PREFERENCES AND NEEDS FOR

CONTINUING PROFESSIONAL DEVELOPMENT

HEALTHCARE PROFESSIONALS' PREFERENCES AND NEEDS FOR CONTINUING PROFESSIONAL DEVELOPMENT ACTIVITIES: A Q-METHODOLOGY STUDY

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Lay Abstract

Background: Continuing professional development (CPD) provides timely clinical information in the current age of rapid knowledge creation. Accelerated by pandemic-related restrictions, healthcare CPD activities have pivoted to alternate delivery formats like online or blended models. Experiences with CPD participation during the COVID-19 pandemic can shape healthcare professionals' preferences and needs, impacting their CPD choice. **Methods**: A cross-sectional, Q-methodology study investigating the preferences and needs of 47 individuals from a range of healthcare professions (physician, nurses, allied health professionals etc.) was conducted. **Results:** This study uncovered four factors, representing different types of CPD participants and their training needs. These groups were namely: "Value and productivity-focused clinicians", "Application and competency-based learners", "Respite seekers", and "Growth-oriented professionals". **Conclusion:** This study uniquely leveraged on Q-methodology's ability to study subjectivity using a limited sample, applying it to a diverse interprofessional population. The identified factors may also help CPD providers to better cater resources and support for the enhancement of CPD quality and participation rates.

Abstract

Background

Continuing professional development (CPD) provides timely clinical information in the current age of rapid knowledge creation. The exigent COVID-19 pandemic created a scenario that required healthcare educators to adopt alternate CPD delivery models to ensure training continuity. These experiences can shape healthcare professionals' (HCPs') preferences and needs, impacting their choice of CPD activities.

Methods

A cross-sectional, Q-methodology study investigating the preferences and needs of 47 individuals from a range of healthcare professions (physicians, nurses, allied health professionals etc.) was conducted. Three phases of Q-methodology were administered: Q-sample generation, Q-sort exercise and by-person factor analysis. Demographic characteristics like age, geographical location, healthcare discipline, and years of practice were also recorded.

Results

A Q-sample containing 40 statements related to HCPs' CPD preferences and needs was derived from the comprehensive literature review and analysis of program evaluation data. The study participants' demographic characteristics were diverse but evenly distributed (age, occupation), with a large majority practising in Ontario, Canada. Following the Q-sort exercise, an analysis of the respective factor loadings, distinguishing statements and available narrative survey data led to the identification of four factors. These factors represent different types of CPD participants and their training needs. Sixteen participants loaded onto Factor 1 (Value and productivity-focused clinicians), ten participants loaded onto Factor 2 (Application and competency-based learners), ten participants loaded onto Factor 3 (Respite seekers), and three participants loaded onto Factor 4 (Growth-oriented professionals). A single consensus statement that highlighted neutral viewpoints towards the need for CPD activities to have "appropriate difficulty and volume of content" was also identified.

Conclusion

This study uniquely leveraged on Q-methodology's ability to study subjectivity using a limited sample, applying it to a diverse interprofessional population. Based on this study's findings about HCPs' CPD priorities, CPD providers should adapt their current CPD offerings to better meet contemporary needs.

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List of abbreviations

CPD – Continuing professional development

HCP – Healthcare professional

CLR – Comprehensive literature review

USA – United States of America

UAE – United Arab Emirates

MacCPD – McMaster University Continuing Professional Development Office

HPE – Health professions education

MD – Medical doctor

UPC – Unique participant code

Declaration of academic achievements

The Student Investigator, Mr Nicholas WS Neo (NN), was responsible for all aspects of this Q-methodology study. This includes the planning, ethics approval, data collection, and data analysis. This final thesis manuscript is also an original research piece prepared by NN. Preliminary findings of this study was presented at the AFMC Continuing Professional Development Research Symposium in May 2024. The final results of this study will be presented at the 40th Annual Q Conference in September 2024. NN is also in the process of submitting this study for journal publication.

The Principal Investigator and supervising faculty, Dr Noori Akhtar-Danesh (NAD), provided methodological expertise (Q-methodology) and guidance to NN throughout the entire thesis process. He also played a significant role during the data analysis phase, specifically advising on the use of the “qfactor” syntax in Stata and interpretation of distinguishing statements generated from statistical analysis. He was also involved in reviewing the final editions of this thesis manuscript.

The thesis committee members, Dr Ruth Chen and Dr Elif Bilgic, attended committee meetings where various aspects of this thesis were discussed. They provided feedback related to data collection and analysis phases of this study. These were done in the capacity of experts in the field of continuing

professional development and health professions education research. They were also involved in reviewing the final editions of this thesis manuscript.

Chapter 1: Introduction

This chapter provides an overview of continuing professional development (CPD) in healthcare and the associated impacts on healthcare professionals' (HCPs') practice. The study rationale and specific research aims are also presented in this section.

Overview

CPD ensures that learning and development persists beyond the initial formal training HCPs receive. CPD is a career-long process that enables the regulation of professional standards and delivery of quality clinical care (Jackson et al., 2015; Manley et al., 2018). CPD also provides timely clinical information in the current age of rapid knowledge creation and evidence-based medicine (Masic, Miokovic & Muhamedagic, 2008; Davis & McMahon, 2018). It is an important avenue to consolidate and communicate the high volume of research that has been generated. CPD participation has been shown to promote practice updates that led to discontinuation of dated conventions with limited or uncertain efficacy (Jackson et al., 2015). Enhanced perception and access to the range of available knowledge and a resulting culture of reflective practice were potential reasons for this (Jackson et al., 2015).

Impact of CPD Participation

The clinical impacts of CPD have been positively reported across the healthcare continuum. Medical CPD, frequently referred to as Continuing Medical Education, has been extensively studied with results consistently concluding improved knowledge, skills, practice behaviour and clinical outcomes (Marinopoulos, 2007; Cervero & Gaines, 2015). CPD have also been shown to exhibit both short and long-term effects on HCPs' practice (Marinopoulos, 2007). Similar improvements were also observed for CPD interventions directed at other healthcare professions. Within nursing, CPD activities have been shown to improve a range of essential nursing skills including, patient assessment, neurological evalutaion, medication administration and calculation, as well as point-of-care competencies (e.g. arterial blood gas interpretation) (Rouleau et al., 2019). Nurses' ability to provide care within niche areas such as rare diseases and palliative care was also improved (Philips et al., 2012; Nicoll et al., 2018). This is also evident within the pharmacy discipline as CPD activities were associated with enhanced knowledge, skills, attitudes, perceptions, and interest for specialized areas such as community and oncology pharmacy (Obreli-Neto et al., 2016; Patel et al., 2021). CPD is also an integral part of allied health professionals' development (French & Dowds, 2008). In-depth understanding, competence, and confidence with the management of different pain pathologies (e.g. knee, back, and neck pain) were reported amongst physiotherapists who underwent CPD activities (French & Dowds, 2008; Barton et al., 2022). Within the

multidisciplinary context, CPD activities also improved interprofessional communication and collaboration (Messmer, 2008). Tame (2013) associated these positive impacts with greater knowledge and confidence for open discussions of healthcare topics. Through these collaborative interactions, the different healthcare professions developed a deeper understanding of each other's roles, contributing to more seamless team functioning (Flores-Sandoval et al., 2021).

Important non-clinical metrics were also improved through CPD. Participation in CPD may improve job motivation, satisfaction, and workforce retention rates (Jackson et al., 2015; Hariyati & Safril, 2018). HCPs associated CPD with professional and social benefits, factors important for the sustainment of professional interest (Carroll et al., 2021). This may also be related to the concept of "intrinsic motivation" which values continuous learning and professional success (Paterson & Edmond, 2019). As HCPs develop their clinical competence through CPD activities, they are gradually granted greater clinical autonomy which also improves job motivation and satisfaction (Smith et al., 2023). Alternate CPD formats like mentorship programs have also been shown to improve both the mentor and mentee's satisfaction within the clinical setting (Smith et al., 2023).

Despite its benefits, CPD participation varies internationally and across the different healthcare professions (Tran et al., 2014). This variability is frequently associated with the differing regulatory mandates. CPD is mandatory for

professional registration and licensure in countries like Canada, United Kingdom and Australia (Tran et al., 2014, Karas et al., 2020, Main & Anderson, 2023). In these regions, HCPs participate in CPD participation regularly and in-accordance with the requirements of their respective professional regulatory bodies (Institute of Medicine, 2010, Tran et al., 2014). On the other hand, variable CPD requirements were noted in countries like Spain, Greece and Kuwait (European Commission, 2015). In these areas, different professional groups and special populations are subjected to varying CPD requirements. In Greece, CPD is largely non-mandatory across the different healthcare professions, with the exception of medical professionals who need to achieve 150 CPD credits every three years, under the European Accreditation Council for Continuing Medical Education system (European Commission, 2015). In Spain, nurses are required to undertake mandatory CPD but no ramifications exist if the requirements are not met (European Commission, 2015). Even though CPD is non-mandatory in Kuwait, regulatory bodies recognized the specific needs of certain populations. Starting from 2019, the Kuwait Ministry of Health requires newly employed pharmacists to undergo an 18-month compulsory foundation training program, consisting of CPD activities, to facilitate their transition into practice (Al-Haqan et al., 2020).

CPD non-participation was associated with poorer practice outcomes due to propensity for siloed and outdated practice (Dowling et al., 2019b; Carroll et al., 2021). Within large practice settings, this impacts the overall clinician skill-mix and nurse-physicians collaboration, which has been shown to affect 30-

day patient mortality (Estabrooks et al., 2005). A study comparing family physicians with differing amounts of CPD accredited hours found that lower rates of CPD participation were associated with greater rates of diagnostic inaccuracy and inappropriate treatment plans (Goulet et al., 2013). Participation in informal and non-accredited CPD formats were also linked to poorer practice quality in the same study (Goulet et al., 2013).

Background

Generational differences within the workforce, professional role advancements and other exigent factors results in constantly evolving needs of HCPs (Olson, 2011; Ruddy et al., 2016). The COVID-19 pandemic created a circumstance that required healthcare educators to innovate and adopt alternate models to ensure training continuity (Jeffries et al., 2022). Educators pivoted to online learning modalities, incorporating synchronous teaching sessions and materials translated into asynchronous formats. Studies evaluating technology-enabled teaching models concluded a beneficia,l or at least equivalent effect on learners' perceptions, acceptance, motivation and engagement, endorsing these format's feasibility (Naciri et al., 2021). Besides healthcare educators, new CPD formats and teaching models were also imposed on CPD participants during the pandemic. These new experiences have the propensity to shape HCPs' viewpoints towards CPD.

Study Rationale

The impact of CPD participation highlights the importance of continuous knowledge pursuit after formal training. As such, the exploration of preferences and needs within CPD remains a pertinent area of inquiry for health professions education researchers. They inform and direct intervention studies that test new training frameworks and modalities to enhance learning (Magwenya et al., 2023).

This study proposes a re-exploration of aspects that influence HCPs' choice of CPD training activities. Existing literature have utilized quantitative surveys to explore HCPs' CPD preferences and needs (Atreya et al., 2022; Smith et al., 2023). However, this study seeks to utilize a different statistical approach to gain greater insights into this area. Through the use of Q-methodology, viewpoints will be ranked, producing important factors that summarizes the current attitudes and opinions. Results from this study would allow CPD organizations to revise their offerings to benefit HCPs as they seek to develop their competencies and skillset.

Research Aims

- Investigate factors that might attract or deter HCPs from participating in a CPD program
- Investigate CPD preferences and needs across the different healthcare disciplines, age, experience levels and location of practice

Chapter 2: Literature Review

This chapter provides a comprehensive literature review (CLR) that summarizes the current knowledge on general and program-specific characteristics that influence HCPs' choice of CPD activities. Information about these characteristics will come from a review of existing literature related to HCPs' experience, needs, facilitators and barriers. Results from this CLR will inform the creation of the Q-sample, a set of statements that represent the entire range of viewpoints pertaining to CPD choice.

Search Strategy

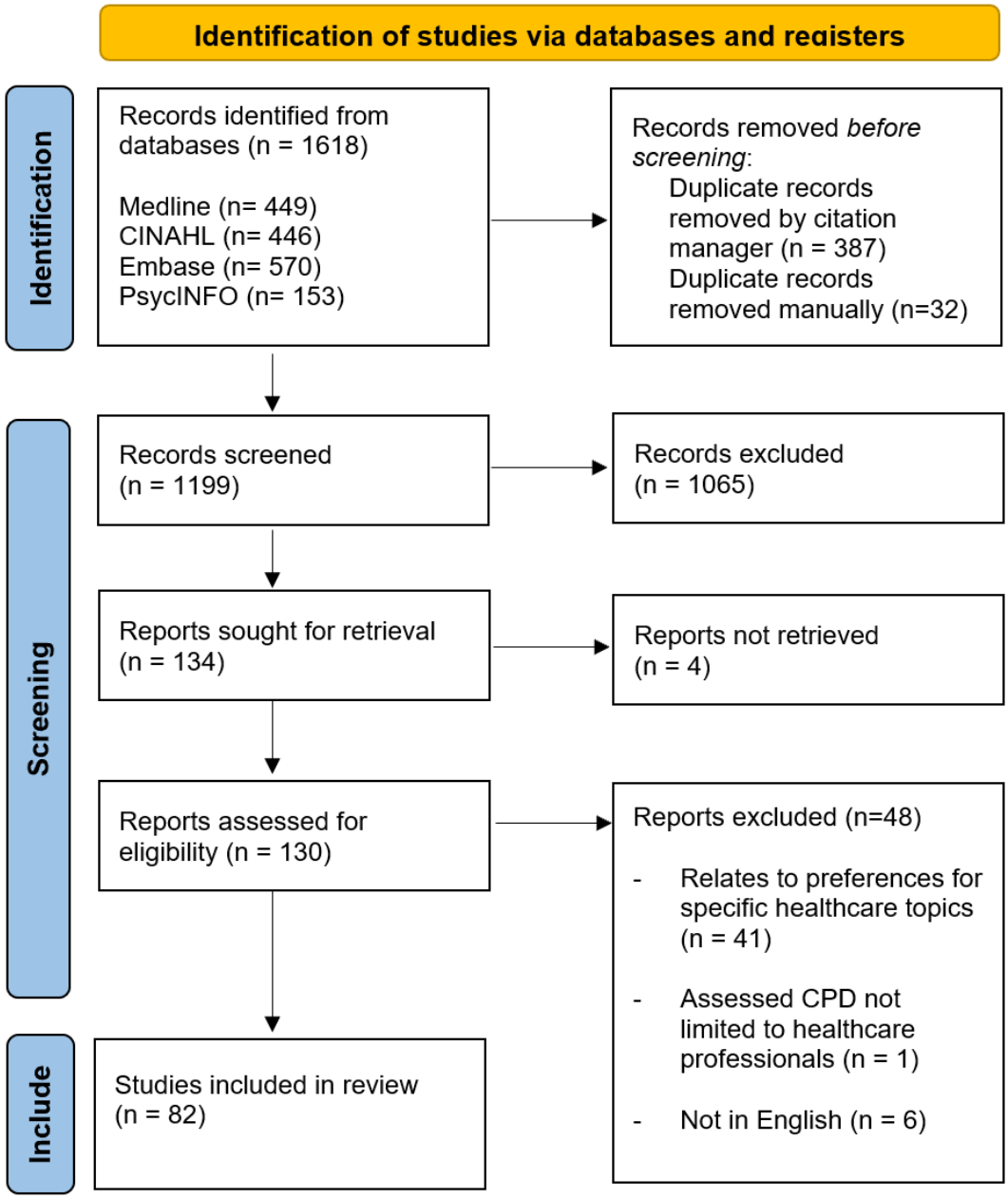
The Joanna-Briggs Institute three-phase search strategy was utilized for this literature review (Peters et al., 2020). Firstly, an initial limited search was conducted on Medline (via Ovid) and CINAHL (via EBSCOhost) using preliminary keywords conceptualized. This included "continuing professional development", "continuing education", "experience", "needs", "facilitators" and "barriers". Relevant medical subject headings were also utilized in conjunction with keywords to widen the breadth of search. As this review sought to understand the participants' CPD experience, needs, facilitators and barriers, database-specific qualitative search filter were utilized. The title, abstract and index terms of the articles retrieved were reviewed to aid the refinement of the existing search strategy. Next, the revised search strategy was undertaken across four databases including Medline (via Ovid), CINAHL (via

EBSCOhost), Embase (via Ovid) and PsycINFO (via Ovid). This CLR included literature published between 2019 and 2024, a decision made to ensure viewpoints obtained are current and relevant. This was also appropriately balanced by the inclusion viewpoints from all health professions. Lastly, the reference lists of the articles selected after full-text review were screened for further additions. The full search strategy is available in Appendix A.

