

RESEARCH ARTICLE

Establishing Special Interest Groups (SIGs) as a conceptual educational tool to enhance competencies in pharmaceutical scenarios

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Abstract

Background: Continuous research and collaboration are vital for advancing pharmacy practitioners' competencies. This paper explores the role of pharmacist special interest groups (SIGs) as educational tools and learning models for competency development. Deviating from the traditional structure of empirical research papers, it discusses the current state of continuous professional development (CPD) in pharmacy and the potential of SIGs in enhancing learning for pharmacy professionals. **Methods:** Concepts on the contribution of SIGs to competency enhancement were identified by analysing 14 articles selected from established databases, including Google Scholar, PubMed, and ProQuest. **Results:** Pharmacists' roles have evolved to prioritise patient care, leading to new specialisations and a demand for advanced skills. Comprising professionals and students, SIGs offer opportunities for learning, networking, and collaboration. However, barriers to participation, such as time constraints and unclear benefits, highlight the need for flexible and well-organised groups. **Conclusion:** SIGs address specific interests and can enhance CPD programmes, supporting competency development and framework evolution in the pharmaceutical field. They are proposed as educational tools to address professionals' needs, although further research is required to validate their effectiveness. Establishing future focus groups could sustain, enhance, and advance the roles of SIGs.

Introduction

The rapidly evolving landscape of pharmacy practice requires continuous professional development for pharmacists to adapt to the profession's shifting demands. Pharmacy practice has evolved in response to changes in disease patterns, an ageing population, public health emergencies such as pandemics, and the expanding availability of medical knowledge. Pharmacists must stay updated on advancements in treatments, new medications, and changing approaches to disease management (Elsayed *et al.*, 2015; Mourad *et al.*, 2016; van Huyssteen *et al.*, 2020; Winkelbauer, 2020; Austin *et al.*, 2023; McMullen *et al.*, 2023).

The global expansion of the pharmacy profession has significantly transformed the pharmacist's role within the community (Mohammed *et al.*, 2019; Winkelbauer,

2020). Pharmacists now prioritise patient care and the provision of medication information rather than dispensing and compounding. Continuing education programmes are essential to strengthen pharmacists' roles in the community and improve their skills in effective communication, patient education, and counselling (Mohammed *et al.*, 2019). Public demand for practices to be deemed appropriate, safe, and effective is concurrently rising with these expanding responsibilities (Winkelbauer, 2020).

The development of competencies is crucial for ensuring the long-term sustainability of pharmacy practice. Hence, it is imperative to provide educational tools that enable pharmacists to evaluate their progress and build upon their pre-existing knowledge to foster lifelong and self-regulated learning (Mourad *et al.*, 2016).

Continuous professional development

Continuous professional development (CPD) is the prevailing approach to lifelong learning (Elsayed *et al.*, 2015; Curran *et al.*, 2019; Drude *et al.*, 2019). Successful CPD lies in pharmacists' capacity to identify and evaluate their needs and engage in an educational endeavour that would benefit their practice (Al-Haqan *et al.*, 2020). For example, pharmacists in Serbia acknowledged that the advancement of information technology, the wide range of educational content and models, and the capacity to choose and actively engage in education are effective methods for professional growth (Stojkov *et al.*, 2022).

A European Union (EU)-funded report on CPD and lifelong learning programmes for healthcare professionals in EU and European Free Trade Association (EFTA) countries found that 20 out of 31 countries had a mandatory CPD system for pharmacists, while the rest had voluntary or no CPD. Most programmes assess skills, knowledge, and competencies through credits, hours, activities, or learning outcomes (European Commission, 2015).

In Europe, two professional organisations, the European Association of Hospital Pharmacists (EAHP) and the European Society of Clinical Pharmacy, have founded the European Council for Pharmacy Education Accreditation (ECPHA) in response to the growing need for CPD across Europe. ECPHA is a lifelong learning accrediting body dedicated to improving the quality of continuing education for pharmacists working in healthcare settings throughout Europe. The organisation grants accreditation to live educational events (e.g., webinars) and e-learning resources, ensuring that submitted activities and materials align with European practice (European Association of Hospital Pharmacists, 2024).

