting content hinders CE attendance (Driesen et al., 2005). A systematic review revealed that clear outcomes for the learning and its application into practice and benefit to the workplace are vital for fostering interest in continuing professional development and learning (Micallef and Kayyali, 2019).

Although there was no significant difference in men's and women's satisfaction with CE practices in KSA, more women significantly found the enjoyment/relaxation provided by learning as a change of pace from the ''routine'' and encouragement from family, colleagues, and friends as important facilitators. A survey of Flemish pharmacists in Belgium found that family commitment considerably reduces women's involvement in CE (Driesen et al., 2005). Understandably, the women in this present research saw support from family/friends as a key facilitator.

Pharmacy technicians were significantly less satisfied with CE activities than pharmacists in this study. Despite the small pharmacy technician sample and scant research on their practices, their highlighted barriers and facilitators may provide significant insights for future interventions. PhTc specifically mentioned a lack of suitable, relevant, high-quality learning activities and a lack of acknowledgement for learning activities. This is expected as pharmacists remain the focus of most CE initiatives in KSA. Krevesky et al. found that adapting CPD activities that are aligned with pharmacy technicians' qualification goals and the field of practice resulted in enhancing the relevance of the educational sessions, and increased PhTc CE attendance rates (Krevesky et al., 2012). PhTc also listed restricted internet access as a barrier. Similar findings were reported by other studies and found that lack of internet access is a barrier for both pharmacists and PhTc (Donyai et al., 2011; Micallef and Kayyali, 2019; Schafheutle et al., 2012).

Our study found that most Saudi pharmacists are unsatisfied with the available CE activities in KSA compared to their non-Saudi colleagues. This aligns with an earlier study conducted by Alkhazim et al that found a significant difference between Saudi and non-Saudi healthcare practitioners in their attitude towards CME activities (Alkhazim and Althubaiti, 2014). The study suggested that cultural factors and educational backgrounds may have influenced their perspectives.

In the current research, live, in-person conferences and hands-on interactive workshops were preferred by the participants. A thorough assessment of pharmacists' preferred CE and CPD formats worldwide indicated that face-to-face is preferable when possible (Cunningham et al., 2019; Micallef and Kayyali, 2019; Sacre et al., 2019; Young,