Study Selection

The final search was conducted on 17th January 2024. References were retrieved and exported into the citation manager, Endnote X9 (Clarivate Analytics, 2018). Study duplicates were removed manually and automatically through the associated citation manager function. A first round of screening was performed for the imported articles' title and abstract to ascertain preliminary eligibility. Following that, the remaining articles underwent full-text screening. These screening exercises were guided by screening forms that were created *a-priori* (Appendix B). This ensured that the decision-making process was objective and standardized. Articles were eligible if they (1) involved HCPs, regardless of profession, (2) contained viewpoints related to their CPD experience, needs, facilitators or barriers. The study selection process is outlined by the PRISMA flowchart (Figure 1) (Page et al., 2021).

Figure 1: PRISMA Flowchart



Search Results

A total of 1618 records were retrieved following the comprehensive search of the four databases. Of which, 387 duplicates were removed using the citation manager and 32 records were removed manually. A small number of records were not available for full-text review (n=4). Following full-text screening, records were excluded as they were related to preferences for specific healthcare topics (n=41), did not evaluate only healthcare professionals (n=1). Due to the reviewer's language limitations, studies were also excluded if they were not available in English (n=6). A total of 82 articles were included for this CLR.

Study Characteristics

Of the included literature, there were 25 qualitative studies and 10 mixed-methods studies that provided qualitative data related to the aims of this review. Forty-six quantitative studies were also included as they contained cross-sectional surveys with either (1) a brief open-ended segment which provided valuable qualitative data or (2) questionnaire items that represented valid viewpoints related to CPD experience, needs, facilitators, or barriers. A qualitative systematic review and one literature review were also retrieved from the search (Atreya et al., 2022; Smith et al., 2023). These reviews contained primary studies from beyond the search's duration (before 2019)

and were included as they contributed additional viewpoints related to HCPs' choice of CPD.

Studies came from a variety of locations: Europe (n=26), Canada (n=11), USA (n=11), Middle East (n=11), Asia (n=11), Oceania (n=5), and Africa (n=3). Five studies consist of data obtained from multiple geographical locations. In terms of healthcare professions, the included studies evaluated CPD preferences of a multidisciplinary population (n=11), physicians (n=23), nurses (n=23), pharmacists (n=16), allied health professionals (n=9), and physician assistants (n=1).

Review Findings

This CLR aims to investigate (1) characteristics of specific CPD programs that attract or deter participants, and (2) general factors that motivate or discourage CPD participation. Following analysis, three categories of factors related to HCPs' preferences and needs towards CPD were uncovered. They may be broadly categorized into "Professional needs", "Content, delivery and format" and "Resource factors" (Table 1).

Table 1: Overview of factors affecting CPD choice

Professional Needs	Content, Delivery and Format	Resource Factors
• Sustained competence and development • Clinical relevance and implications • Professional socialization • Workplace culture and support	• Content • Delivery • Format • Others	• Time and workload constraints • Participation costs • Resource issues (equipment/ infrastructure)

Professional Needs

The professional needs of HCPs play an important role in their CPD choice. These needs may be further categorized into the following: “Sustained competence and development”, “Clinical relevance and implications”, “Professional socialization” and “Workplace culture and support”.

Sustained competence and development

A primary motivation for CPD activities is the pursuit of knowledge to improve HCPs' clinical skills and competencies. This motivation has been associated with a desire to provide high quality care and improve patient's outcomes (Puengrung et al., 2020; Reis et al., 2022; Pracilio et al., 2023). A study of CPD attitudes amongst critical nurses using the Questionnaire of Professional Development of Nurses concluded that personal and professional development were amongst the greatest motivators for CPD (Gosselin et al., 2020). An intrinsic acknowledgement that CPD activities can improve clinical skills was also found to improve CPD uptake amongst nurses (Palma et al., 2020). Such sentiment may have arisen from routine clinical encounters that highlighted knowledge gaps or lack of familiarity towards more uncommon conditions (Bridgwood et al., 2022; Ahlquist, 2022). The concept of "knowledge regression" after training completion was also reported, a phenomenon where less commonly utilized knowledge or skillsets were gradually lost with time (Daloglu & Alimoglu, 2020). As such, HCPs appreciated the utility of CPD to refresh knowledge surrounding different practice areas, especially through modalities such as case discussions and problem-based learning (Ahlquist, 2022).

The current age of rapid medical advancements and emphasis on evidence-based practice requires HCPs to stay updated in their field of practice. HCPs frequently participate in CPD activities as they succinctly summarize latest

evidence, guidelines, and innovations within different knowledge areas (Dowling et al., 2020; Lera et al., 2020; Puengrung et al., 2020; Stewart et al., 2020; Undilashvili et al., 2020). Casanova et al. (2022) highlighted its utility within the context of the COVID-19 pandemic, where management and treatment modalities were rapidly evolving with emerging research. The recognition that CPD programs organized by accredited bodies constitute carefully curated, expert-led learning also motivated participation (Harnett et al., 2020; Tarchichi & Szymusiak, 2020; Driver, Lovell & Oprescu, 2021; Flannery et al., 2022). During these programs, HCPs were able to participate in in-depth discussions which allowed them to reflect and evaluate their current practice. This frequently results in practice changes that effectively incorporates evidence-based recommendations, improving clinical care and patient outcomes (Reis et al., 2022; Stevens et al., 2020).

In terms of professional development, HCPs have been known to prefer CPD activities that lead to professional certifications. They undertake short courses to develop specialized skillsets or graduate studies that lead to academic qualification (postgraduate diplomas, master's degree etc) (Day et al., 2021; Mutati et al., 2022; Yu, Huang & Liu, 2022; Al-Kubaisi, Elnour & Sadeq, 2023). Some HCPs also utilize CPD activities to equip themselves with the skills to transit into more specialized roles (Puengrung et al., 2020; Zou et al., 2023).

In regions where CPD is mandated for professional registration, CPD involvement is often recorded in the form of training hours or CPD point

systems (James & Francis, 2011; Ross, 2013). This has also been found to be a significant motivator for CPD involvement. CPD participants often shared that their attendance was driven by the attainment of accredited CPD hours or points (Schindel et al., 2019; Simkhada et al., 2023). Time and workload constraints often prompt HCPs to only select CPD activities that simultaneously meet their learning and accreditation needs (Abuloha et al., 2019).

Clinical relevance and implications

The clinical relevance of CPD activities is another important factor that impacts participation (Abuloha et al., 2019; Cunningham et al., 2019; Paterson & Edmond, 2019; Vova-Chatzi et al., 2019; Wagner et al., 2019). It is important that CPD content offers solutions to the problems HCPs will potentially encounter within their practice setting (Stewart et al., 2020; Jordan et al., 2022). This is not limited to clinical topics. Non-clinical topics related to leadership, communication, change management and administration (navigating regulatory processes, documentation, etc.) have also been reported as critical CPD training areas (Schindel et al., 2019; Dowling et al., 2020; Paterson & Edmond, 2020; Fox et al., 2022; Curran et al., 2023). CPD activities have also expanded to cover topics pertaining to HCPs' mental and spiritual health, with activities directed at helping participants manage their stress, anxiety, and burnout levels in the fast-paced clinical environment (Dowling et al., 2020). Milgrom et al (2022) brought up the hierarchy of training

needs and recommends the evaluation of priority topics to guide CPD organization's planning. HCPs in more niche specialities have also voiced challenges related to finding available and accessible CPD programs that fit their needs (Hanlon et al., 2021). This shows that it is necessary to evaluate contemporary CPD trends when planning for CPD activities.

CPD attendance is frequently associated with a disruption to HCPs' work and personal life. In certain workplaces, HCPs must attend CPD activities outside their work hours (Vova-Chatzi et al., 2019; Jordan et al., 2022). This includes attending CPD activities in the evening or during the weekends. Opinions about this were mixed, with some HCPs favouring such arrangements as they do not have to miss work, could learn in a relaxed environment, and are subjected to minimal distractions (Undilashvili et al., 2020; Gottlieb et al., 2022; Jordan et al., 2022; Reis et al., 2022). Such sentiments were especially common amongst General Practitioners who operate in a single-physician or rural settings (Cunningham et al., 2019; Galvin et al., 2020). Daytime absences would equate to loss of income and the need to find locum physician covers (Reis et., 2022, Ibsen et al., 2023). On the other hand, there were also HCPs who do not view out-of-hours training favourably. Common reasons include physical fatigue after work and disruptions to their personal lives (Dowling et al., 2020; Bridgwood et al., 2022, Flannery et al., 2022, Gottlieb et al., 2022, Hatem et al., 2022). Where possible, paid training leaves, online formats and training arrangements that minimize disruptions and enhance access to training were preferred (Micallef, Huet & Kayyali, 2020;

Tarchichi & Szymusiak, 2020; Xing et al., 2020). Alternate training arrangements like workplace-based CPD activities (in-service training, lunchtime talks) or CPD activities that were offered during events that they were already attending, were also suggested (Abuloha et al., 2019; Vova-Chatzi et al., 2019; Casanova et al., 2022)

Professional Socialization

CPD activities were also viewed as a platform for networking and socialization (Abuloha et al., 2019; Cunningham et al., 2019; Overbay et al., 2021; Stewart et al., 2020, Bridgwood et al., 2022). The social component of learning was an important aspect voiced by the various healthcare disciplines. It has been known to facilitate sharing and discussions on best practices (Micallef, Huet & Kayyali, 2020; Tarchichi & Szymusiak, 2020). Beyond clinical issues, HCPs reportedly utilize it as an avenue for peer support (Lera et al., 2020). Dowling et al (2019b) utilized a small group learning format with great success. Participants appreciated the ability to share difficult circumstances and experiences within their closely-knit professional group. This aspect was especially valued by HCPs who work alone or in more rural vicinities (Stewart et al., 2020; Tarchichi & Szymusiak, 2020; Carroll et al., 2021; Magwenya & Ross, 2021). Beyond the intra-profession dimension, interprofessional nature of CPD activities was also associated with positive outcomes. HCPs enjoyed learning with colleagues from the other healthcare professions as they enriched their learning (Schindel et al., 2019; Harnett et al., 2020; Casanova

et al., 2022; Milgrom et al., 2022). Without interprofessional CPD activities, HCPs found it difficult to access colleagues for support and networking (Carroll et al., 2021). The social component of CPD was so important that participants shared that it allowed them to “refresh professionally”, motivating individuals to participate in more CPD activities (Gottlieb et al., 2022; Yu, Huang & Liu, 2022; Carroll et al., 2021). On the contrary, retiring HCPs whose colleagues have all retired reported declining motivations to participate in CPD activities (Ibsen et al., 2023).

Workplace culture and support

An organization-level determinant of CPD choice is the role of the workplace. Employer recognition was found to be another important factor that affected CPD choice (Vova-Chatzi et al., 2019; Puengrung et al., 2020; Stewart et al., 2020; Carroll et al., 2021). HCPs expressed a preference for CPD activities that contribute to their career progression (Puengrung et al., 2020). This might come in the form of formal education (Postgraduate diploma, Masters’ degree, etc.) or administrative and managerial training (Day et al., 2021; Mutati et al., 2022; Yu, Huang & Liu, 2022; Al-Kubaisi, Elnour & Sadeq, 2023). Employers have also been shown to support CPD endeavours when they align with the organization’s needs, providing reimbursements and other training accommodations like allocated time for training, arranging coverage of clinical duties (Younes et al., 2019; Lorenzoni et al., 2022; Zou et al., 2023). On the other hand, the lack of support dissuades CPD participation (Younes et al.,

2019; Stewart et al., 2020; Haji Mustapa et al., 2021; Magwenya & Ross, 2021).

Content, Delivery and Format

The planning and execution of CPD programs also influence HCPs' CPD choices. Individual learning preferences differ, and this is evident from the rich body of knowledge within health professions education research.

Content

The CPD program's training content is one of the most important factors that influence an individual's choice. As previously discussed, training content should be relevant and contribute to professional development and competence. Despite that, personal interest also plays a crucial role in determining CPD choice (Younes et al., 2019, Micallef, Huet & Kayyali, 2020). A large-scale survey of 856 primary healthcare providers revealed that the learning of "purely interesting topics with limited relevance to their practice" was highly important (Bridgwood et al., 2022). However, this was sometimes impossible due to political, organizational and public directions (Vova-Chatzi et al., 2019). Zou et al (2023) highlighted a unique situation where clinicians in private practices were asked to participate in CPD activities related to sales and marketing of services, instead of clinically relevant topics.

Training on cultural competency was also reported as an important area of CPD. Deep understanding of the practice context and “contextual intelligence” were highly valued traits that HCPs sought to develop (Paterson & Edmond, 2019). Surveyed community pharmacists from UAE reported the need for formal and continuing education to incorporate Arabic-language teaching for a range of topics that includes medication counselling, communication in special situations, and empathetic responding (Hasan et al., 2021)

With the overwhelming range of CPD needs, CPD providers are required to skilfully plan and execute CPD programs. Well-organized, interactive in-person sessions and user-friendly online platforms were amongst the features valued by HCPs (Overbay et al., 2021; Milgrom et al., 2022, Stevens et al., 2020). In terms of volume and complexity, CPD participants were sensitive to the amount and difficulty of the knowledge delivered (Wagner et al., 2019; Pogge & Davis, 2021). CPD activities should be adequately paced to prevent information overload (Connolly et al., 2020; Stevens et al., 2020). HCP professionals frequently found that little meaningful learning occurred when training materials were repetitive or relate to already familiar topics (Aldosari et al., 2020; Stevens et al., 2020). CPD organizations that successfully navigate these areas to provide high quality CPD programs were highly regarded. The reputation and perceived quality of training have been shown to affect future attendance (Julian & Ruiz, 2020; Micallef, Huet & Kayyali, 2020).