CPD is mandatory for practising pharmacists across many countries. In the United States, continuing education and professional development programmes are the primary quality assurance activity for pharmacy practitioners in most jurisdictions (Wheeler *et al.*, 2018; Winkelbauer, 2020). This practice has been adopted globally, with countries such as Australia, New Zealand, the United Kingdom, Ireland, Germany, Spain, and Portugal using CPD for pharmacist accreditation. The Ontario College of Pharmacists has required CPD for almost 20 years (Winkelbauer, 2020), while more recently, in 2019, the South African Pharmacy Council mandated CPD for pharmacist re-registration (van Huyssteen *et al.*, 2020). Most CPD systems evaluate skills, knowledge, and competencies through credits, hours, activities, or learning outcomes (Wheeler *et al.*, 2018; Drumm *et al.*, 2020; Batista *et al.*, 2022).

CPD can be completed through various modes, including lectures, seminars, conferences, online

courses, video conferences and publications (Elsayed *et al.*, 2015). The integration of technology has been found to improve engagement, teaching, and learning (Mourad *et al.*, 2016; Reddy *et al.*, 2023).

Special interest groups

A special interest group (SIG) comprises individuals who share a common goal of advocating for the advancement of a specific domain of knowledge, education, or technology (Infection Prevention Society, 2024). SIGs support members' interests and facilitate continuing education by disseminating current information and advancements in respective fields. SIGs contribute significantly to the development, evaluation, and maintenance of members' interests (American Society of Association Executives, 2017). Activities and regular meetings of SIGs provide a platform for exchanging ideas, sharing specialised knowledge, and collaborating with experts in the field, thereby boosting professional development. Research has demonstrated that lifelong learning is driven by personal desire to learn, professional growth, and "gathering practical knowledge" (International Pharmaceutical Federation, 2014), which aligns with SIGs' purposes and activities.

Special interest groups (SIGs) provide a unique, community-driven complement to existing frameworks and CPD programmes, focusing on real-time knowledge exchange and encouraging mentorship opportunities among pharmacists, students, and experts in specific fields (American Society for Transplantation and Cellular Therapy, 2024; The Paediatric Pharmacy Association, 2024). Unlike CPD programmes, which primarily offer structured learning activities (The CPD Certification Service, 2020), SIGs create a dynamic, peer-supported environment where continuous learning occurs through collaboration, shared goals, and specialised interests that can quickly adapt to emerging trends in pharmacy practice (American Pharmacists Association, 2021; European Association of Hospital Pharmacists, 2024). Viewing SIGs as conceptual educational tools offers a novel perspective on enhancing competencies in pharmacy practice.

This concept paper aims to explore the potential of special interest groups as educational tools for enhancing pharmaceutical competencies, while examining barriers and challenges associated with their implementation.

Methods

The methodology employed in this study involved a narrative review of the literature focused on the role of SIGs in enhancing competencies among pharmacists. The search aimed to identify relevant articles discussing the contributions of SIGs to CPD and competency enhancement within the pharmacy profession. Peer-reviewed papers were identified through Google Scholar, PubMed, and ProQuest. Keywords included "Special Interest Groups," "continuous professional development," "competencies," "pharmacy," and "pharmacists." Boolean operators (AND, OR) were employed to refine the search and combine the keywords effectively. For instance, a typical search was "(Special Interest Groups' OR 'SIGs') AND ('continuous professional development' OR 'CPD') AND (pharmacy OR pharmacists) AND competencies."

Articles were included if they were (i) relevant to pharmacy practice, discussing the role of SIGs in pharmacy or related healthcare fields; (ii) focused on SIGs' contribution to CPD and competency

enhancement; (iii) peer-reviewed to ensure the quality and reliability of the findings; (iv) published between 2007 and 2023. Articles were excluded if they were not peer-reviewed, did not directly address SIGs' role in CPD or competency development, or were duplicates. Accordingly, 14 articles were identified and considered.

Results

The review of the identified literature highlighted SIGs' contribution to competency enhancement in pharmacy. SIGs can influence shifting pharmacists' roles towards more patient-focused care. Beyond supporting the development of specialised skills and knowledge, SIGs promote collaborative environments where professionals and students can engage, network, and gain insights, despite challenges like time constraints and the need for effective leadership. Table I provides a summary of the findings from studies on SIGs in pharmacy and pharmacy practice.