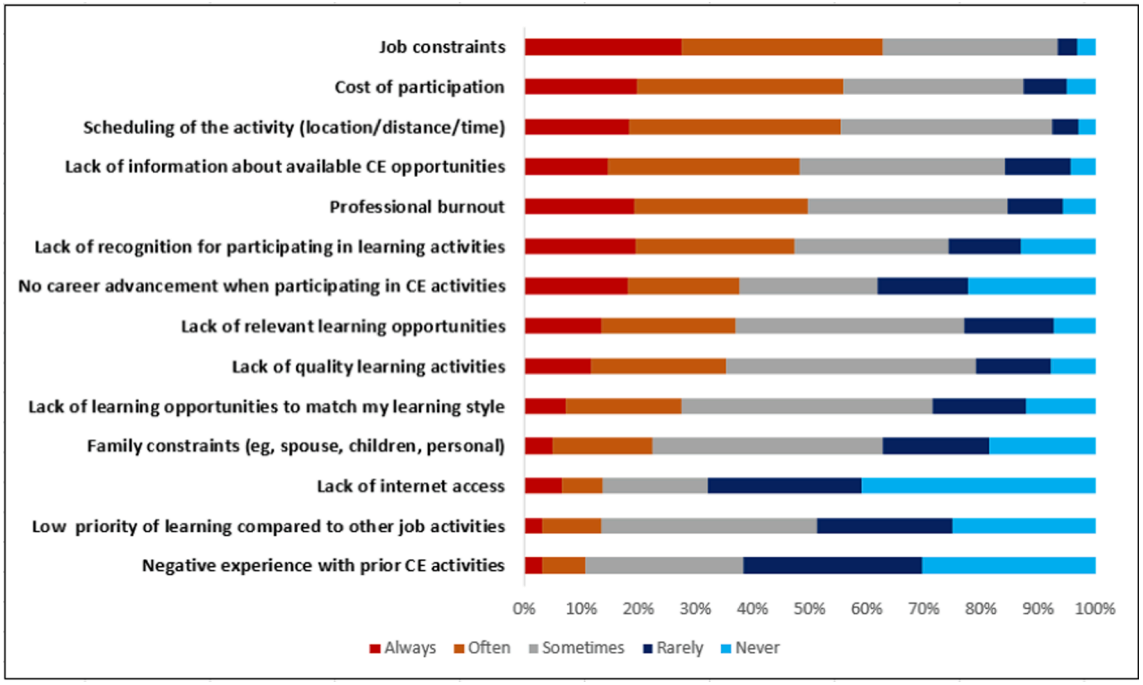

Fig. 1. Overall Perception of the Barriers to Engaging in CE Activities.

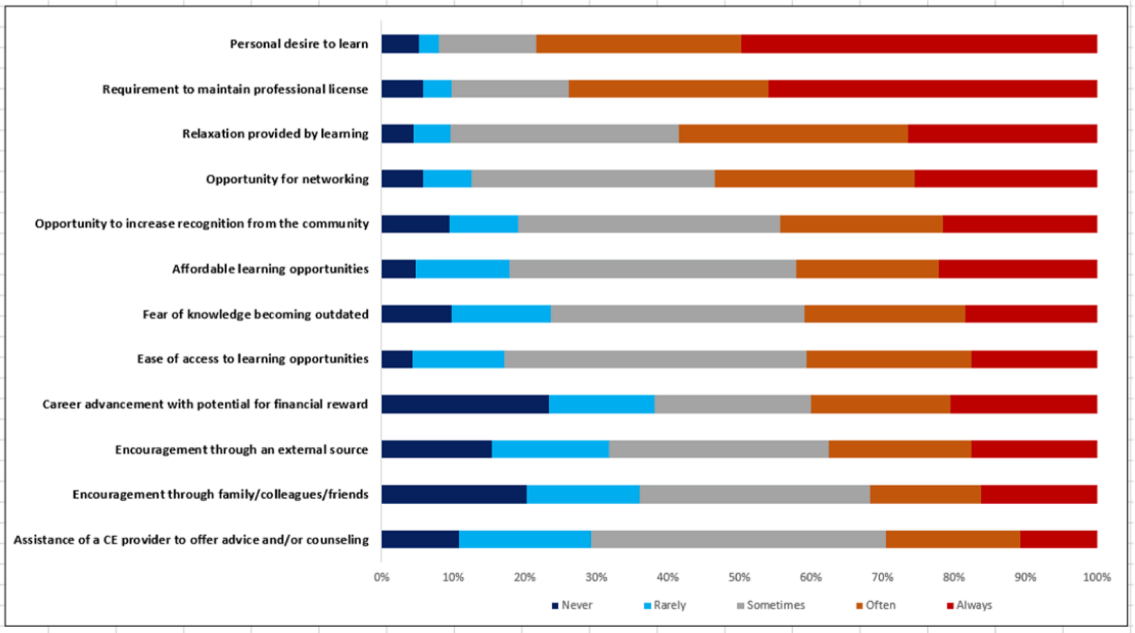

Fig. 2. Overall Perception of the Facilitators to Engaging in CE Activities.

2012). It is possible that the socialization and interprofessional learning that characterize conferences make it a preferred format. Internet activities and self-paced, self-study courses were selected by less than 25 % of participants in our study. A study from Puerto Rico reported that this choice may be attributed to differing learning styles or time, expense, or travel restrictions prohibiting respondents from attending live conferences (Conte, 2012). Regardless of the format, the primary importance is the desire for learning satisfaction and the feeling that one's time was well-invested. (Buxton, 2014; Driesen et al., 2007; Hasan, 2009; Sarayani et al., 2012). The study found that pharmacy professionals in KSA prefer CE topics on disease state management and drug therapy. This is comparable to earlier research from the Eastern region of KSA and Lebanon (Al-Ghamdi, 2001; Iskandar et al., 2018; Sacre et al., 2019). These findings demonstrate that pharmacists acknowledge their increased responsibility as healthcare providers and decision-makers as members of effective healthcare systems.