Delivery

With regards to CPD delivery, HCPs appreciate training activities that provide a concise summary of the learning topic (Cunningham et al., 2019; Singh et al., 2022; Ibsen et al., 2023). Due to hectic work schedules and high workload, a study of Georgian physicians indicated that they will “readily abandon activities that they view as inefficient” (Undilashivili et al., 2020). There is also a preference for training activities that allowed active discussions (Harnett et al., 2020; Micallef, Huet & Kayyali, 2020; Pogge & Davis, 2021; Kim et al., 2022; Milgrom et al., 2022). This can range from small group case study discussions to the ability to pose questions during seminars and webinars (Cunningham et al., 2019; Barton et al., 2022). Dynamic and engaging learning formats allow HCPs to fully immerse in learning (Harnett et al., 2020; Pogge & Davis, 2021; Gottlieb et al., 2022; Mutati et al., 2022). The ability to seek immediate clarification and feedback during in-person and synchronous online training were also preferred (Stevens et al., 2020).

The profile of CPD presenters or trainers also affected HCPs’ choice. CPD activities delivered by credible specialists or content experts were highly valued (Tarchichi & Szymusiak, 2020; Undilashivili et al., 2020; Patel et al., 2021; Luconi et al., 2022). Such training formats were akin to an informal mentorship exercise (Schindel et al., 2019; Smith et al., 2023). However, HCPs also voiced their preference for local experts from the same profession due to the applicability of knowledge (Mohamed Afif et al., 2021).

The availability of appropriate learning support medium was also an important aspect that shaped CPD participants' learning experience. Prior to CPD activities, HCPs voiced a preference to receive copies of case studies or PowerPoint slides to allow them to prepare for training discussions (Gottlieb et al., 2022; Stevens et al., 2020). Intra-event support in the forms of a multidisciplinary support team and resource library also enhanced the learning experience (Milgrom et al., 2022). After CPD activities, post-event materials like training recordings and summary of discussions were found to be helpful (Micallef & Kayyali, 2022; Fitzgerald et al., 2023).

Format

The overall delivery format is another major determining factor for CPD participation. Learners who have self-directed learning styles often preferred asynchronous learning formats that utilize mediums such as e-learning, journal articles, infographics, or podcasts (Lera et al., 2020; Xing et al., 2020; Flannery et al., 2022; Gottlieb et al., 2022; Stevens et al., 2020). On the other hand, individuals who value a dynamic and interactive learning environment may be inclined to select synchronous formats (Kim et al., 2022; Milgrom et al., 2022).

Studies exploring CPD preferences often evaluate participants' inclination towards either the in-person, online or blended delivery formats. Results were expectedly mixed due to HCPs' personal preferences and learning styles (Undilashvili et al., 2020; Carroll et al., 2021, Flannery et al., 2022; Lorenzoni et al., 2022; Luconi et al., 2022). However, relevant studies reported a majority preference for online formats (Abuloha et al., 2019; Cunningham, 2019; Schindel et al., 2019; Aldosari et al., 2020; Galvin et al., 2020). HCPs who preferred the online format frequently emphasized the benefits of enhanced flexibility and accessibility, which were important to navigate time and workload constraints within the clinical setting (Galvin et al., 2020; Lera et al., 2020; Xing et al., 2020; Casanova et al., 2022; Gottlieb et al., 2022). HCPs also found that online formats were as effective as in-person formats in terms of meeting individual needs, bringing about a sense of community, and promoting in-class communication and participation (Balamurugan et al., 2021). There was also an added dimension of safety as the online formats restricted the spread of COVID-19 (Overbay et al., 2021). However, there were also cautionary viewpoints related to the increased workload brought on by e-learning modalities (Lorenzoni et al., 2022).

HCPs who preferred in-person formats often relate it to the ability to focus and fewer distractions (Gottlieb et al., 2022; Kim et al., 2022; Reis et al., 2022). Blended formats were also recognized to be feasible, conferring beneficial characteristics of both the in-person and online formats (Balamurugan et al., 2021; Day et al., 2021). This is especially true for more

technical topics that will benefit from hands-on sessions (equipment handling, etc.) (Stevens et al., 2020). HCPs were also able to personalize their CPD experience to fit their professional schedules when both formats were available (Hanlon et al., 2021; Tsantili et al., 2021; Gottlieb et al., 2022). There is also a potential age differential when it comes to CPD format preferences. Cunningham et al (2019) reported that younger age profiles (45 years and below) prefer 'direct observation through clinical attachments' and 'podcasts', but older HCPs seem to prefer 'attending a lecture', 'reading' and 'reflecting on their own practice'.

Preference for informal CPD activities conducted during work hours were reported in a number of studies (Gosselin et al., 2020; Puengrung et al., 2020; Stewart et al., 2020; Hanlon et al., 2021; Flannery et al., 2022; Fitzgerald et al., 2023). Workplace learning formats include in-service training, direct observation, clinical attachments, clinical case discussions, and peer learning (Cunningham et al., 2019; Stanley et al., 2021; Hatem et al., 2022; Dale et al., 2023; Ibsen et al., 2023). In some cases, teaching and precepting were verbalized to be important sources of professional development and knowledge acquisition (Schindel et al., 2019). However, within many settings, HCPs profess a lack of recognition despite the merit of such activities (Ibsen et al., 2023). In spite of that, accredited, in-service learning activities (e.g. lunchtime talks, departmental grand rounds) were popular due to their ease of access (Barton et al., 2022; Hatem et al., 2022; Singh et al., 2022). Social media was also used to facilitate CPD, with platforms like Twitter (currently

known as X) providing practice and research updates for busy clinicians (Barton et al., 2022). Moorley & Chinn (2019) mapped specific social media activities to nursing revalidation domains in the United Kingdom. Such an endeavour formalized a CPD structure that enhanced learning accessibility, encouraging nurses to participate in partake in lifelong learning.

Others

In-training experience have been known to influence CPD choice. HCPs mentioned the importance of a safe and non-judgemental learning environment (Xing et al., 2020; Seki et al., 2022; Dowling et al., 2019a; Fitzgerald et al., 2023; Zou et al., 2023). Seki et al (2022) emphasized the need to value and accept diverse viewpoints and learning needs. Such environments provide a positive learning space and encourage active discussions (Fitzgerald et al., 2023; Zou et al., 2023).

The location and length of CPD programs also greatly affect HCPs' choice. In terms of location, HCPs frequently weigh their personal circumstance and resource considerations prior to program registration (Cunningham et al., 2019; Carroll et al., 2021; Ibsen et al., 2023). There was a preference for training programs that were convenient to attend, especially when they occurred outside office hours (Abuloha et al., 2019). This could be in-person programs held in a nearby locations or simply pivoted online (Lera et al., 2020; Tarchichi & Szymusiak, 2020). High training-related expenses (travelling

expenses etc.) were also significant barriers (Alharthi et al., 2021; Simkhada et al., 2023). In terms of CPD activity length, most HCPs prefer sessions that were shorter and concise (Vova-Chatzi et al., 2019; Julian & Ruiz, 2020; Xing et al., 2020; Ibsen et al., 2023). Longer CPD sessions were associated with a loss of focus (Xing et al., 2020).

Limited knowledge of CPD availability also affected CPD uptake (Abuloha et al., 2019; Aldosari et al., 2020; Connolly et al., 2020; Palma et al., 2020; Stewart et al., 2020). HCPs frequently attribute this to a lack of advertisement (Abuloha et al., 2019; Aldosari et al., 2020; Ryan et al., 2021). Scenarios where managers control and gatekeep CPD opportunities were also reported (Undilashvili et al., 2020; Ma et al., 2023). Even when CPD opportunities were communicated, CPD activities were frequently promoted with insufficient notice, making it difficult for HCPs to effectively plan for them (Micallef, Huet & Kayyali, 2020; Carroll et al., 2021; Ibsen et al., 2023).

Lastly, administrative barriers also affected HCPs' CPD choice (Sibbald et al., 2020; Haji Mustapa et al., 2021; Hanlon et al., 2021). HCPs commented on the lack of administrative support and streamlined registration processes (Hanlon et al., 2019; Sibbald et al., 2020). In the study by Hanlon and colleagues (2021), physicians shared institutional rules that prevented them from attending internal CPD activities when they were on special statuses (e.g. maternity leave), with no further assistance to achieve their required CPD hours.

Resource Factors

CPD participation requires significant amounts of resources that either come out-of-pocket or provided by employers. HCPs' resource needs frequently relate to participation costs, and technological constraints. These will be discussed in detail within the following section.

Participation costs

HCPs were often concerned about costs related to CPD participation (Kafadar et al., 2019; Vova-Chatzi et al., 2019; Aldosari et al., 2020; Galvin et al., 2020; Gosselin et al., 2020). Many HCPs shared highly practical sentiments that monetary concerns directly affected their CPD attendance (Abuloha et al., 2019; Schindel et al., 2019; Younes et al., 2019; Hijazeen et al., 2023; Smith et al., 2023). CPD attendance cost was cited, especially when travel and accommodation expenses were considered (Alharthi et al., 2021; Carroll et al., 2021; Hawkins, Ehsan & Burkitt, 2023; Simkhada et al., 2023). Concerns were raised by General Practitioners who needed to pay for locum covers when they were away for CPD activities (Dowling et al., 2020; Reis et al., 2022; Ibsen et al., 2023). Also, many HCPs preferred CPD training that are paid by their employers (Vova-Chatzi et al., 2019; Gosselin et al., 2020; Stewart et al., 2020; Fitzgerald et al., 2023).

Technology and infrastructure

This resource concern relates primarily to online formats of CPD. Issues highlighted were commonly related to the technological infrastructure. The lack of access to high-speed internet services prevented some HCPs from accessing synchronous contents (Stevens et al., 2020; Hanlon et al., 2021; Patel et al., 2021). Platform issues that restricted access were also reported (e.g. login issues, technical glitches) (Overbay et al., 2021; Gottlieb et al., 2022). Unforeseen equipment malfunctions also sometimes result in poor audio and visual quality (Stevens et al., 2020). Digital competencies were also brought up by HCPs who were not familiar with new computer systems and interface (Xing et al., 2020; Reis et al., 2022).

Chapter 3: Methods

This chapter provides a methodological overview that includes (1) a description of and justification for the use of Q-methodology, (2) a summary of the study scope (setting and eligibility criteria), (3) an outline of this Q-methodology study's planning, data collection and data analysis phases.

Q-methodology overview

Q-methodology is a qualitative-quantitative methodology that is useful for the identification of shared and alternate viewpoints on a specified research topic (Watts & Stenner, 2012). Q-methodology consists of three phases – planning (Q-sample generation), data collection (Q-sort exercise), and data analysis (Q-factor analysis) (McKeown & Thomas, 2013).

In the planning phase (Q-sample generation), relevant viewpoints towards a central topic are extracted from existing literature and survey of the population of interest. This concourse of viewpoints is then subjected to expert review to formulate a final list of statements known as the Q-sample.

In the data collection phase (Q-sort exercise), study participants are required to arrange the Q-sample statements within a Q-methodology sorting (Q-sort) table based on their experience and perceptions of the central topic. This rank-ordering exercise compels them to reflect deeply and model their

viewpoints onto the Q-sort matrix (Brown, Danielson & van Exel, 2015; McKeown & Thomas, 2013). As part of the data collection process, participants are also required to share the reasons for ranking statements on the most extreme poles of the Q-sort matrix.

In the data analysis phase (Q-factor analysis), individual Q-sorts are compared with every other Q-sorts to produce an initial correlation matrix. These datasets are subjected to factor extraction and rotation, statistical techniques that allow the loading of participants into groups called factors. Factors represent contextual interpretations that summarize complementary and dissenting sentiments (Webler, Danielson & Tuler, 2009; Watts & Stenner, 2012; McKeown & Thomas, 2013). Participants loaded onto the same factor would have made similar decisions during the Q-sort exercise. Thereafter, the selected factors are interpreted using abductive reasoning, considering the distinguishing statements' scores and positions within the factor array (Watts & Stenner, 2012; McKeown & Thomas, 2013). Distinguishing statements may be defined as statements that scored on a factor in a significantly different manner when compared to its scores on other factors, exemplifying a factor's unique characteristics (Akhtar-Danesh, Baumann & Cordingley, 2008). Different permutations of the Q-sorts allow salient viewpoints to manifest, unveiling deeper insights towards the central topic. Qualitative data collected during the Q-sort exercise may be used to supplement the researchers' interpretation. Finally, consensus statements represent positive, negative or neutral viewpoints that do not significantly differ across the different factors

(Brown, 1980). These statements also facilitate the factor interpretation and labelling process.

Proponents and critics

Q-methodology confers several benefits to researchers seeking to understand human behaviour. It can elicit comprehensive and in-depth understanding of a phenomenon using a relatively small sample (McKeown & Thomas, 2013). Q-methodology research typically features 40-60 participants, a number appropriate due to the methodology's aim of exploring "subjective operants" instead of making statistical inferences (Watts & Stenner, 2012; Brown 1980). This is particularly advantageous in highly specific contexts that are characterized by small sampling frames (Hensel, Cooper & Craney, 2018). This research methodology is also able to capture minority viewpoints through inherent features such as a comprehensive Q-sample generation (Slaughter et al., 2024).

Despite its similarity to mixed methods research, Q-methodology does not subscribe to the conventional subtypes such as: convergent, explanatory-sequential, or exploratory-sequential designs (Ramlo & Newman, 2011). Instead, it is a unique blend of qualitative and quantitative methodologies that leverages on the qualities of both research frameworks. It involves both qualitative data in the form of the concourse and Q-sample statements, and quantitative data produced by robust statistical analyses (Ramlo & Newman,

2011). Generated factors and their associated distinguishing statements are also interpreted in a thematic manner to evoke deeper understanding. The further use of qualitative data (linked to the highest and lowest ranked statements) to triangulate data sources also enhances the credibility of Q-methodology's findings (Watts & Stenner, 2005).

Q-methodology also promotes participant introspection and reflection to elicit diverse viewpoints. This is evident through the Q-sort process, an activity steeped in the constructivist research paradigm (Wolf, 2009). The Q-sample represents a comprehensive and diverse list of viewpoints related to the central topic. When presented with the Q-sample, participants connect with viewpoints they inherently held. However, they naturally develop meaning towards new perspectives presented to them, constructing new perceptions towards the central issues. The Q-methodology process then requires participants to transcribe their thoughts during a single rank-order sorting exercise. In complex societal issues with polarizing sentiments, this constructivist process and the use of a quasi-normal force sort allow differing degrees of agreement and disagreement to emerge, enhancing understanding towards the research topic (Brown, Danielson & van Exel, 2015; Farrimond, 2017).