Table I: Studies on special interest groups in pharmacy and pharmacy practice

Study	Focus/Contribution	Key findings
McKee et al., 2007	Barriers to participation in SIGs among students.	Limited time for SIG activities led to a reduced frequency of events, highlighting scheduling as a critical challenge.
Fricke & Gunderman, 2010	Leadership roles in SIG formation and sustainability.	Strong leadership and mentoring were crucial for adapting to evolving needs and ensuring sustainability.
Jang et al., 2013	Challenges in sustaining SIGs due to leadership and interest issues.	Lack of new leadership and varied interest levels among members hindered SIG sustainability.
Fusco et al., 2015	Barriers to membership in professional organizations.	Time, cost, lack of motivation and perceived low benefits were key barriers to joining professional SIGs.
Petersen et al., 2017	Establishment of SIGs among students for educational purposes.	SIGs promote collaboration and networking among students, encouraging engagement and professional development.
Louw et al., 2018	Formation of a public health SIG to increase interest in health sciences among undergraduates.	Students were motivated to join for knowledge, networking, and gaining insights from practitioners. Barriers included time constraints affecting participation in field activities.
Mohammed et al., 2019; Westein et al., 2019	Shift in pharmacists' roles from product-focused to patient-focused care.	SIGs enhance competencies required for patient-centered pharmacy practices by promoting specialized knowledge and skills.
Cheesman et al., 2019	Formation of SIGs in professional organizations through newsletters and informal discussions.	Word-of-mouth and teleconferences played a significant role in establishing the SIG, demonstrating the importance of effective communication.
Hoerger et al., 2019	Use of virtual platforms for geographically dispersed SIG members.	Videoconferencing enabled mentoring and networking opportunities, especially for members in remote locations. COVID-19 accelerated the use of telecommunication for SIG activities.
Gummi et al., 2021	Adjustments in SIG activities for better student engagement.	Scheduling lunchtime and evening meetings increased participation. Activities in early semesters helped avoid conflicts during exam periods.
Dubbs et al., 2021	Importance of meeting frequency and efficiency in SIG sustainability.	Regular but concise meetings kept members engaged, and frequent activities attracted early participation in new SIGs.
Park et al., 2022	Use of social media and newsletters to attract and engage SIG members.	Active social media management and monthly newsletters raised awareness, enhanced participation, and facilitated communication among members.
Kajjimu et al., 2023	Role of SIGs in fostering collaboration and specialized learning among students.	SIGs are valuable in creating learning environments and fostering collaboration among student members.

Pharmacists' responsibilities have shifted from being predominantly product-focused to being more patient-centred, with the provision of clinical pharmacy services prompting the development of new specialisations for an enhanced body of knowledge and skills (Mohammed *et al.*, 2019; Westein *et al.*, 2019). SIGs are commonly established among professionals and students (Petersen *et al.*, 2017; Louw *et al.*, 2018; Kajjimu *et al.*, 2023). Students join SIGs for reasons such as education, collaboration, and networking. In a study from 2018 (Louw *et al.*, 2018), a SIG was created to enhance interest in public health among undergraduate health science students. Participants were motivated to gain knowledge, experience, and a deeper understanding of health sciences (Louw *et al.*, 2018). Members could also network and gain valuable insights from active practitioners and experts in the field. Hence, SIGs could address this need within the pharmacy profession.

Similar to identifying motivations for participation, it is essential to identify the barriers that discourage involvement in and the formation of SIGs. Studies have consistently shown that lack of time is the most common obstacle faced by SIG members (McKee *et al.*, 2007; Petersen *et al.*, 2017; Louw *et al.*, 2018; Gummi *et al.*, 2021). Limited shared availability among all SIG members has made experiential learning opportunities, such as field excursions and community involvement, challenging during the first year of a public health SIG (Louw *et al.*, 2018). Additionally, research has cited factors such as the lack of perceived benefits, time constraints, membership costs, and low motivation as reasons for declining participation in professional organisations (Fusco *et al.*, 2015).