The current study also found a higher preference for short CE activities. In concordance with this result, Batista et al analyzed 3685 CE activities and found that Portuguese pharmacists had a preference for participating in CE activities completed in less than a day (Batista et al., 2022). In terms of future studies, it may be helpful to evaluate the perception and effectiveness of multiple CE platforms and settings.

This study featured several limitations: in particular, a relatively low survey response rate. As such, the results may limit the generalizability

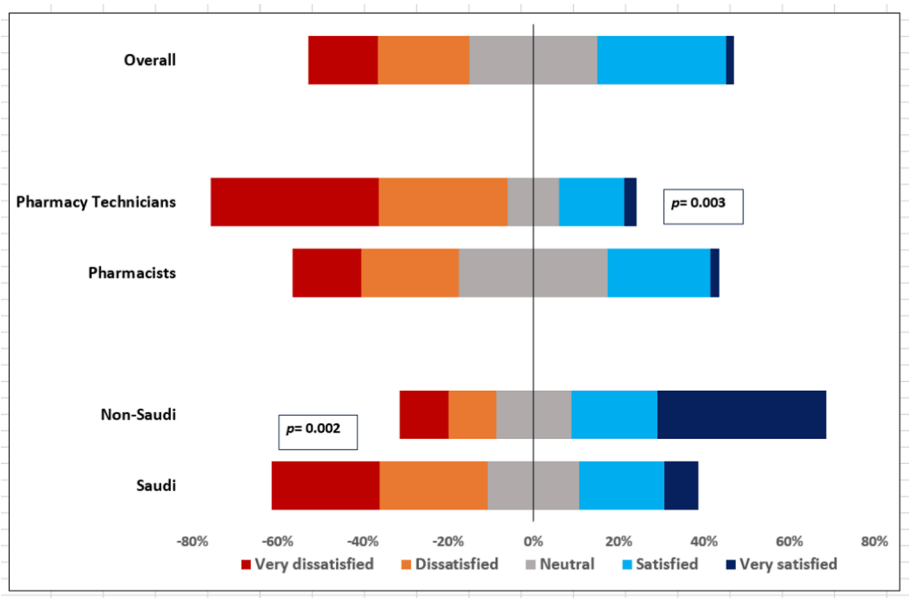

Fig. 3. Level of Satisfaction with CE Activities in Saudi Arabia.

Table 3
Topics and Duration of CE Activities in the Future.

	Total	Pharmacists	Technicians
Variable	n = 340**	n = 310**	n = 30**
The most common scope of topics of CE activities participated in the last year			
Disease Management/Drug therapy	213 (60.3)	195 (60.3)	18 (60.0)
Patient Safety	41 (12.1)	37 (11.9)	4 (13.3)
General Pharmacy	39 (11.5)	34 (11.0)	5 (16.7)
Non-pharmacy related activities	24 (7.1)	23 (7.4)	1 (3.3)
Law (related to pharmacy practice)	23 (6.8)	21 (6.8)	2 (6.7)
Duration of CE Activities			
1–2 Hours	110 (28.8)	102 (29.2)	8 (24.2)
Half day	163 (42.7)	149 (42.7)	14 (42.4)
Weekend option	64 (16.8)	61 (17.5)	3 (9.1)
All day	45 (11.8)	37 (10.6)	8 (24.2)

* Variables are reported as number (%) ** Only 340 out of the original total sample of 438 subjects responded to questions related to topics and duration

Table 4
Implications to Practice and Stakeholder Responsibilities.