On the other hand, Q-methodology has also been subjected to scrutiny by methodology purists. Methodological concerns include restrictiveness of finite Q-sample, forced sorting, unstructured factor interpretation, departure from

traditional exploratory factor analysis and validity concerns (Kampen & Tamás, 2014). These concerns were addressed within the editorial reply provided by Brown, Danielson and van Exel (2015). However, several considerations are important within the context of this study. Concerns related to the finite concourse were acknowledged but rebutted with the concept of contextual limits and administrative benefits (manageable data collection process etc.) (Stephenson, 1986; Brown, Danielson & van Exel, 2015). Instead of a formal qualitative inquiry, this study utilized a comprehensive literature review, consisting of literature published between 2019 and 2024, to obtain information related to CPD choice. These were study design decisions that potentially contribute to a finite concourse. However, this was acknowledged as a limitation related to a master's degree thesis that is not associated with any funding. Concerns related to a variable factor interpretation process also led to the use of a detailed factor interpretation guide (Watts & Stenner 2012). This allowed researchers to navigate the data analysis stage in a standardized manner

All in all, Q-methodology is a valuable research methodology with growing use spanning many disciplines like psychology, education, sociology, healthcare and public health (Dziopa & Ahern, 2011; Churruca et al., 2021). Contemporary researchers should seek to understand the methodology's assertions and decide if it fits the needs of their research endeavours.

Appropriateness of Q-methodology

Q-methodology is appropriate for health research that explores subjective experiences like “attitudes, feelings, values, life experiences, role concept, and intra-individual concerns” (Akhtar-Danesh, Baumann & Cordingley, 2008). Factors affecting health professions education and training are multifaceted and can be influenced by the exploration of the aforementioned domains. As such, this methodology has enjoyed much success in recent applications to health professions education (HPE) research (Akhtar-Danesh et al., 2023; Oliveira et al., 2024).

As examined in the previous chapter (Chapter 2), numerous research related to preferences and choice of Continuing Professional Development (CPD) activities have been published in the last five years. Quantitative studies frequently required participants to rank their CPD preferences via a Likert scale (Younes et al., 2019; Dowling et al., 2020; Hawkins, Ehsan & Burkitt, 2023; Al-Kubaisi, Elnour & Sadeq, 2023). These studies typically aggregated survey results and focused on items with the highest scores. On the other hand, qualitative studies that allowed an open inquiry into HCPs’ experiences with CPD, were also conducted (Driver, Lovell & Oprescu, 2021; Flannery et al., 2022; Yu, Huang & Liu, 2022). Thematic analyses allowed HPE researchers gain a deeper understanding of the underlying factors affecting CPD preferences. Existing mixed-method studies utilized a convergent design

to corroborate multiple sources of information (Schindel et al., 2019; Galvin et al., 2020; Micallef, Huet & Kayyali, 2020)

Interestingly, HPE researchers who utilized more novel research methodologies (Delphi process, exploratory factor analysis) were able to unveil less common viewpoints such as systemic barriers and intra-disciplinary dynamics (Vova-Chatzi et al., 2019; Lera et al., 2020). Q-methodology was chosen for this thesis research study for its propensity to provide an alternate angle, enhancing the current understanding towards CPD preferences and needs. To date, this research methodology has not been utilized in the inquiry of healthcare CPD preferences and needs.

Study design

This study employed a cross-sectional, Q-methodology study to investigate HCPs' viewpoints towards CPD. It is conducted by NN, a Master's-level graduate student at McMaster University's Department of Health Research Methods, Evidence and Impact. NN is under the guidance of a thesis committee (NAD, RC & EB) that oversaw and supported him in the various research processes.

Study setting

McMaster University's Continuing Professional Development Office (MacCPD) (Hamilton, Ontario, Canada) supports the development of HCPs and university faculty by providing training in clinical care, health sciences education, leadership, and research. Through the COVID-19 pandemic, MacCPD also ensured ongoing high quality educational activities for a variety of health professionals through the adoption of digital and blended-learning modalities. Participants who have attended CPD programs organized by MacCPD made up the sampling frame. MacCPD retains the contact information of former CPD program local and international participants who have consented to receive information about future MacCPD offerings and CPD-related activities. Its electronic mailing list consists of approximately 25,000 HCPs from various professions, ranging from (but not limited to) the professions of medicine, nursing, allied health, and pharmacy.

Inclusion and exclusion criteria

Individuals were eligible to participate in this study if they (1) were a healthcare professional regardless of profession, (2) have at least one year of experience in their specified healthcare profession, (3) were involved in CPD activities over the past one year, (4) were able to read and comprehend the English language. The professional experience criterion was a study team decision to ensure that recruited participants had sufficient CPD experience to

allow adequate reflection. Individuals were excluded if they were undergoing training as a student of the various healthcare disciplines.

Sample size

Q-methodology aims to highlight key viewpoints through a by-person factor analysis model. For this model, a large sample size is not required as it has been shown to confer limited value (Watts & Stenner, 2012). Q-methodology studies typically recruit 40 to 60 participants, which will sufficiently fill each of the identified factor with a minimum of two participants (Brown, 1980; Watts & Stenner, 2005). However, the final number of extracted factors was based on the principle of maximum variability, and the study team's assessment of substantive meaning and significance (Watts & Stenner 2012).

Ethical considerations

This research study has been reviewed and obtained approval from the Hamilton Integrated Research Ethics Board, under the project number 17320. As this study involves minimal risk with no need to identify the participant for future follow-ups, agreement to complete baseline demographic data and participate in the Q-sort exercise will imply consent.

Data collection and analysis

Recruitment materials, comprising a letter or information (Appendix C) and recruitment flyer (Appendix D), were disseminated via email. The study processes corresponding to the three phases of Q-methodology will be outlined in the upcoming sections.

Planning phase: Q-sample generation

For Q-sample generation, NN began by working on a concourse, a set of statements that reflects the entire range of viewpoints pertaining to the study scope. Various sources were consulted to develop the concourse including: population surveys and existing literature. This study was interested to explore the viewpoints that reflect CPD preferences and needs, namely (1) Characteristics of specific CPD programs that attract or deter participants, (2) General factors that motivate or discourage CPD participation. To achieve this, a sample of evaluation data from CPD programs organized by MacCPD between October and November 2023 was reviewed to generate a preliminary concourse. The MacCPD data was obtained as part of routine, departmental program evaluation via anonymous surveys. RC granted NN access to this data in her capacity as a MacCPD senior administrator. In total, the evaluation data for 692 participants were analysed. This list was further supplemented by existing literature that studied healthcare professionals' CPD preferences and needs. Following that, NN and his thesis committee (NAD, RC & EB)

convened to review the statements. This promotes content validity by providing an opportunity for the clarification, rewording, addition and removal of statements. This session is moderated by a CPD expert (RC) and a health professions education research expert (EB). NAD contributed his Q-methodology expertise and ensured that amendments were purely for clarity and consistency. This maintained the statements' integrity by assuring that the revisions embodied the original form's meaning and intentions. The finalized, representative list of 40 statements (known as Q-sample) is available in Table 2.

Table 2: Q-sample Statements

Professional Needs	
S1	I use CPD to refresh my knowledge on topics that I have lost touch with
S2	I use CPD to stay updated in my field of practice
S3	I will participate in CPD activities that focus on application to clinical practice
S4	I use CPD as a mental health or spiritual resource (to manage my stress, burnout levels etc)
S5	I am interested in non-clinical CPD topics (how to navigate regulatory processes, leadership etc)
S6	I will attend CPD activities that are relevant to my practice and meet the needs of my clinical role
S7	It is important that CPD programs are convenient and do not disrupt my personal and professional schedules
S8	I view CPD as a platform for networking, socializing and collaborative learning within my profession
S9	I enjoy the interprofessional learning and collaboration opportunities that are possible through CPD
S10	I participate in CPD as my employers recognize my efforts and count it towards my overall performance and career progression
S11	I participate in CPD to meet the requirements for license renewal
S12	I participate in CPD to refresh professionally and stay motivated

S13	I take part in CPD to become more skilled and competent in what I do
S14	I participate in CPD activities to attain professional certifications (Short courses, Postgraduate diploma, Master's degree)
S15	I am interested in CPD activities that help me with role transition
Content, Delivery and Format	
S16	I value the autonomy to select my own CPD activities
S17	The overall CPD delivery format is important to me (online, in-person, blended)
S18	I prefer CPD formats that allow me to access content in my own time and pace
S19	I find that informal CPD activities that occur during work are important sources of learning (Teaching and precepting, clinical shadowing, case discussions etc)
S20	It is important that CPD programs are engaging and interactive
S21	The profile of speakers/trainers influences my CPD choice
S22	I will attend CPD if the organizing body has a good reputation
S23	I am drawn to high quality CPD programs that are well-organized, designed and delivered
S24	I believe that social media should be used to enhance learning in CPD
S25	I believe that CPD activities should be culturally competent (cultural sensitivity, cater to patient's language needs)

S26	I think CPD activities should provide a concise summary of knowledge
S27	I think that CPD activities should have appropriate difficulty and volume of content
S28	I would like to personalize my CPD learning experience within a program
S29	I prefer CPD programs that provide appropriate learning support mediums (Pre/post-activity PowerPoint slides, Summary of discussions)
S30	Burdensome administrative processes affect my CPD participation (Registration, setup, recording participation hours)
S31	I feel that CPD activities on familiar topics do not result in meaningful learning
S32	The location of CPD training affects my choice
S33	The length of CPD programs affects my choice
S34	I have difficulties knowing the availability of and planning for CPD activities
S35	I prefer to learn in a safe and non-judgemental learning environment
S36	I will choose CPD offerings that highlight equity, diversity and inclusion dimensions
S37	I prefer CPD activities that provide a program outline and clear objectives which are met by the end of the session

S38	My CPD experience is affected when I perceive biases and conflict of interests in the activity content
Resource Factors	
S39	I am concerned about the costs related to CPD participation
S40	I am concerned about technical issues (general/equipment/ infrastructure-related) that affect my CPD access and experience

Data collection phase: Demographic data and Q-sort exercise

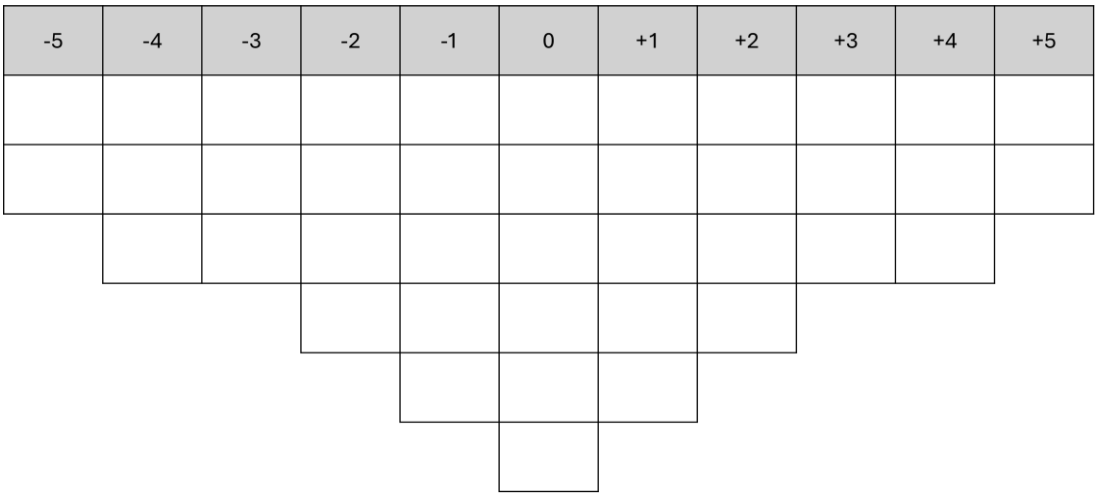
Recruited participants were required to complete a demographic survey and Q-sort exercise. For the demographic survey, only important characteristics required for analysis were requested from the recruited participants via Microsoft Forms (Appendix E). This includes information related to the eligibility criteria, country of practice, primary profession, age, and years of experience in specified profession. Strict access control was applied to the data collected. The data collection platform (Microsoft Forms) was set up to only allow access to NN, NAD, RC and EB via their respective McMaster University email. All individuals involved in this research study were reminded of the study data's confidential nature and were not allowed to share it beyond the scope of this study.

For the Q-sort exercise, study participants sorted the 40 Q-sample statements within a Q-sort table. They were instructed to reflect on their CPD preferences and needs, and rank the statements based on how much they agreed or disagreed with them. The Q-sort table allowed the ranking of statements from strongly agree (i.e. +5) to strongly disagree (i.e. -5). A limit on the number of statements at each level allows the Q-sample to assume an approximate normal distribution following the sorting process. The resulting distribution also reflected the participant's disposition, allowing appropriate analysis of patterns and inter-statement relationships with respect to their allotted Q-sort positions (Watts & Stenner, 2012). The Q-sort table used in this study is provided in

Figure 2. Assignment of the Q-sample statements into the Q-sort table were pilot tested with potential participants and study team members to ensure content and face validity.

HtmlQ, a project management application was used to rank statements for Q-methodology studies (htmlQ, open-source). Anonymity was ensured as no demographic data or participant identifiers were uploaded or processed here. However, as there was a need to link the demographic data to the Q-sort response, a unique participant code (UPC) was generated based on a specified formula (Appendix E). The UPC was generated in the demographic survey and participants were instructed to enter the same UPC for the subsequent Q-sort exercise.

Figure 2: Q-sort Table



Analysis phase: Q-factor analysis

The qfactor program in Stata was used for data analysis (Akhtar-Danesh, 2018a). A by-person factor analysis with principal component factor extraction and varimax rotation was conducted (Brown, 1980). Participants with similar viewpoints towards CPD were placed into groups called factors. The distinguishing statements were identified with a Cohen effect size of 0.80 (Akhtar-Danesh, 2018b). Watts and Stenner (2012)'s interpretation guide was used to interpret and label the emerged factors. The guide proposed a consistent method of interpretation by (1) considering distinguishing statements that are ranked the highest (+5) and lowest (-5), (2) identifying other distinguishing statements that are ranked highest or lowest across all factors, and (3) applying abductive reasoning to summarize the sentiments reflected within the distinguishing statements scores and relative positions. Finally, consensus statements were similarly-ranked viewpoints that did not emerge as distinguishing statements in any of the identified factors (Akhtar-Danesh, 2018b).

Chapter 4: Results

Within this chapter, CPD attributes that attract or deter HCPs from participation were analysed and categorized into factors. Narrative data recruited during the Q-sort exercise were also utilized to supplement the findings.