Some considerations should be observed when forming a SIG. A group with an overly narrow focus could alienate potential members, as fewer people may be interested in joining. Conversely, a broad topic can be challenging to manage and may impede the coverage of prospective subjects. Flexibility in meeting frequency, location, and timing is essential to accommodate members' schedules. For instance, student participation in a neurology SIG was hindered by conflicts with other school requirements. Consequently, meetings were scheduled during lunchtime and evening hours, with activities concentrated in the first four weeks of the term to avoid conflicts with exam preparation periods (Gummi *et al.*, 2021). For the student-based family medicine SIG, the frequency of events decreased over time due to the limited availability of both students and faculty (McKee *et al.*, 2007).

The frequency and length of meetings should also be considered. Frequent meetings can be

counterproductive. SIG meetings should be efficient, ensuring discussions are concise and focused. Meeting frequency is another critical factor and depends on members' interest and commitment levels. Organising activities more frequently during the initial stages of the group can entice members (Dubbs *et al.*, 2021). Ultimately, the medium and type of activities should be tailored to the goals and objectives of the SIG.

Leadership is a vital component in any group. Maintaining and enhancing the quality of a SIG requires adaptable leadership that evolves with the group's growth and changing needs. Effective leadership helps implement innovative programmes, operations, structures, and resource management. Identifying future group leaders is essential to ensure smooth handovers and sustain the group's activities. Reflections on the creation of a radiology student interest groups emphasised the importance of selecting leaders who are committed to invest the time and effort needed to advance the group (Fricke & Gunderman, 2010). Another equally vital aspect is the selection of a mentor or advisor to guide the group, preferably one with prior SIG experience. Jang *et al.* in 2013 identified that a lack of new leadership, which resulted in a lack of continuity in the SIGs' programs, was one of the reasons why certain student SIGs were unable to sustain themselves. Unsustainability of a SIG may also reflect differences in interest levels among its members (Jang *et al.*, 2013).

Existing SIGs were formed and established through numerous ways and platforms. For instance, the Association of British Neurologists sustainability SIG was initiated following interest sparked by the association's newsletter. The group evolved from word-of-mouth and informal discussions among members, followed by a series of teleconferences and discussions that formalised it as a SIG (Cheesman *et al.*, 2019). SIGs often emerge from larger institutions rather than starting from scratch and must be effectively marketed to attract participation. The Neurology and Neurosurgery Interest Group (NANSIG) actively manages its social media platforms to raise awareness of events and engage with interested individuals. NANSIG members communicate through subscribed mailing lists, where monthly newsletters provide members with updates on news and opportunities (Park *et al.*, 2022). Given the geographic dispersion of psychologists and behavioural scientists in palliative care, accessible means such as videoconferencing are made available for mentoring and networking opportunities (Hoerger *et al.*, 2019). The COVID-19 pandemic has accelerated the adaptation of modern technology, with online conference calls replacing the previously more frequent face-to-face meetings. The growing popularity of telecommunication indicates its

efficiency in connecting individuals and supporting the establishment and maintenance of more SIGs. Virtual options broaden participation, enabling professionals in remote locations to interact with their peers.

Discussion

Special Interest Groups (SIGs) have emerged as significant platforms for enhancing competencies within pharmacy practice, promoting a collaborative and dynamic environment for professional and student engagement. These groups help equip pharmacists and pharmacy students with the specialised skills and knowledge necessary to meet the evolving demands of the profession, especially as it transitions from a product-focused to a patient-centred paradigm.

Pharmacy has undergone a significant transformation with a shift towards clinical services and patient-centred care. SIGs play a critical role in addressing this shift by promoting advanced specialisation and professional development. They provide a structured forum for pharmacists and students to gain insights into emerging areas of interest, such as public health, neurology, and family medicine, as evidenced by studies on various SIG initiatives. By facilitating access to expertise, networking opportunities, and experiential learning, SIGs help cultivate innovative ideas and practices and set standards for educational and practice-based resources (Roederer *et al.*, 2017).

The International Pharmaceutical Federation (FIP) has demonstrated the global impact of SIGs on the pharmacy profession. FIP's strategic objectives include advancing pharmaceutical sciences globally, supported by six SIGs that facilitate knowledge exchange and professional development among members worldwide. These SIGs offer platforms for sharing expertise in areas such as drug delivery, personalised medicine, and pharmacy practice research, promoting competencies that advance the profession on a global scale (International Pharmaceutical Federation, 2022). The FIP Paediatric Formulation Focus Group, part of the SIG on Drug Delivery and Manufacturing, contributed to global research on age-appropriate medications (International Pharmaceutical Federation, 2023). The FIP's Global Competency Framework (GbCF) serves as a tool for the global recognition and professional growth of the pharmacy workforce. The framework's 123 behavioural statements, categorised into four competency clusters, provide a structured approach to professional development. SIGs aligned with these clusters are vital to promoting the adoption of these behaviours across the profession, thereby enhancing

pharmacists' competencies worldwide (International Pharmaceutical Federation, 2024).