Pharmacy Regulators	CE Providers	Employers	Individuals
• Engage with professionals to ensure that CE programs not only meet specified hour requirements but are also aligned with the evolving needs of the pharmacy workforce. Establish a framework that defines the set of skills and competencies needed for self-directed, life-long learning. Reassess the existing CE hour re-quirements to enable a personalized approach while maintaining high-quality CE standards and explore the impact on workplace engagement.	• Design CE programs that are customized to cater to the unique needs and preferences of diverse pharmacy professionals. Utilize innovative approaches to deliver these programs, considering the busy schedules of pharmacy professionals.	• Encourage, assist, acknowledge, and incentivize the accomplishments of pharmacy professionals who actively participate in activities to enhance their professional growth.	• Cultivate a genuine enthusiasm for learning and applying knowledge. Adopt a proactive approach to satisfy both personal and professional growth.

of our findings to all pharmacists in the region. It is important to note that most respondents were pharmacists; only 9 % were identified as pharmacy technicians. This limitation grants future research a chance to explore the experiences and perceptions of pharmacy technicians more comprehensively. Another limitation is that we used the same survey for pharmacists and technicians since both professionals work within the same practice setting and are likely impacted by similar factors. As a result, some participants may have interpreted the questions on education and postgraduate studies differently. However, many technicians could have had a diploma as an initial degree and then underwent a bridging program to a bachelor's degree. Lastly, our data relied on self-reported questionnaires using a Likert scale answer format. Thus, potential response and recall biases may further limit the accuracy of recorded data.

9. Implications for future research and practice

The study results underscore the need for various stakeholders to take proactive measures to enhance this crucial aspect of the pharmacy profession (Table 4). This collaborative effort is essential to create an environment conducive to outstanding learning and skill development within the pharmacy profession. A recent modified Delphi research conducted in KSA emphasized the significance of transitioning from the present CE paradigm to the CPD model (Almaghaslah and Alasayari, 2022). More research is needed to define the CPD framework suitable to the local context, quantifiable and efficient. In addition, more research on innovative CE delivery methods, and the impact of CE/CPD on practice delivery and engagement are warranted. It is worth noting that our study was conducted before the COVID-19 pandemic. A scoping review found that CE/CPD innovation during the lockout will affect

future CPD delivery and accelerate the adaptation of new creative online resources, increased use of the existing online platforms/software and the use of simulation for teaching and learning (Soklaridis et al., 2022). The impact of the pandemic on future CE delivery in KSA is still to be investigated.