Participants

The demographic data of the 47 study participants are presented in Table 3 This study consists of participants from a wide variety of occupations and ages. Participants had an average of 17.8 years of experience within their indicated primary profession. In terms of geographical distribution, majority of the study participants practiced within Ontario, Canada.

By-person factor analysis

The 47 Q-sorts underwent principal component factor extraction and varimax rotation via the qfactor program in Stata (Akhtar-Danesh, 2018a; Brown, 1980). The assessment of item loadings, distinguishing statements, and the collective CPD experience and expertise of the study team were utilized for factor interpretation. Several rounds of factor analysis were conducted by the study team. Following study team discussions, a four-factor model that

accounted for 49.1% of the total variance was deemed the most appropriate for this dataset.

Table 3: Demographic characteristics[1]

Demographic Characteristic	**n (%)**
Age	
Below 30 years	3 (6.5)
30 to 39 years	13 (28.3)
40 to 49 years	11 (23.9)
50 to 59 years	13 (28.3)
60 years and above	6 (13.0)
Experience, in years	17.8
Occupation	
Family Practitioner	10 (21.7)
MD-Specialist/Resident	6 (13.1)
Nurse/Nurse Practitioner	9 (19.6)
Pharmacist	2 (4.3)
Physiotherapist/Occupational Therapists	8 (17.4)
Others	11 (23.9)
Location of practice	
Within Ontario, Canada	38 (82.6)
Outside Ontario, Canada	8 (17.4)

[1] All demographic data was not available for one participant. Additionally, data related to practice location was missing for one other participant

Factor interpretation

The factor interpretations were based on the distinguishing statements (Table 4 – 7). The overall factor scores and narrative data provided by the participants are available in Appendix F and G, respectively. The resulting factors were named, “Value and productivity-focused clinicians”, “Application and competency-based learners”, “Respite seekers”, and “Growth-oriented professionals”. A description of each factor is provided in the following sections.

Factor 1: Value and productivity-focused clinicians

Sixteen participants loaded onto Factor 1, accounting for 15.4% of the total variance. In terms of occupation, these participants were mainly physicians (n=9) and allied health professionals (n=5). The remaining participants included a pharmacist (n=1) and health researcher (n=1). No nurses loaded onto this factor. Most participants were between 30 to 59 years of age (n=12). The average experience level was 15.7 years. The distinguishing statements are presented in Table 4.

A major theme within this factor was a desire for convenience and flexibility. The participants prioritized CPD activities that were in an accessible location (S32, +4), allowed flexibility of completion (S18, +5), and were not excessive in length (S33, +3). The associated narrative data linked this sentiment to heavy clinical workloads and the consequences of work absences.

"Flexibility is key for a busy clinician who does not have time during the working day for professional education" (DB22A)

"Taking time away from work has financial implications and challenges finding coverage/catching up upon return." (AB15M)

Participants were also in-favour of more accessible formats due to reasons such as a lack of vacation days and the costs related to travel and accommodation. Participants were also less in favour of the use of social media (S24, -4) and mental health-related contents (S4, -5). They also strongly disagreed that their choice of CPD activities was influenced by employment-related considerations like career progression (S10, -5).

Despite the emphasis on productivity, the statements related to CPD programs' delivery and format were also highly ranked. Participants were drawn to CPD programs that were perceived to be high quality, well-organized and designed (S23, +4). This reflected the participant's unwillingness to compromise their learning experience despite their proclivity for flexibility and

convenience. Participants artfully consolidated the above viewpoints by sharing their preference for CPD opportunities that were “high yield” or “value for money”.

“Has to be high yield and translate directly into improvements for my role otherwise (it) is not worth the time/money to take time away from personal and professional responsibilities to attend” (AB15M)

“I have very little vacation time and money and I want to ensure the CPD I attend is high quality and value for the money.” (EB20M)

However, the definitions and standards for “high quality training” appeared to differ based on the HCPs’ learning styles and needs. As such, these participants valued their autonomy to choose CPD training that best fit their needs (S16, +4).

“I find many CPD activities can be a waste of time and too basic at this point in my practice and find it more helpful to take something is a bit more intensive.” (TG03A)

Table 4: Distinguishing statements for Factor 1

No.	Statement	F1	F2	F3	F4
S18	I prefer CPD formats that allow me to access content in my own time and pace	+5	-4	-3	0
S16	I value the autonomy to select my own CPD activities	+4	0	0	-1
S23	I am drawn to high quality CPD programs that are well-organized, designed and delivered	+4	+1	+1	+2
S32	The location of CPD training affects my choice	+4	-1	0	0
S33	The length of CPD programs affects my choice	+3	-2	-1	-2
S25	I believe that CPD activities should be culturally competent (cultural sensitivity, cater to patient's language needs)	+2	-5	+5	-4
S31	I feel that CPD activities on familiar topics do not result in meaningful learning	0	-3	-4	-4
S36	I will choose CPD offerings that highlight equity, diversity and inclusion dimensions	0	-5	+5	-3
S5	I am interested in non-clinical CPD topics (how to navigate regulatory processes, leadership etc)	-1	-4	+2	+5
S14	I participate in CPD activities to attain professional certifications (Short courses, Postgraduate diploma, Master's degree)	-3	+1	-4	+3

S12	I participate in CPD to refresh professionally and stay motivated	-3	+2	+4	+3
S21	The profile of speakers/trainers influences my CPD choice	-4	0	0	+1
S24	I believe that social media should be used to enhance learning in CPD	-4	-2	-2	0
S4	I use CPD as a mental health or spiritual resource (to manage my stress, burnout levels etc)	-5	-2	+4	-2
S10	I participate in CPD as my employers recognize my efforts and count it towards my overall performance and career progression	-5	-1	-3	-1

Factor 2: Application and competency-based learners

Ten participants loaded onto Factor 2, accounting for 14.4% of the total variance. There was an approximately even distribution of occupations and age. This factor consisted of participants from medicine (n=4), nursing (n=2), pharmacy (n=1), occupational therapy (n=1), chiropractic practice (n=1) and kinesiology (n=1). In terms of age, there were one to three participants in each age category, with the exception of the “40 to 49 years” group that did not contain any participants. Factor 2 participants had the highest average years of experience at 22.2 years. The distinguishing statements are presented in Table 5.

Within this factor, there was a focus on gaining the clinical skillsets that were relevant and applicable to the participant’s clinical practice and role (S3, +4; S6, +4). CPD activities were also means to access updates within their field of practice (S2, +5). The narrative feedback linked these viewpoints to an emphasis on practice competency. The participants expressed intrinsic (need for regular knowledge and updates) or extrinsic (license renewal) motivations to stay clinically competent.

“As a certified (occupation redacted) I need regular continuing ed (Education)” (KT04A)

“Mandatory regulation is the main reason for selecting one program over another in terms of "density" of MainPro Credits earned” (AX25M)

However, this seems to be limited to technical skills as the following types and aspects of CPD activities were ranked lower: non-clinical CPD activities (S5, -4), equity, diversity and inclusion (EDI) dimensions (S36, -5). A viewpoint that CPD activities should be strictly reserved for topics directly associated with work was also shared.

“(On using CPD as a mental health resource) I use hobbies and reading and exercise for that purpose. CPD is part of work.” (EL3M)

Table 5: Distinguishing statements for Factor 2

No.	Statement	F1	F2	F3	F4
S2	I use CPD to stay updated in my field of practice	-2	+5	+2	-1
S6	I will attend CPD activities that are relevant to my practice and meet the needs of my clinical role	+2	+4	+2	-5
S3	I will participate in CPD activities that focus on application to clinical practice	+1	+4	+1	-5
S11	I participate in CPD to meet the requirements for license renewal	-1	+3	0	-3
S14	I participate in CPD activities to attain professional certifications (Short courses, Postgraduate diploma, Master's degree)	-3	+1	-4	+3
S5	I am interested in non-clinical CPD topics (how to navigate regulatory processes, leadership etc)	-1	-4	+2	+5
S36	I will choose CPD offerings that highlight equity, diversity and inclusion dimensions	0	-5	+5	-3

Factor 3: Respite seekers

Ten participants loaded onto Factor 3, accounting for 13.1% of the total variance. There was a larger proportion of nurses (n=3) and physician assistants (n=3) in this group. The remaining participants included a physician (n=1), dietician (n=1), music therapist (n=1), and psychologist (n=1). This group also featured a younger population with half of its participants between the age of 30 to 39 years. The participants had an average of 16.1 years of experience within their reported profession. The distinguishing statements are presented in Table 6.

These participants viewed CPD as a mental health and spiritual resource (S4, +4). This was because CPD allowed them to take regular breaks from their professional routine, especially when work gets stressful. Participants also attributed CPD to “fun” and “enjoyment”.

“I find learning highly refreshing. When I notice I am struggling I make sure that I find some CPD to engage in. I also know that it s me to have a few more substantial (CPD activities) spread throughout the year so that I have something coming up that is for me.” (BM02A)

“It’s a break from patients - feeds my educational side to give my "teaching" side a rest & learning can be fun.” (LA06A)

This was done through a pursuit of training topics that were more interpersonal in nature. This includes topics associated with culturally competent care (S25, +5) and EDI dimensions (S36, +5). These preferences were in contrast with the Factor 2 array. For participants within this factor, CPD programs did not need to confer professional certifications (S14, -4) They also did not mind burdensome administrative processes (S30, -4) and disruption to their personal or professional schedules (S7, -3) if a CPD program meets their needs.

Despite the pursuit of reprieve from their clinical practice, there was a simultaneous prioritization of CPD topics that were relevant to their clinical contexts. Although ranked lower within the factor array, participants within Factor 3 also wished to participate in training that allows them stay updated within their scope of practice (S2, +2).

Table 6: Distinguishing statements for Factor 3

No.	Statement	F1	F2	F3	F4
S25	I believe that CPD activities should be culturally competent (cultural sensitivity, cater to patient's language needs)	+2	-5	+5	-4
S36	I will choose CPD offerings that highlight equity, diversity and inclusion dimensions	0	-5	+5	-3
S38	My CPD experience is affected when I perceive biases and conflict of interests in the activity content	-1	-1	+4	-4
S4	I use CPD as a mental health or spiritual resource (to manage my stress, burnout levels etc)	-5	-2	+4	-2
S2	I use CPD to stay updated in my field of practice	-2	+5	+2	-1
S5	I am interested in non-clinical CPD topics (how to navigate regulatory processes, leadership etc)	-1	-4	+2	+5
S26	I think CPD activities should provide a concise summary of knowledge	+3	+3	-2	+2
S29	I prefer CPD programs that provide appropriate learning support mediums (Pre/post-activity PowerPoint slides, Summary of discussions)	+1	+1	-2	+1

S7	It is important that CPD programs are convenient and do not disrupt my personal and professional schedule	+3	+1	-3	+1
S14	I participate in CPD activities to attain professional certifications (Short courses, Postgraduate diploma, Master's degree)	-3	+1	-4	+3
S30	Burdensome administrative processes affect my CPD participation (Registration, setup, recording participation hours)	0	0	-4	-1
S34	I have difficulties knowing the availability of and planning for CPD activities	-1	-3	-5	-2

Factor 4: Growth-oriented professionals

Three participants loaded onto Factor 4, accounting for 6.2% of the total variance. One of the participants did not provide any demographic data. The remaining demographic dataset consisted of one nurse and one nurse practitioner. They were between 40 to 59 years of age and had an average experience of 11.5 years within their reported profession. The distinguishing statements are presented in Table 7.

The ability to gain non-clinical expertise that were potentially different from their current skillset was highly important to the participants (S5, +5). However, they were not interested in skillsets that were relevant or applicable to their current role (S3, -5; S6, -5). There was also an inclination towards skillsets that would enable role transition (S15, +4) over those that contributes to license renewal (S11, -3). The ability to attain professional certifications that were recognized and transferrable to different work settings were also important (S14, +3).

Table 7: Distinguishing statements for Factor 4

No.	Statement	F1	F2	F3	F4
S5	I am interested in non-clinical CPD topics (how to navigate regulatory processes, leadership etc)	-1	-4	+2	+5
S15	I am interested in CPD activities that help me with role transition	-2	0	-2	+4
S14	I participate in CPD activities to attain professional certifications (Short courses, Postgraduate diploma, Master's degree)	-3	+1	-4	+3
S18	I prefer CPD formats that allow me to access content in my own time and pace	+5	-4	-3	0
S11	I participate in CPD to meet the requirements for license renewal	-1	+3	0	-3
S36	I will choose CPD offerings that highlight equity, diversity and inclusion dimensions	0	-5	+5	-3
S6	I will attend CPD activities that are relevant to my practice and meet the needs of my clinical role	+2	+4	+2	-5
S3	I will participate in CPD activities that focus on application to clinical practice	+1	+4	+1	-5

Consensus statement

Only one consensus statement was identified through the factor analysis (Table 8). There is a neutral and positive leaning consensus that CPD activities should be designed with appropriate difficulty.

Table 8: Consensus statement

No.	Statement	F1	F2	F3	F4
S27	I think that CPD activities should have appropriate difficulty and volume of content	+1	0	+1	0

Chapter 5: Discussion

This chapter builds on the study's findings by exploring the concepts and nuances within and across each of the identified factor. The implications and recommendations for CPD were also discussed. This section concludes with an examination of this study's strengths and weaknesses.

Summary of findings and key concepts

Q-methodology allowed the study of subjectivity that surrounds HCPs' CPD preferences and needs. The dataset arose from a single Canadian CPD centre (MacCPD), serving participants from predominantly the same geographical area (Ontario, Canada). This provides a snapshot of the HCPs' views towards CPD within the region. Four factors constructed from different permutations of learning priorities, preferences and needs emerged. They represent viewpoints that HCPs held with regards to the pursuit of CPD during a post-pandemic period.

An evaluation of the distinguishing statements across factors allowed the discovery of two major intersecting concepts influencing CPD choice – "CPD content" and "career outlook". Participants loaded onto the four factors had differing content needs. Participants loaded onto Factor 2 were focused on gaining core competencies and skills that would allow them to improve their practice, while participants in Factor 3 and 4 were more interested in training

involving non-technical topics. Despite the similarities of participants in Factor 3 and 4, differences in the eventual CPD choices may be explained by their dissimilar career outlook. In Factor 4, participants' choices were planned around growth and role transition. This resulted in the prioritization of CPD activities that conferred non-clinical expertise (S5, +5). Positive sentiments towards the use of CPD for interprofessional learning (S9, +2) and networking opportunities (S8, +2) also reflected their intentions to transit from their current role. On the other hand, participants in Factor 3 preferred CPD activities that afforded them a break from their professional duties but were less concerned about its use for role transition (S15, -2).