For pharmacy students, SIGs offer unique opportunities to explore and deepen their interest in specific areas. Student-led SIGs in public health have been shown to provide members with invaluable exposure to interdisciplinary knowledge and professional insights, sparking interest in broader health sciences (Louw *et al.*, 2018). Additionally, participation in SIGs enables pharmacy students to establish connections with experienced practitioners, enriching their learning and career pathways.

Despite their benefits, SIGs face barriers that limit participation and hinder growth. Time constraints remain a significant challenge, as professionals and students often struggle to balance SIG activities with academic or professional commitments. Studies have shown that scheduling conflicts and competing priorities frequently interfere with SIG engagement (McKee *et al.* 2007; Louw *et al.* 2018). Additional barriers include limited perceived benefits, high membership costs, and insufficient motivation (Fusco *et al.*, 2015).

The sustainability of SIGs is often threatened by inadequate leadership and fluctuating member interest. Research highlights that the absence of consistent leadership and mentorship can lead to the dissolution of student-led SIGs (Jang *et al.*, 2013). Without clear succession plans or strategies for member retention, SIGs risk losing momentum and failing to achieve long-term impact.

While SIGs should have a clear area of interest, overly narrow topics may alienate potential members. Conversely, overly broad themes can dilute focus and impede meaningful engagement. Striking the right balance is essential for attracting diverse participants while maintaining a cohesive purpose. SIGs must account for the diverse availability of members. Scheduling events during less academically intensive periods, such as the start of terms, and offering virtual participation options can help counteract time constraints. Research has shown how lunchtime and evening meetings successfully accommodated students' schedules and enhanced participation (Gummi *et al.*, 2021).

Effective leadership is essential for the success of SIGs. Identifying dedicated leaders and mentors with relevant experience ensures the group's quality and continuity. Proactive leadership is essential to promoting innovation and sustainability within SIGs (Fricke & Gunderman, 2010).

Mentorship by experienced professionals also provides guidance and credibility to group activities. The Women

Faculty SIG of the American Association of Colleges of Pharmacy (AACCP) focuses on attracting, retaining, and promoting women in academic pharmacy. The personal and professional fulfilment gained from these mentoring relationships plays a significant role in growth and retention within the field, highlighting the importance of institutional support networks (Shields *et al.*, 2023).

Efficient use of modern communication tools and social media platforms can significantly enhance SIG visibility and engagement. As illustrated by NANSIG (Park *et al.*, 2022), active management of online channels and the dissemination of newsletters ensured consistent member engagement and expanded outreach. The COVID-19 pandemic helped highlight the value of virtual platforms in maintaining connectivity and enabling participation from geographically dispersed members. Videoconferencing and online events offer practical solutions to logistical challenges and can broaden the accessibility of SIG activities (Hoerger *et al.*, 2019). Regular assessment of SIG objectives, activities, and member satisfaction is essential. Well-organised, concise meetings and structured activities help maintain interest and prevent burnout. Early-stage frequent activities can attract new members (Dubbs *et al.*, 2021).

Limitations

The analysis was based on a limited number of articles identified through Google Scholar, PubMed, and ProQuest, which may not fully capture the breadth of existing research on SIGs' contributions to enhancing competencies in pharmacy practice. This conceptual, retrospective literature review, without new empirical data or primary research, relied on secondary sources, which may limit the ability to draw definitive conclusions about the impact of SIGs on pharmacy competencies. While the study addresses SIGs across various pharmacy specialisations and professional settings, generalising the findings to all areas of pharmacy practice could overlook the unique challenges and needs specific to different practice settings or specialisations.