10. Conclusion

The study underscores the dissatisfaction among pharmacists and pharmacy technicians in KSA regarding the practices and available options for continuing education activities. It identifies important factors that drive participation in CE activities, such as motivation and the commitment to maintaining professional licenses. However, the study also highlights significant barriers that need to be resolved collaboratively by regulators, providers, employers, and learners. These barriers once addressed can pave the way to a more satisfactory and effective professional development landscape for pharmacy professionals in Saudi Arabia.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Raniah Aljadeed: Writing – original draft, Visualization. **Rana Aljadeed:** Writing – original draft, Visualization. **Wasmeah Alsamti:** Methodology, Data curation. **Hadeel Alharbi:** Methodology, Data curation. **Rand Alturki:** Methodology, Data curation. **Haya Almalag:** Methodology, Formal analysis. **Lobna Aljuffali:** Writing – review & editing, Visualization. **Jawza Alsabhan:** Writing – original draft, Visualization. **Noha AlAloola:** Writing – review & editing. **Hadeel Alkofide:** Validation, Supervision, Software, Methodology, Formal analysis, Conceptualization. **Rihaf Alfaraj:** Writing – review & editing. **Njoud Altuwaijri:** Writing – review & editing. **Nora Alkhudair:** Writing – review & editing. **Lamya Alnaim:** Writing – review & editing, Formal analysis. **Ghada Bawazeer:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Conceptualization, Software.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Al-Ghamdi, M.S., 2001. Continuing pharmaceutical education for community pharmacists in the eastern province of Saudi Arabia. J. Fam. Community Med. 8 (3), 45.
Alharthi, N.M., Alsaeed, M.S., Alsharif, M.O., Almalki, M.G., Alshehri, W.S., Prabahar, K., 2021. Assessment of pharmacists' perception toward continuing education. J. Adv. Pharm. Technol. Res. 12 (4), 368–372.
Alkhazim, M., Althubaiti, A., 2014. Continuing medical education in Saudi Arabia: experiences and perception of participants. J. Health Specialties. 2 (1), 13.
Al-Kubaisi, K.A., Elnour, A.A., Sadeq, A., 2023. Factors influencing pharmacists' participation in continuing education activities in the United Arab Emirates: insights and implications from a cross-sectional study. J. Pharm. Policy Pract. 16 (1), 112.
Almaghaslah, D., Alasayari, A., 2022. A modified Delphi study to establish consensus on continuing education requirements for pharmacists' relicensing in Saudi Arabia. Eur. Rev. Med. Pharmacol. Sci. 26 (15).
Almaghaslah, D., Alsayari, A., 2021. Using a global systematic framework tool to identify pharmacy workforce development needs: a national case study on Saudi Arabia. Risk Manage. Healthcare Policy 3233–3245.
Alsaleem, S.A., Almoalwi, N.M., Siddiqui, A.F., et al., 2020. Current practices and existing gaps of continuing medical education among resident physicians in Abha City, Saudi Arabia. Int. J. Environ. Res. Public Health 17 (22).
Aziz, Z., Jet, C.N., Rahman, S.S.A., 2013. Continuing professional development: views and barriers toward participation among malaysian pharmacists. Eur. J. Soc. Behav. Sci.. 4 (1), 713.
Batista, J.P., Torre, C., Sousa Lobo, J.M., Sepodes, B., 2022. A review of the continuous professional development system for pharmacists. Hum. Resour. Health 20 (1), 3.
Buxton, E.C., 2014. Pharmacists' perception of synchronous versus asynchronous distance learning for continuing education programs. Am. J. Pharm. Educ. 78 (1), 8.
Conte, N., 2012. First-time-users' impressions of continuing education using the internet. Qual. Assur. Educ. 20 (4), 372–386.
Cunningham, D.E., Alexander, A., Luty, S., Zlotos, L., 2019. CPD preferences and activities of general practitioners, registered pharmacy staff and general practice nurses in NHS Scotland - a questionnaire survey. Education for Primary Care : an Official Publication of the Association of Course Organisers, National Association of GP Tutors, World Organisation of Family Doctors. 30 (4), 220–229.
Donyai, P., Herbert, R.Z., Denicolo, P.M., Alexander, A.M., 2011. British pharmacy professionals' beliefs and participation in continuing professional development: a review of the literature. Int. J. Pharm. Pract. 19 (5), 290–317.
Driesen, A., Leemans, L., Baert, H., Laekeman, G., 2005. Flemish community pharmacists' motivation and views related to continuing education. Pharm. World Sci. 27, 447–452.
Driesen, A., Verbeke, K., Simoens, S., Laekeman, G., 2007. International trends in lifelong learning for pharmacists. Am J Pharm Educ. 71 (3), 52.