The concept of career outlook may also be used to evaluate participants in Factor 2. Despite their enthusiasm towards enhancing clinical competencies, an abductive evaluation of the distinguishing statements and factor array revealed neutral viewpoints towards role transition (S15, 0). This could point towards the possibility of indecisiveness or general openness to different opportunities. Finally, participants in Factor 1 did not have strong CPD content preferences. However, an evaluation of the factor array revealed an inclination for CPD relevant to their current practice (S3, +1; S6, +2). This sentiment was potentially ranked lower due to Factor 1 participant's prioritization of CPD format and delivery. These two key concepts and their permutations may be considerations for future CPD programs.

Besides “CPD content” and “career outlook”, concepts such as “program format and delivery” and “cost” were also recurring themes within the respective factor arrays. However, the related Q-sample statements did not heavily influence the interpretation of the generated factors. The exception was Factor 1 participants who were highly concerned about the accessibility and convenience of CPD programs. The Q-sample statements related to “program format and delivery” also encompassed a wide range of program attributes, which may benefit from further dissection and analysis.

Implications for CPD planning

There is perpetual manpower and capacity issues within healthcare due to population trends (ageing population etc) that result in greater healthcare utilization (Bloom et al., 2015). These issues were amplified by the workforce impacts of the COVID-19 pandemic (Boniol et al., 2022). When evaluated through such a lens, the pursuit of value and convenience by participants in Factor 1 could be related to increased workload brought on by the pandemic. In response, CPD programs have pivoted to hybrid or online formats globally (Naciri et al., 2021). The persistence of these sentiments in our post-pandemic inquiry may indicate HCPs’ acceptance and preference for such flexible formats, a paradigm shift from the traditional in-person models. Similar findings were noted from CPD research conducted during the pandemic (Balamurugan et al., 2021; Day et al., 2021 Lorenzoni et al., 2022; Luconi et al., 2022; Micallef & Kayyali, 2022). The prioritization of value and quality

alongside flexible formats illustrates a need for CPD providers to continue ensuring high standards within their distant learning programs. Positive traits like ensuring a concise summary of knowledge and designing programs with appropriate difficulty, volume and length may be areas of focus for CPD providers. Within this study, participants in Factor 1 also shared that it was difficult to find CPD offerings that met all their needs (e.g. High-quality, convenient and flexible). This may indicate that current programs need to be further optimized, with successful models being scaled to enhance availability.

HCPs who align with Factor 2 attributes are primed to attain high degrees of technical expertise, through a focus on CPD activities that develop their core competencies. However, it is important to not neglect the development of interpersonal and patient-centric skillsets. These skills have been linked to important patient outcomes such as improved health, health-seeking behaviours, satisfaction and healthcare utilization (Rathert, Wyrwich & Boren, 2013). CPD program redesigns to support the development of these important skillsets may be warranted. This may be achieved by incorporating features such as interprofessional learning, patient-centred principles and clinical leadership opportunities into technical skills-focused CPD activities. Simulation-based training modalities have been shown to be an effective training strategy (Baker et al., 2008). Such redesigns would allow clinicians to develop holistically amidst monetary resource limitations, a viewpoint that was also highly ranked in the Factor 2 array (S39, +3).

For HCPs who possess viewpoints in-line with Factor 3, CPD is used as form of respite and escape from the stressors of their clinical practice. Similar to HCPs in Factor 1, these viewpoints may be related to workload increases during the COVID-19 pandemic. This constitutes an alternate and less apparent benefit of CPD. However, this concept is not novel, with existing research findings reporting the use and benefits of CPD to "refresh professionally" (Carroll et al., 2021; Gottlieb et al., 2022). As such, employers should ensure that HCPs with Factor 3 attributes are afforded regular CPD opportunities. The use of a professional development portfolio to plan and track CPD activities can be useful to promote learning variety while meeting professional development requirements in the workplace. In terms of preferred topics, Factor 3 participants' interest in non-technical CPD subjects like patient-centred care, EDI and mental health highlights the importance of having a wide range of educational offerings within CPD organizations. CPD providers should continue to consider less conventional CPD needs, ascertaining these needs through regular surveys on educational trends and their learning community's preferences.

Factor 4 represents HCPs who wish to utilize CPD to equip themselves with skillsets beyond those required in their current practice. Professional role re-designs are common phenomenon within healthcare (O'Connor et al., 2012). As such, CPD providers should be familiar with these trends within the individual healthcare disciplines. A multidisciplinary team within CPD

organizations' administration may be a good strategy. Regular consultations with field experts may also be utilized to achieve this.

Understanding the key CPD preferences and needs will allow CPD providers to better cater to HCPs' personal or professional aspirations. The use of a decision-making aid that maps the various learning archetypes to available CPD programs may be good preposition. Based on this study's findings, CPD preferences and needs may be mapped into several domains: "CPD content", "career outlook", "program format and delivery", and "cost". Following discussion, these domains were rephrased into customizable content filters. The domain "CPD content" was changed to "technical skills", a filter used to evaluate if HCPs were more interested in technical or interpersonal topics. Based on Factor 4's distinguishing statements, the domain of "career outlook" may be associated with a desire for "networking and team learning" and exploring "new and innovative developments". As the concept of "program format and delivery" was highly related to whether a CPD program was delivered in-person or online, it was rephrased as "overall formats". Lastly, the frequently highlighted domain of cost was also included. Figure 3 illustrates the five key domains that may serve as content filters in an electronic CPD catalogue. The resulting CDP learning preferences and needs may then be mapped to general categories of CPD activities (Table 9). The consensus statement (S27) highlighted a shared neutral viewpoint towards program difficulty and content volume. As such, "program difficulty" and "content volume" were not included as a domain in Figure 3. CPD providers may wish

to review and consider whether these are appropriate perspectives for the clinician population that they are serving.

Figure 3: Key domains impacting CPD choice

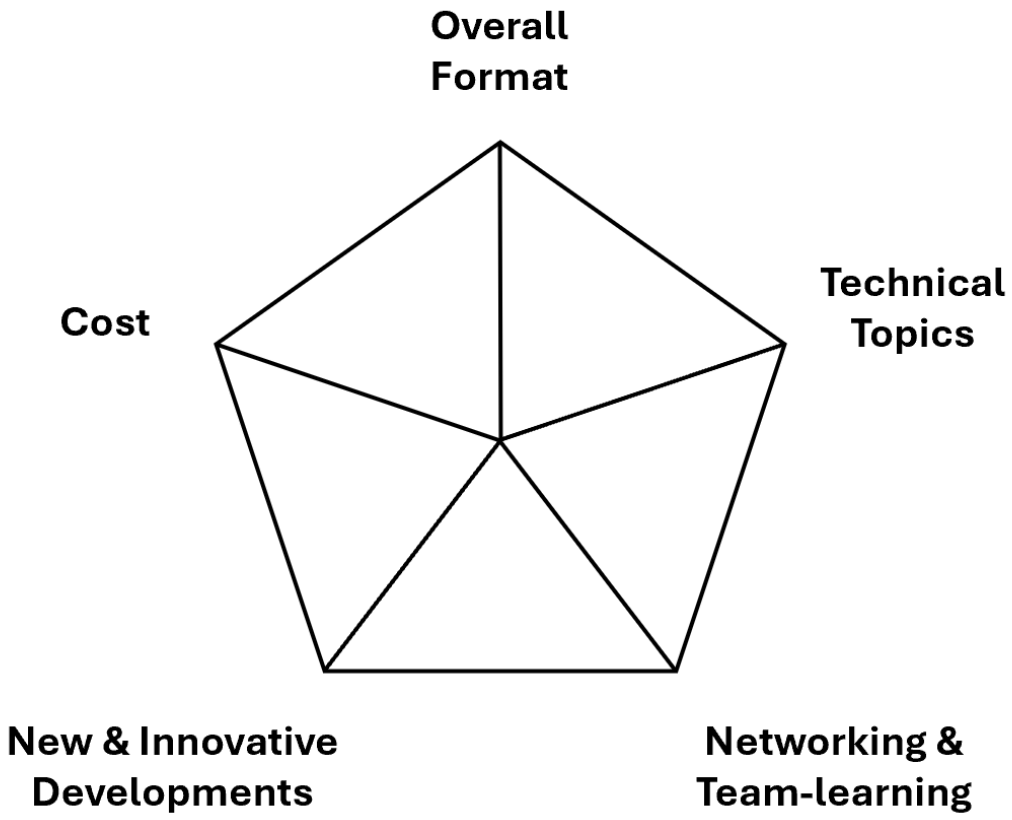


Table 9: Mapping of CPD domains to CPD activities

Domains	Potential CPD activities
Overall format	In-person, hybrid or online formats
Technical topics	Technical topics or interpersonal skills
Networking & team-learning	Conferences, case discussions, problem-based learning, or simulation-based learning
New & Innovative Developments	Clinical updates, grand rounds or emerging roles
Cost	Fully or partially subsidized

Strengths

Continued research on CPD preferences and needs assists CPD providers to navigate the ever-changing learning landscape that is shaped by generational differences amongst learners, sentinel events (COVID-19) and population trends (Pool, Poell & ten Cate, 2013; Taylor & Neimeyer, 2017; Naciri et al., 2021). This study is unique as it leveraged on Q-methodology's ability to explore subjectivity using a limited sample and applied it to a diverse interprofessional population. Q-methodology studies are unable to make statistical inferences due to the lack of adequately powered samples and statistical tests, cornerstones of quantitative methodologies. Instead,

knowledge is derived from exploring different permutations of known attributes. Within this study, this manifested as different archetypes of CPD learning needs, findings that provided more depth than current literature with similar reports. These strengths reinforced the utility of novel research methodologies within seemingly saturated research areas like CPD research. The literature review conducted to assemble CPD preference and needs during the COVID-19 pandemic (2019 to 2023) also consolidated important data related to contemporary CPD choice. The concourse list was further supplemented by program evaluation data and a review by health professions education researchers within the study team. As such, the Q-sample is a useful knowledge product that CPD providers and researchers may use to guide their own inquiry into the topic.

With regards to the participants' demography, the age and occupation of the participants were evenly distributed. This ensured that viewpoints recruited were sufficiently diverse, an important feature as the sampling frame consists of a wide range of HCPs.

Limitations

The four factors that emerged from the by-person factor analysis only accounted for 49.1% of the total variance. Extracting more than four factors was not meaningful due to low factor loadings and reduced factor uniqueness with increasing number of factors. Other demographic variables that were not considered in this study may have also contributed to dissimilar viewpoints (e.g. Amounts of CPD activities attended in the 12-months). A larger scale enquiry with a more extensive evaluation of the participants' demography may be appropriate. Nonetheless, it is important to note that existing research utilizing factor analysis have frequently produced factors that accounted for approximately 50% of the total variance (Peterson, 2000). Beyond statistical evidence, researchers also rely on their expertise to evaluate a factor model's appropriateness and how they are able to "explain the most study variance with the least number of factors" (Watts & Stenner, 2012). As such, this study's findings constitute valid analysis and interpretation.

Factor analysis and factor interpretation also allowed CPD sentiments to be compared within and across this study's factors. As such, this study constitutes a cross-sectional inquiry into HCPs' CPD preferences and needs. Due to a lack of CPD research utilizing Q-methodology, comparisons with a post-pandemic dataset were not possible. Longitudinal Q-methodology studies can unravel even more in-depth viewpoints related to the phenomenon of interest, an endeavour recently undertaken by Akhtar-Danesh and colleagues

(2023). Overall, a greater use of Q-methodology within the CPD research may be warranted.

Chapter 6: Conclusion

This Q-methodology study promoted a greater understanding towards CPD learners' preferences and needs through the generation of several different CPD learner archetypes. HCPs with learning needs that subscribe to the identified factors ("Value and productivity-focused clinicians", "Application and competency-based learners", "Respite seekers", "Growth-oriented professionals") require different resources and support from CPD providers. Factor-specific recommendations that are potentially useful for CPD planning are also available for consideration. They include reviewing current CPD delivery formats and expanding the range of CPD offerings. Further discourse about these contemporary CPD trends may offer even more novel ways to navigate this topic. The identification of interrelated concepts from the conceived factors further supports that attributes impacting CPD choice should not be considered in silo. The interplay of different preferences can result in unique viewpoints towards CPD. CPD organizations should continue to find new ways to match HCPs with their training needs. It may be beneficial to study the utility of decision aids for CPD selection and different models of engagement with CPD participants. Finally, the study team would also like to advocate for the adoption of novel techniques in CPD research (Q-methodology etc.) as it has the propensity to enhance knowledge creation and promote deeper understanding of the subject.

References

Abuloha, S., Sharaydih, R., & Wazaify, M. (2019). Exploring the needs, barriers, and motivation of Jordanian pharmacists towards continuing education. *Tropical Journal of Pharmaceutical Research, 18*(12), 2687-2693. doi:https://dx.doi.org/10.4314/tjpr.v18i12.29

Ahlquist, E. (2022). Canadian perioperative nurses' engagement and perceptions of continuing professional development. *ORNAC Journal, 40*(4), 15-26. Retrieved from http://libaccess.mcmaster.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=160196898&site=ehost-live

Akhtar-Danesh, N. (2018a). Qfactor: A Command for Q-methodology analysis. *The Stata Journal, 18*(2), 432-446. doi:10.1177/1536867X1801800209

Akhtar-Danesh, N. (2018b). Using Cohen's effect size to identify distinguishing statements in Q-methodology. *Open Journal of Applied Sciences, 8*, 73-79. Retrieved from https://doi.org/10.4236/ojapps.2018.82006

Akhtar-Danesh, N., Baumann, A., & Cordingley, L. (2008). Q-Methodology in nursing research: A promising method for the study of subjectivity.