Conclusion

SIGs traditionally serve to address the interests and needs of specific individuals. This study has shown that SIGs could contribute to the development of CPD programmes, meeting the needs of group members. SIGs are proposed to enhance the learning process to acquire specific competencies. In addition to serving as a tool for competency enhancement, SIGs could

contribute to the evolution of frameworks, as frameworks in pharmaceutical scenarios go beyond the policy concepts and prove better suited to meet the needs of professionals. Further empirical research is suggested to validate the proposal that SIGs could be used as an educational tool, and future work to confirm these findings could involve forming more focus groups, which will sustain or advance the functions of SIGs in tomorrow's pharmaceutical environment.

Ethics approval

The Research Ethics and Data Protection form (MED-2022-00065) was approved by the University Research Ethics Committee of the University of Malta.

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Conflict of interest

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References

- Al-Haqan, A., Al-Baghli, S., Al-Enizi, A.-B., Al-Dosari, H., & Waheedi, S. (2020). The development and evaluation of a structured continuing professional development programme for pharmacists in Kuwait: A feasibility study. *Pharmacy*, *8*(4), 207. <https://doi.org/10.3390/pharmacy8040207>
- American Pharmacists Association. (2021). *APhA-APPM Special Interest Groups (SIGs)*. <https://www.pharmacist.com/Membership/Get-Involved/Special-Interest-Groups>