Education ACfP. Guidance on continuing professional development (CPD) for the profession of pharmacy. 2015.
Federation IP. FIP statement of professional standards: continuing professional development. 2002.
Hanson, A.L., Bruskiewitz, R.H., Demuth, J.E., 2007. Pharmacists' perceptions of facilitators and barriers to lifelong learning. Am J Pharm Educ. 71 (4), 67.
Hasan, S., 2009. Continuing education needs assessment of pharmacists in the United Arab Emirates. Pharm World Sci. 31 (6), 670–676.
Hatem, G., Ismaiil, L., Awada, S., Ghanem, D., Assi, R.B., Goossens, M., 2022. Evaluation of pharmacists' preferences and barriers to access continuing education: a cross-sectional study in Lebanon. Eval. Health Prof. 45 (4), 420–424.
Hijazeen, R.A.H.A., Khzouz, J.N., Hammad, E.A., Swaiss, A.R., 2023. A qualitative focus on community pharmacists' attitudes and barriers toward continuing professional development: implications for professional practice. Pharmacy Practice (Granada). 21 (3), 5.
IOM. Redesigning Continuing Education in the Health Professions. In: Institute of Medicine Committee on Planning a Continuing Health Professional Education, ed. Washington (DC): National Academies Press (US) 2010.
Iskandar, K., Raad, E.B., Hallit, S., et al., 2018. Assessing the perceptions of pharmacists working in lebanese hospitals on the continuing education preferences. Pharmacy Practice (granada) 16 (2).
Kandasamy, G., Almaghaslah, D., Almanasef, M., 2023. An evaluation of continuing medical education among pharmacists in various pharmacy sectors in the Asir region of Saudi Arabia. Healthcare, Paper presented at.
Krevesky, J.S., Raymond, C.B., Woloschuk, D.M., 2012. Continuing Professional Development for Pharmacy Technicians: Start of an Evolution? Canadian Pharmacists Journal : CPJ = Revue Des Pharmaciens Du 145, 120–122.
Mattsson, S., Gustafsson, M., 2020. Job satisfaction among Swedish Pharmacists. *Pharmacy* 8 (3), 127.
McMullen, J., Arakawa, N., Anderson, C., Pattison, L., McGrath, S., 2023. A systematic review of contemporary competency-based education and training for pharmacy practitioners and students. Res. Soc. Adm. Pharm. 19 (2), 192–217.
Meštrović, A., Rouse, M.J., 2015. Pillars and foundations of quality for continuing education in pharmacy. Am. J. Pharm. Educ. 79 (3).
Micallef, R., Kayyali, R., 2019. A systematic review of models used and preferences for continuing education and continuing professional development of pharmacists. Pharmacy. 7 (4), 154.
Owen, J.A., Skelton, J.B., Maine, L.L., 2020. Advancing the adoption of continuing professional development (CPD) in the United States. Pharmacy. 8 (3), 157.
Power, A., Grammatiki, A., Bates, I., et al., 2011. Factors affecting the views and attitudes of scottish pharmacists to continuing professional development. Int. J. Pharm. Pract. 19 (6), 424–430.
Sacre, H., Tawil, S., Hallit, S., Sili, G., Salameh, P., 2019. Mandatory continuing education for pharmacists in a developing country: assessment of a three-year cycle. Pharmacy Practice (granada) 17 (3).
Sarayani, A., Rashidian, A., Gholami, K., Torkamandi, H., Javadi, M., 2012. Efficacy of continuing education in improving pharmacists' competencies for providing weight management service: three-arm randomized controlled trial. J. Contin. Educ. Health Prof. 32 (3), 163–173.
Schafheutle, E.I., Smith, C., Cutts, C., Higginson, P.J., Noyce, P.R., 2012. Pharmacy technicians' views of learning and practice implementation. Int. J. Pharm. Pract. 20 (3), 141–147.
Soklaridis S, Chowdhury M, Turco MG, et al. Pivoting Continuing Professional Development During the COVID-19 Pandemic: A Narrative Scoping Review of Adaptations and Innovations. *Journal of Continuing Education in the Health Professions.* 2022:10.1097.
Travlos, D.V., Baumgartner, J.L., Rouse, M., Wadelin, J.W., Vlasses, P.H., 2017. Forty years of ACPE CPE accreditation. Am. J. Pharm. Educ. 81 (9), 5998.
Tsoi, S.L.T.A., de Boer, A., Croiset, G., Koster, A.S., Kusurkar, R.A., 2016. Factors influencing participation in continuing professional development: a focus on motivation among pharmacists. J. Contin. Educ. Health Prof. 36 (3), 144–150.

Wheeler, J.S., Chisholm-Burns, M., 2018. The benefit of continuing professional development for continuing pharmacy education. Am. J. Pharm. Educ. 82 (3).
Wheeler, J.S., Gray, J.A., Gentry, C.K., Farr, G.E., 2020. Advancing pharmacy technician training and practice models in the United States: historical perspectives, workforce development needs, and future opportunities. Res. Soc. Admin. Pharm.: RSAP. 16 (4), 587–590.
Young, A.M., 2012. A prescription for reframing continuing pharmacy education in Massachusetts. Northeastern University.