Western Journal of Nursing Research, 30(6), 759-773. doi:10.1177/0193945907312979

Akhtar-Danesh, N., Brewer-Deluce, D., Saini, J., Wojkowski, S., Bayer, I., Saraco, A. N., . . . Wainman, B. (2023). A longitudinal Q-study to assess changes in students' perceptions at the time of pandemic. *Scientific Reports, 13*(1), 8770-8770. doi:10.1038/s41598-023-36003-9

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. doi:10.3390/pharmacy8040207

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. *Journal of Pharmaceutical Policy and Practice, 16*(1), 112. doi:https://dx.doi.org/10.1186/s40545-023-00623-3

Aldosari, H., Alsairafi, Z., & Waheedi, S. (2020). Continuing education in pharmacy: A cross-sectional study exploring pharmacists' attitudes and perceptions. *Saudi Pharmaceutical Journal, 28*(7), 803-813. doi:https://dx.doi.org/10.1016/j.jsps.2020.05.008

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. *Journal of Advanced Pharmaceutical Technology & Research, 12*(4), 368-372. doi:https://dx.doi.org/10.4103/2231-4040.329910

Atreya, S., Datta, S. S., & Salins, N. (2022). Views of general practitioners on end-of-life care learning preferences: A systematic review. *BMC palliative care, 21*(1), 1-25. doi:10.1186/s12904-022-01053-9

Baker, C., Pulling, C., McGraw, R., Dagnone, J. D., Hopkins-Rosseel, D., & Medves, J. (2008). Simulation in interprofessional education for patient-centred collaborative care. *Journal of Advanced Nursing, 64*(4), 372-379. doi:10.1111/j.1365-2648.2008.04798.x

Balamurugan, G., Govindan, R., & Vijayarani, M. (2021). Online learning: Indian nurses' perception and a feasibility study. *Indian Journal of Psychiatric Nursing, 18*(2), 139-143. doi:10.4103/iopn.iopn_86_21

Barton, C. J., Ezzat, A. M., Bell, E. C., Rathleff, M. S., Kemp, J. L., & Crossley, K. M. (2022). Knowledge, confidence and learning needs of physiotherapists treating persistent knee pain in Australia and Canada: A mixed-methods study. *Physiotherapy Theory & Practice, 38*(12), 2073-2085. doi:10.1080/09593985.2021.1906805

Bloom, D. E. P., Chatterji, S. M. D., Kowal, P. P., Lloyd-Sherlock, P. P., McKee, M. P., Rechel, B. P., . . . Smith, J. P. P. (2015). Macroeconomic implications of population ageing and selected policy responses. *Lancet, 385*(9968), 649-657. doi:10.1016/S0140-6736(14)61464-1

Boniol, M., Kunjumen, T., Nair, T. S., Siyam, A., Campbell, J., & Diallo, K. (2022). The global health workforce stock and distribution in 2020 and 2030: A threat to equity and 'universal' health coverage? *BMJ Global Health, 7*(6), e009316. doi:10.1136/bmjgh-2022-009316

Bridgwood, B., Sayers, R., & Charlton, R. (2022). Continuing professional development preferences post Covid-19. *Education for Primary Care, 33*(5), 313-314. doi:10.1080/14739879.2022.2101384

Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven: Yale University Press.

Brown, S. R., Danielson, S., & van Exel, J. (2015). Overly ambitious critics and the Medici Effect: A reply to Kampen and Tamás. *Quality & Quantity, 49*(2), 523-537. doi:10.1007/s11135-014-0007-x

Carroll, M., Brenton-Rule, A., Jepson, H., & Molyneux, P. (2021). Perceptions and satisfaction of a mandatory continuing professional development programme amongst Aotearoa New Zealand podiatrists. *Journal of Foot and Ankle Research, 14*(1), 54. doi:https://dx.doi.org/10.1186/s13047-021-00492-6

Casanova, M. P., Blades, K. C., Palmer, K., Smith, L. H., Fuerst, P., Seegmiller, J. G., & Baker, R. T. (2022). Stakeholder perceptions of the use of a rapidly deployed modified ECHO to train and prepare healthcare providers for COVID-19. *Journal of Public Health Research, 11*(3). doi:https://dx.doi.org/10.1177/22799036221123992

Cervero, R. M., & Gaines, J. K. (2015). The Impact of CME on physician performance and patient health outcomes: An updated synthesis of systematic reviews. *Journal of Continuing Education in the Health Professions, 35*(2), 131-138. doi:10.1002/chp.21290

Churruca, K., Ludlow, K., Wu, W., Gibbons, K., Nguyen, H. M., Ellis, L. A., & Braithwaite, J. (2021). A scoping review of Q-methodology in healthcare research. *BMC Medical Research Methodology, 21*(1), 125-125. doi:10.1186/s12874-021-01309-7

Connolly, M., Browne, F., Regan, G., & Ryder, M. (2020). Stakeholder perceptions of curriculum design, development and delivery for continuing e-learning for nurses. *British Journal of Nursing, 29*(17), 1016-1022. doi:https://dx.doi.org/10.12968/bjon.2020.29.17.1016

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, 30*(4), 220-229. doi:10.1080/14739879.2019.1617644

Curran, V. R., Hollett, A., & Peddle, E. (2023). Virtual care and COVID-19: A survey study of adoption, satisfaction and continuing education preferences of healthcare providers in Newfoundland and Labrador, Canada. *Frontiers in Digital Health, 4*, 970112. doi:https://dx.doi.org/10.3389/fdgth.2022.970112

Dale, C. M., Cioffi, I., Novak, C. B., Gorospe, F., Murphy, L., Chugh, D., . . . Stevens, B. (2023). Continuing professional development needs in pain management for Canadian health care professionals: A cross sectional survey. *Canadian Journal of Pain, 7*(1), 2150156. doi:https://dx.doi.org/10.1080/24740527.2022.2150156

Daloglu, M., & Alimoglu, M. K. (2020). What do otolaryngologists want to learn? An educational targeted needs assessment study. *Brazilian Journal of Otorhinolaryngology, 86*(3), 287-293. doi:https://dx.doi.org/10.1016/j.bjorl.2018.12.001

Davis, D. A., & McMahon, G. T. (2018). Translating evidence into practice: Lessons for CPD. *Medical Teacher, 40*(9), 892-895. doi:10.1080/0142159X.2018.1481285

Day, S. D., Nguyen, K. H., Comans, T., Clemson, L., & Laver, K. (2021). Professional development training preferences of occupational therapists working with older adults in Australia: A discrete choice experiment. *Australian Occupational Therapy Journal, 68*(4), 327-335. doi:10.1111/1440-1630.12731

Dowling, S., Last, J., Finnegan, H., Daly, P., Bourke, J., Hanrahan, C., . . . Cullen, W. (2019a). Impact of participation in continuing medical education small group learning (CME-SGL) on the stress, morale, and professional isolation of rurally-based gps: A qualitative study in ireland. *BJGP Open, 3*(4), 1-10. doi:https://dx.doi.org/10.3399/bjgpopen19X101673

Dowling, S., Last, J., Finnegan, H., O'Connor, K., & Cullen, W. (2019b). Does locally delivered small group continuing medical education (CME) meet the learning needs of rural general practitioners? *Education for Primary Care, 30*(3), 145-151. doi:10.1080/14739879.2019.1573109

Dowling, S., Last, J., Finnegan, H., O'Connor, K., & Cullen, W. (2020). What are the current 'top five' perceived educational needs of Irish general practitioners? *Irish journal of medical science, 189*(1), 381-388. doi:https://dx.doi.org/10.1007/s11845-019-02047-y

Driver, C., Lovell, G. P., & Oprescu, F. (2021). Psychosocial strategies for physiotherapy: A qualitative examination of physiotherapists' reported training preferences. *Nursing & Health Sciences, 23*(1), 136-147. doi:https://dx.doi.org/10.1111/nhs.12771

Dziopa, F., & Ahern, K. (2011). A systematic literature review of the applications of Q-technique and Its methodology. *Methodology, 7*(2), 39-55. doi:10.1027/1614-2241/a000021

Estabrooks, C. A., Midodzi, W. K., Cummings, G. G., Ricker, K. L., & Giovannetti, P. (2005). The impact of hospital nursing characteristics on 30-Day mortality. *Nursing Research, 54*(2), 74-84. doi:10.1097/00006199-200503000-00002

European Commission (2015). Study concerning the review and mapping of continuous professional development and lifelong learning for health professionals in the EU. Retrieved from https://health.ec.europa.eu/document/download/ cc2bd794-03ac-4c12-b012-b7ffe6cb0d20_en?filename=cpd_mapping_ report_en.pdf

Farrimond, H. (2017). A typology of vaping: Identifying differing beliefs, motivations for use, identity and political interest amongst e-cigarette users. *International Journal of Drug Policy, 48*, 81-90. doi:10.1016/j.drugpo.2017.07.011

Fitzgerald, C., Pagnucci, N., Kearns, T., Hallissy, M., Walsh, N., Kelly, C., . . . Aleo, G. (2023). The experience and attitudes of long-term care workers with teaching and learning modalities for the delivery of continuing professional development activities: A mixed-methods study. *Nurse Education in Practice, 72*, 103774. doi:https://dx.doi.org/10.1016/j.nepr.2023.103774

Flannery, M., Carmichael, A., Bermingham, M., & Murphy, K. (2022). Community pharmacists' opinions on their palliative care education needs and preferences of delivery of an educational programme: A qualitative study. *Pharmacy Education, 22*(1), 637-646. doi:https://dx.doi.org/10.46542/pe.2022.221.637646

Flores-Sandoval, C., Sibbald, S., Ryan, B. L., & Orange, J. B. (2021). Interprofessional team-based geriatric education and training: A review of interventions in Canada. *Gerontology & Geriatrics Education, 42*(2), 178-195. doi:10.1080/02701960.2020.1805320

Fox, S. D., & Stone, S. (2022). Identifying the continuing professional development (CPD) needs of Advanced Practitioners (APs) within the UK: A national evaluation. *Journal of the Intensive Care Society, 23*(1 Supplement), 86-88. doi:https://dx.doi.org/10.1177/17511437221095122

French, H. P., & Dowds, J. (2008). An overview of Continuing Professional Development in physiotherapy. *Physiotherapy, 94*(3), 190-197. doi:10.1016/j.physio.2007.09.004

Galvin, E., Wiese, A., Dahly, D., O'Farrell, J., Cotter, J., & Bennett, D. (2020). Maintenance of professional competence in Ireland: A national survey of doctors' attitudes and experiences. *BMJ Open, 10*(12), 042183. doi:https://dx.doi.org/10.1136/bmjopen-2020-042183

Gosselin, M., Perron, A., & Lacasse, A. (2020). Assessment of continuing education needs among critical care nurses in remote Québec, Canada. *Journal of Continuing Education in Nursing, 51*(7), 322-330. doi:10.3928/00220124-20200611-08

Gottlieb, M., Sebok-Syer, S. S., Bawden, A., Shah, M., & Jordan, J. (2022). "Faces on a screen": A qualitative study of the virtual and in-person conference experience. *AEM Education and Training, 6*(6), e10827. doi:https://dx.doi.org/10.1002/aet2.10827

Goulet, F., Hudon, E., Gagnon, R., Gauvin, E., Lemire, F., & Arsenault, I. (2013). Effects of continuing professional development on clinical performance Results of a study involving family practitioners in Quebec. *Canadian Family Physician, 59*(5), 518-525.

Haji Mustapa, M. B., Teo, Y. C., Haji-Abdul-Rahman, H.-K., Abdul-Mumin, K. H., & Rahman, H. A. (2021). Enablers and barriers of continuous professional development (CPD) participation among nurses and midwives. *International Journal of Nursing Education, 13*(3), 75-84. doi:10.37506/ijone.v13i3.16315

Hanlon, H. R., Prihodova, L., Russell, T., Donegan, D., O'Shaughnessy, A., & Hoey, H. (2019). Attitudes, benefits and barriers to participating in mandatory continuing professional development schemes in paediatricians in Ireland. *Archives of Disease in Childhood, 104*(Supplement 3), A260. doi:https://dx.doi.org/10.1136/archdischild-2019-epa.608

Hanlon, H. R., Prihodova, L., Russell, T., Donegan, D., O'Shaughnessy, A., & Hoey, H. (2021). Doctors' engagement with a formal system of continuing professional development in Ireland: A qualitative study in perceived benefits, barriers and potential improvements. *BMJ Open, 11*(11), e049204. doi:https://dx.doi.org/10.1136/bmjopen-2021-049204

Hariyati, R. T. S., & Safril, S. (2018). The relationship between nurses' job satisfaction and continuing professional development. *Enfermería Clínica, 28*, 144-148. doi:10.1016/S1130-8621(18)30055-X

Harnett, N., Tosoni, S., & Wong, R. (2020). Continuing medical education in radiation medicine: International perceptions of learner experiences, outcomes, and program impact. *Radiotherapy and Oncology, 150*(Supplement 1), S67. doi:https://dx.doi.org/10.1016/S0167-8140%2820%2931048-3

Hasan, S., Faragallah, A., Shanableh, S. D., & Alebrahem, S. Q. (2021). Assessing the need for native language in pharmacy education and practice: A survey in the UAE. *International Journal of Pharmacy Practice, 29*(2), 170-177. doi:10.1093/ijpp/riaa006

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. *Evaluation & the Health Professions, 45*(4), 420-424. doi:https://dx.doi.org/10.1177/01632787221126500

Hawkins, S. A., Ehsan, S., & Burkitt, J. J. (2023). Evaluating the training needs of interprofessional teams working in specialized geriatric services. *Perspectives, 44*(3), 6-15. Retrieved from http://libaccess.mcmaster.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=174350531&site=ehost-live

Hensel, D., Cooper, R., & Craney, N. (2018). Operating room personnel viewpoints about certified Registered Nurse Anesthetists. *Western Journal of Nursing Research, 40*(2), 242-256. doi:10.1177/0193945916682730

Hijazeen, R. A., Hammad, A. 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, 21*(3), 2848. doi:https://dx.doi.org/10.18549/PharmPract.2023.3.2848

Ibsen, H., Lillevang, G., Sondergaard, J., & Kjaer, N. K. (2023). "We don't need no education" A qualitative study of barriers to continuous medical education among Danish general practitioners. *BMC Medical Education, 23*(1), 450. doi:https://dx.doi.org/10.1186/s12909-023-04432-9

Institute of Medicine (2010). *Redesigning continuing education in the health professions*. Washington, D.C., United States: National Academies Press.