- American Society of Association Executives (ASAE). (2017). *How to keep special interest groups relevant*. https://www.asaecenter.org/resources/articles/an_plus/2017/may/how-to-keep-special-interest-groups-relevant
- American Society for Transplantation and Cellular Therapy. (2024). *Special interest groups*. <https://www.astct.org/Membership/Special-Interest-Groups>
- Austin, Z., Andriole, D. A., & Rhoney, D. H. (2023). Is it time for competency-based education to move forward in pharmacy education? *American Journal of Pharmaceutical Education*, **87**(10), 100550–100550. <https://doi.org/10.1016/j.ajpe.2023.100550>
- Batista, J. P. B., Torre, C., Sousa Lobo, J. M., & Sepodes, B. (2022). A review of the continuous professional development system for pharmacists. *Human Resources for Health*, **20**(1), 3–3. <https://doi.org/10.1186/s12960-021-00700-1>
- Cheesman, A., Blackburn, D., Carroll, C., Cohen, A., Coebergh, J., Sokhi, D., Wong, S., & Woolmore, J. (2019). 11.39 Association of British neurologists' sustainability special interest group (ABN sustainability SIG): Formation, objectives, and invitation. *Journal of Neurology, Neurosurgery & Psychiatry*, **90**, A2.3–A3. <https://doi.org/10.1136/jnnp-2019-ABN-2.7>
- Curran, V., Gustafson, D. L., Simmons, K., Lannon, H., Wang, C., Garmsiri, M., Fleet, L., & Wetsch, L. (2019). Adult learners' perceptions of self-directed learning and digital technology usage in continuing professional education: An update for the digital age. *Journal of Adult and Continuing Education*, **25**(1), 74–93. <https://doi.org/10.1177/1477971419827318>
- Drude, K. P., Maheu, M., & Hilty, D. M. (2019). Continuing professional development. *Psychiatric Clinics of North America*, **42**(3), 447–461. <https://doi.org/10.1016/j.psc.2019.05.002>
- Drumm, S., Moriarty, F., Rouse, M. J., Croke, D., & Bradley, C. (2020). The Development of an Accreditation Framework for Continuing Education Activities for Pharmacists. *Pharmacy*, **8**(2), 75. <https://doi.org/10.3390/pharmacy8020075>
- Dubbs, S. B., Moayedi, S., Galbraith, J. W., Lubavin, B., Mattu, A., Haydel, M., Cheaito, M. A., Bond, M. C., & Kazzi, A. (2021). Emergency Medicine Interest Groups. *The Journal of Emergency Medicine*, **60**(1), e13–e17. <https://doi.org/10.1016/j.jemermed.2020.09.043>
- Elsayed, T. M., Jamshed, S. Q., Elkalmi, R. M., Shamsuddin, S.-K. B., Alshahmi, A. M., & Othman, N. B. (2015). Malaysian community pharmacists' perceptions of and barriers to the first year of mandatory continuous education: A nationwide exploratory study. *Currents in Pharmacy Teaching and Learning*, **7**(6), 826–835. <https://doi.org/10.1016/j.cptl.2015.08.014>
- European Association of Hospital Pharmacists. (2024). *What is the European Council for Pharmacy Education Accreditation (ECPHA)?* <https://www.eahp.eu/content/european-council-pharmacy-education-accreditation-0>
- European Association of Hospital Pharmacists (2024). *Special interest group*. <https://eahp.eu/hospital-pharmacy-practice/sigs/>
- European Commission. (2015). *Study concerning the review and mapping of continuous professional development and lifelong learning for health professionals in the EU*. https://health.ec.europa.eu/publications/study-concerning-review-and-mapping-continuous-professional-development-and-lifelong-learning-health_en
- Fricke, B. B., & Gunderman, R. B. (2010). Creating and enhancing radiology student interest groups. *Academic Radiology*, **17**(12), 1567–1569. <https://doi.org/10.1016/j.acra.2010.08.011>
- Fusco, N. M., Prescott, G. M., & Prescott, W. A. (2015, January 1). Motivations for pharmacy students to join professional organizations. *Currents in Pharmacy Teaching and Learning*, **7**(1), 117–120. <https://doi.org/10.1016/j.cptl.2014.09.006>
- Gummi, R., Smith, R., & Govindarajan, R. (2021). Expanding medical student interaction in neurology with a redesigned student interest group in neurology (sign) chapter. *BMC Medical Education*, **21**(1), 217. <https://doi.org/10.1186/s12909-021-02641-8>
- Hoerger, M., Ramos, K., Ellington, L., Perry, L. M., Pollak, K. I., & Porter, L. S. (2019). Organizing psychologists, behavioral scientists, and allied professionals: Formation of the society of behavioral medicine's palliative care special interest group. *Journal of Pain and Symptom Management*, **58**(4), e10–e11. <https://doi.org/10.1016/j.jpainsymman.2019.06.002>
- Infection Prevention Society. (2024). *Special interest groups*. <https://www.ips.uk.net/special-interest-groups>
- International Pharmaceutical Federation. (2014). *Continuing professional development/continuing education in pharmacy: Global report*. The Hague, The Netherlands. <https://www.fip.org/file/1407>
- International Pharmaceutical Federation. (2022). *Pharmaceutical sciences and the special interest groups*. <https://www.fip.org/pharmaceutical-sciences>
- International Pharmaceutical Federation. (2023). *Paediatric oral extemporaneous preparations and practices: FIP Paediatric Formulation Focus Group (PFFG) global survey*. https://www.fip.org/files/fip/BPS/PFFG_compounding_survey_results.pdf
- International Pharmaceutical Federation. (2024). *Supporting the advancement of the profession. The Global Advanced Development Framework*. <https://www.fip.org/gadf>
- Jang, J. H., Alston, J., Tyler, I., Hau, M., Donovan, D., Johnson, I., Shore, B., & Shahin, M. (2013). Enhancing undergraduate public health education through public health interest groups. *Academic Medicine: Journal of the Association of American Medical Colleges*, **88**(7), 1009–1014. <https://doi.org/10.1097/ACM.0b013e318295278f>
- Kajjimu, J., Odakha, J. A., Makai, C., Kaginda, B. T., Nakachwa, J., Karungi, A., Lubega, F., Tukamuwebwa, J., Kakande, R., Lyon, M. E., & Tagg, A. (2023). The role of

emergency medicine interest groups in the development of emergency medicine: A case of Mbarara University of Science and Technology-Emergency Medicine Interest Group (MUST-EMIG) in Uganda. *African Journal of Emergency Medicine: Revue africaine de la medecine d'urgence*, **13**(3), 217–220.

<https://doi.org/10.1016/j.afiem.2023.07.001>

Louw, A., Turner, A., & Wolvaardt, L. (2018). A case study of the use of a special interest group to enhance interest in public health among undergraduate health science students. *Public Health Reviews*, **39**, 11.

<https://doi.org/10.1186/s40985-018-0089-4>

McKee, N. D., McKague, M. A., Ramsden, V. R., & Poole, R. E. (2007). Cultivating interest in family medicine: Family medicine interest group reaches undergraduate medical students. *Canadian Family Physician Medecin de famille canadien*, **53**(4), 661–665.

<https://pubmed.ncbi.nlm.nih.gov/articles/PMC1952595/>

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. *Research in Social and Administrative Pharmacy*, **19**(2), 192–217.

<https://doi.org/10.1016/j.sapharm.2022.09.013>

Mohammed, S. I., Dawood, E. B., & Abaas, I. S. (2019). Perceptions and attitudes of community pharmacists towards patient counseling and continuing pharmacy education programs in Iraq. *Iraqi Journal of Pharmaceutical Sciences*, **28**(2), 30–36.

<https://doi.org/10.31351/vol28iss2pp30-36>

Mourad, A., Jurjus, A., & Hussein, I. H. (2016, October 5). The what or the how: A review of teaching tools and methods in medical education. *Medical Science Educator*, **26**, 723–728. <https://doi.org/10.1007/s40670-016-0323-y>

Park, J. J., Ooi, S. Z. Y., Gillespie, C. S., Bandyopadhyay, S., Chowdhury, Y. A., Solomou, G., Gough, M., Kanmounye, U. S., Yanez Touzet, A., Poon, M. T. C., Demetriades, A. K., Jenkinson, M. D., Jenkins, A., & Neurology and Neurosurgery Interest Group (NANSIG) (2022). The Neurology and Neurosurgery Interest Group (NANSIG)-ten years of cultivating interest in clinical neurosciences. *Acta Neurochirurgica*, **164**(4), 937–946.

<https://doi.org/10.1007/s00701-022-05113-0>

Petersen, E., Wascher, M., & Kier, K. (2017). Analysis of pharmacy student motivators and deterrents for professional organization involvement. *Currents in Pharmacy Teaching & Learning*, **9**(4), 543–550.

<https://doi.org/10.1016/j.cptl.2017.03.024>

Reddy, J. R. K., Raghuvver, R., & Shehansha, S. (2023). Experiential learning in pharma/health care education: Enhancing competence and preparedness. *Journal of Pharmaceutical Sciences and Research*, **15**(5), 1131–1134. <https://www.jpsr.pharmainfo.in/Documents/Volumes/vol15issue05/jpsr15052307.pdf>

Roederer, M. W., Kuo, G. M., Kisor, D. F., Frye, R. F., Hoffman, J. M., Jenkins, J., & Weitzel, K. W. (2017). Pharmacogenomics competencies in pharmacy practice: A blueprint for change. *Journal of the American Pharmacists Association*, **57**(1), 120–125.

<https://doi.org/10.1016/j.japh.2016.08.014>

Shields, K. M., Eiland, L. S., Zitko, K. L., & Wagner, J. L. (2023). Developing authentic mentorship through professional organizations. *American Journal of Pharmaceutical Education*, **87**(3), ajpe9006. <https://doi.org/10.5688/ajpe9006>

Stojkov, S., Arsić, J., Legetic, B., & Jovanović Lješković, N. (2022). Continuing professional development for pharmacists: Preferences, interests and experience. *Acta Medica Medianae*, **61**(2), 36–45.

<https://doi.org/10.5633/amm.2022.0205>

The CPD Certification Service. (2020). *What is continuing professional development*. <https://cpduk.co.uk/explained>

The Paediatric Pharmacy Association (2024). *Special interest groups*. <https://www.ppag.org/?pg=SpecialInterestGroups>

Van Huyssteen, M., Bheekie, A., Srinivas, S. C., & Essack, A. (2020). Continuous professional development for public sector pharmacists in South Africa: A case study of mapping competencies in a pharmacists' preceptor programme. *Pharmacy*, **8**(2), 96.

<https://doi.org/10.3390/pharmacy8020096>

Westein, M. P. D., de Vries, H., Floor, A., Koster, A. S., & Buurma, H. (2019). Development of a postgraduate community pharmacist specialization program using CanMEDS competencies, and entrustable professional activities. *American Journal of Pharmaceutical Education*, **83**(6), 1354–1365. <https://doi.org/10.5688/ajpe6863>

Wheeler, J. S., & Chisholm-Burns, M. (2018). The benefit of continuing professional development for continuing pharmacy education. *American Journal of Pharmaceutical Education*, **82**(3), 198–203.

<https://doi.org/10.5688/ajpe6461>

Winkelbauer, S. (2020). An authentic, practice-based assessment as a catalyst for continuous professional development. *Pharmacy*, **8**(1), 15.

<https://doi.org/10.3390/pharmacy8010015>