Jackson, C., Manley, K., Martin, A., & Wright, T. (2015). Continuing professional development for quality care: Context, mechanisms, outcomes and impact. Retrieved from https://repository.canterbury.ac.uk/download/deb3b4bc2d843783c5fcc2e525b867b6df48aba83a02f8f162903f9e4e73af79/1483243/EOF%20-%20FINAL%20REPORT%2030th%20January%202015%20FINAL%20with%20ISBN%20-%20978-1-909067-39-4.pdf

James, A., & Francis, K. (2011). Mandatory continuing professional education: What is the prognosis? *Collegian, 18*(3), 131-136. doi:10.1016/j.colegn.2011.03.001

Jeffries, P. R., Bushardt, R. L., DuBose-Morris, R., Hood, C., Kardong-Edgren, S., Pintz, C., . . . Sikka, N. (2022). The role of technology in health professions education during the COVID-19 pandemic. *Academic Medicine, 97*(3S), S104-S109. doi:10.1097/ACM.0000000000004523

Jordan, K., Harris, H. S., Broderick, C., Reese, K., & Jordan, A. (2022). School nurse perceptions of continuing education: Identifying the process of engagement. *Journal of Continuing Education in Nursing, 53*(1), 35-41. doi:10.3928/00220124-20211210-09

Julian, J. F. E., & Ruiz, F. B. (2020). Continuing professional development (CPD) among educators in selected colleges of nursing: Perceived importance, impact, and challenges. *Enfermería Clínica, 30*, 60-64. doi:10.1016/j.enfcli.2019.09.025

Kafadar, D., Esen, A. D., & Arica, S. (2019). Evaluation of experiences and perceptions of family physicians on continuing medical education and the effect on daily clinical practice. *Konuralp Medical Journal, 11*(3), 337-343. doi:https://dx.doi.org/10.18521/ktd.620552

Kampen, J. K., & Tamás, P. (2014). Overly ambitious: Contributions and current status of Q methodology. *Quality & Quantity, 48*(6), 3109-3126. doi:10.1007/s11135-013-9944-z

Karas, M., Sheen, N. J. L., North, R. V., Ryan, B., & Bullock, A. (2020). Continuing professional development requirements for UK health professionals: A scoping review. *BMJ Open, 10*(3), e032781-e032781. doi:10.1136/bmjopen-2019-032781

Kim, S., Bayer, I., Gewurtz, R., Lariviere, N., & Letts, L. (2022). Comparing web-based and in-person educational workshops for canadian occupational therapists and understanding their learning experiences: Mixed methods study. *JMIR Medical Education, 8*(1), e31634. doi:https://dx.doi.org/10.2196/31634

Lera, M., Taxtsoglou, K., Iliadis, C., Frantzana, A., & Kourkouta, L. (2020). Nurses' attitudes toward lifelong learning via new technologies. *Asian/Pacific Island Nursing Journal, 5*(2), 89-102. doi:https://dx.doi.org/10.31372/20200502.1088

Lorenzoni, A. A., Buendgens, F. B., Manzini, F., Rech, N., & Leite, S. N. (2022). A comprehensive understanding of the use of e-learning in continuing education: Experiences of pharmacists in a public health system. . *Inquiry*, 1-14. doi:10.1177/00469580211059977

Luconi, F., Montoro, R., Lalla, L., & Teferra, M. (2022). An innovative needs assessment approach to develop relevant continuing professional development for psychiatrists. *Academic Psychiatry, 46*(1), 106-113. doi:https://dx.doi.org/10.1007/s40596-021-01564-2

Ma, H., Zhang, S., Zhu, X., Huang, J., Cheng, Z., & Luo, Y. (2023). Continuing professional education experiences and expectations of nurses in Chinese military hospitals: A quantitative and qualitative study. *Nurse Education Today, 120*, 105645. doi:https://dx.doi.org/10.1016/j.nedt.2022.105645

Magwenya, R. H., & Ross, A. (2023). Developing a CPD model for Eswatini: A participatory action research study. *BMC Medical Education, 23*(1), 45. doi:https://dx.doi.org/10.1186/s12909-023-04016-7

Magwenya, R. H., & Ross, A. J. (2021). Continuing professional development in Eswatini: Factors affecting medical practitioners' participation. *South African Family Practice, 63*(1), a5395. doi:https://dx.doi.org/10.4102/safp.v63i1.5395

Magwenya, R. H., Ross, A. J., & Ngatiane, L. S. (2023). Continuing professional development in the last decade: A scoping review. *Journal of Adult and Continuing Education, 29*(2), 408-437. doi:10.1177/14779714221147297

Main, P. A. E., & Anderson, S. (2023). Evidence for continuing professional development standards for regulated health practitioners in Australia: A systematic review. *Human Resources for Health, 21*(1), 23-23. doi:10.1186/s12960-023-00803-x

Manley, K., Martin, A., Jackson, C., & Wright, T. (2018). A realist synthesis of effective continuing professional development (CPD): A case study of healthcare practitioners' CPD. *Nurse Education Today, 69*, 134-141. doi:10.1016/j.nedt.2018.07.010

Marinopoulos, S. S. (2007). *Effectiveness of continuing medical education*. Rockville, Md: Agency for Healthcare Research and Quality.

Masic, I., Miokovic, M., & Muhamedagic, B. (2008). Evidence based medicine: New approaches and challenges. *Acta Inform Med, 16*(4), 219-225. doi:10.5455/aim.2008.16.219-225

McKeown, B., & Thomas, D. B. (2013). *Q methodology* (Second edition. ed.). Los Angeles: SAGE.

Messmer, P. R. (2008). Enhancing nurse-physician collaboration using pediatric simulation. *The Journal of Continuing Education in Nursing, 39*(7), 319. doi:10.3928/00220124-20080701-07

Micallef, R., Huet, I., & Kayyali, R. (2020). Current reality and preferences for continuing professional development of pharmacists in England: Supporting pharmacists to achieve their CPD requirements. *Pharmacy Education, 20*, 103-115. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed21&NEWS=N&AN=2004907772

Micallef, R., & Kayyali, R. (2022). Interviews with global pharmacists and healthcare professionals in great britain to establish personal experiences around professional development activity. *Pharmacy, 10*(1), 7. doi:https://dx.doi.org/10.3390/pharmacy10010007

Milgrom, Z. Z., Severance, T. S., Scanlon, C. M., Carson, A. T., Janota, A. D., Burns, J. L., . . . Mendonca, E. A. (2022). Enhancing cancer prevention and survivorship care with a videoconferencing model for continuing education: A mixed-methods study to identify barriers and incentives to participation. *JAMIA Open, 5*(1), ooac004. doi:https://dx.doi.org/10.1093/jamiaopen/ooac004

Mohamed Afif, A., Goh, M. Z. H., Lin, Y. J., Ho, G. D., Anwar, T., Chong, C. M., & Sim, J. (2021). An analysis of the continuing professional development needs of radiographers and radiation therapists in Singapore. *Radiography, 27*(3), 927-934. doi:10.1016/j.radi.2021.03.002

Moorley, C., & Chinn, T. (2019). Social media participatory CPD for nursing revalidation, professional development and beyond. *British Journal of Nursing, 28*(13), 870-877. doi:https://dx.doi.org/10.12968/bjon.2019.28.13.870

Mutati, R. K., Mwila, C., Mudenda, S., Munkombwe, D., Mufwambi, W., Muungo, L. T., . . . Kalungia, A. C. (2022). Continuing professional development needs of pharmacy professionals in Zambia: Findings and future directions. *Pharmacy Education, 22*(1), 301-311. doi:https://dx.doi.org/10.46542/pe.2022.221.301311

Naciri, A., Radid, M., Kharbach, A., & Chemsi, G. (2021). E-learning in health professions education during the COVID-19 pandemic: A systematic review. *Journal of educational evaluation for health professions, 18*, 27-27. doi:10.3352/jeehp.2021.18.27

Nicoll, P., MacRury, S., van Woerden, H. C., & Smyth, K. (2018). Evaluation of technology-enhanced learning programs for health care professionals: Systematic review. *Journal of Medical Internet Research, 20*(4), e131-e131. doi:10.2196/jmir.9085

O'Connor, P., Ritchie, J., Drouin, S., & Covell, C. L. (2012). Redesigning the workplace for 21st century healthcare. *Healthcare Quarterly, 15*(SP1), 30-35. doi:10.12927/hcq.2012.22844

Obreli-Neto, P. R., Marques dos Reis, T., Guidoni, C. M., Girotto, E., Guerra, M. L., de Oliveira Baldoni, A., & Leira Pereira, L. R. (2016). A systematic review of the effects of continuing education programs on providing clinical community pharmacy services. *American Journal of Pharmaceutical Education, 80*(5), 88-88. doi:10.5688/ajpe80588

Oliveira, A., Mezil, Y., Akhtar-Danesh, N., Palombella, A., Rockarts, J., Wojkowski, S., & Wainman, B. (2024). Student perceptions of hybrid delivery of interprofessional anatomy: The best of both worlds? *Anatomical Sciences Education, 17*(1), 128-138. doi:10.1002/ase.2330

Olson, V. D. (2011). Generational diversity: Implications for healthcare leaders. *Journal of Business & Economics Research, 6*(11). doi:10.19030/jber.v6i11.2486

Overbay, D., Bigand, T., & Springer, G. (2021). Perceptions of live streaming compared with an in-person nursing conference: A quality improvement project. *The Journal of Nursing Administration, 51*(12), 645-650. doi:10.1097/NNA.0000000000001088

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., . . . Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71-n71. doi:10.1136/bmj.n71

Palma, J. A. F. S., Oducado, R. M. F., & Palma, B. S. (2020). Continuing professional development: Awareness, attitude, facilitators, and barriers among nurses in the Philippines. *Nursing Practice Today, 7*(3), 198-207. Retrieved from http://libaccess.mcmaster.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=143669353&site=ehost-live

Patel, H., Tan, C. J., Toh, Y. L., Danilak, M., & Alexander, M. (2021). Educational needs of oncology pharmacists: A survey by the International Society of Oncology Pharmacy Practitioners. *Journal of Oncology Pharmacy Practice, 27*(3), 623-634. doi:10.1177/1078155220929754

Paterson, C. B., & Edmond, N. (2019). What do the stories of experienced sports physiotherapists' tell us about their continuing professional learning. *International Journal of Sports Physical Therapy, 14*(6), S9-S9. Retrieved from http://libaccess.mcmaster.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=140307738&site=ehost-live

Peters, M. D. J., Marnie, C., Tricco, A. C., Pollock, D., Munn, Z., Alexander, L., . . . Khalil, H. (2020). Updated methodological guidance for the conduct of scoping reviews. *JBI Evidence Synthesis, 18*(10), 2119-2126. doi:10.11124/jbies-20-00167

Peterson, R. A. (2000). A meta-analysis of variance accounted for and factor loadings in exploratory factor analysis. *Marketing Letters, 11*(3), 261-275. doi:10.1023/A:1008191211004

Phillips, J. L., Piza, M., & Ingham, J. (2012). Continuing professional development programmes for rural nurses involved in palliative care delivery: An integrative review. *Nurse Education Today, 32*(4), 385-392. doi:10.1016/j.nedt.2011.05.005

Pogge, E. K., & Davis, L. E. (2021). Fostering mindfulness in continuing pharmacy education using a board game: Initial experiences and perceptions. *The Journal of Continuing Education in the Health Professions, 41*(3), 230-233. doi:https://dx.doi.org/10.1097/CEH.0000000000000351

Pool, I., Poell, R., & Cate, O. t. (2013). Nurses' and managers' perceptions of continuing professional development for older and younger nurses: A focus group study. *International Journal of Nursing Studies, 50*(1), 34-43. doi:10.1016/j.ijnurstu.2012.08.009

Pracilio, A., Cashin, A., & Wilson, N. J. (2023). Barriers and enablers to nurses' engagement with continuing professional development: A survey. *Journal of Continuing Education in Nursing, 54*(9), 405-412. doi:https://dx.doi.org/10.3928/00220124-20230816-16

Puengrung, S., Watcharadamrongkun, S., & Winit-Watjana, W. (2020). Training needs of thai community pharmacists for primary care pharmacy: Qualitative exploration. *Thai Journal of Pharmaceutical Sciences, 44*(3), 197-204. Retrieved from http://www.tjps.pharm.chula.ac.th/ojs/index.php/tjps/article/view/229/258

Ramlo, S. E., & Newman, I. (2011). Q Methodology and its position in the mixed-methods continuum. *Operant Subjectivity, 34*(3). doi:10.22488/okstate.11.100594

Rathert, C., Wyrwich, M. D., & Boren, S. A. (2013). Patient-centered care and outcomes: A systematic review of the literature. *Medical Care Research and Review, 70*(4), 351-379. doi:10.1177/1077558712465774

Reis, T., Faria, I., Serra, H., & Xavier, M. (2022). Barriers and facilitators to implementing a continuing medical education intervention in a primary health care setting. *BMC Health Services Research, 22*(1), 638. doi:https://dx.doi.org/10.1186/s12913-022-08019-w

Ross, K., Barr, J., & Stevens, J. (2013). Mandatory continuing professional development requirements: What does this mean for Australian nurses. *BMC Nursing, 12*(1), 9-9. doi:10.1186/1472-6955-12-9

Rouleau, G., Gagnon, M.-P., Côté, J., Payne-Gagnon, J., Hudson, E., Dubois, C.-A., & Bouix-Picasso, J. (2019). Effects of e-learning in a continuing education context on nursing care: Systematic review of systematic qualitative, quantitative, and mixed-studies reviews. *Journal of Medical Internet Research, 21*(10), e15118-e15118. doi:10.2196/15118

Taylor, J. M., & Neimeyer, G. J. (2017). The ongoing evolution of continuing education. In Rousmaniere, T., Goodyear, R. K., Miller, S. D., & Wampold, B. E. (2017). *The cycle of excellence: Using deliberate practice to improve supervision and training*. Hoboken, NJ: John Wiley & Sons, Ltd.

Ruddy, M. P., Thomas-Hemak, L., & Meade, L. (2016). Practice transformation: Professional development is personal. *Academic Medicine, 91*(5), 624-627. doi:10.1097/ACM.0000000000001059

Ryan, M., Lindquist, K., Wandler, A., Morgan, C., Biswas, S., Flowers, E., . . . Hyland, K. (2021). Are clinicians ready for genomic medicine? Assessing educational needs. *Molecular Genetics and Metabolism, 132*(Supplement 1), S299. doi:https://dx.doi.org/10.1016/S1096-7192%2821%2900546-1

Schindel, T. J., Yuksel, N., Breault, R., Daniels, J., Varnhagen, S., & Hughes, C. A. (2019). Pharmacists' learning needs in the era of expanding scopes of practice: Evolving practices and changing needs. *Research in Social & Administrative Pharmacy, 15*(4), 448-458. doi:10.1016/j.sapharm.2018.06.013

Seki, M., Fujinuma, Y., Matsushima, M., Joki, T., Okonogi, H., Miura, Y., . . . Hiramoto, J. (2022). Use of a 2-year continuing professional development programme to change Japanese physicians' attitudes to learning primary care: A qualitative study. *BMJ Open, 12*(7), e059925. doi:https://dx.doi.org/10.1136/bmjopen-2021-059925

Sibbald, S., Jegatheeswaran, J., Pocock, H., & Penney, G. (2020). A national survey of educational and training preferences and practices for public health nurses in Canada. *Journal of Continuing Education in Nursing, 51*(1), 25-31. doi:10.3928/00220124-20191217-06

Simkhada, B., van Teijlingen, E., Pandey, A., Sharma, C. K., Simkhada, P., & Singh, D. R. (2023). Stakeholders' perceptions of continuing professional development among Nepalese nurses: A focus group study. *Nursing Open, 10*(5), 3336-3346. doi:https://dx.doi.org/10.1002/nop2.1586

Singh, R., Farr, M. A., Chan, W. H., Akkurt, Z. M., Huang, W. W., Strowd, L. C., & Feldman, S. R. (2022). Beyond traditional meetings and webinars: Identifying the educational preferences of practicing dermatologists. *Dermatology Online Journal, 28*(2), 13. doi:https://dx.doi.org/10.5070/D328257405

Slaughter, Y., Aliani, R., Bonar, G., & Keary, A. (2024). Early childhood educators' viewpoints on linguistic and cultural diversity: A Q methodology analysis. *Linguistics and education, 79*, 101265. doi:10.1016/j.linged.2023.101265

Smith, J., Kean, S., Vauhkonen, A., Elonen, I., Silva, S. C., Pajari, J., . . . Salminen, L. (2023). An integrative review of the continuing professional development needs for nurse educators. *Nurse Education Today, 121*, N.PAG-N.PAG. doi:10.1016/j.nedt.2022.105695

Stanley, E. R., Hafford, A., Naseman, R., Li, J., Worley, M., & Mehta, B. H. (2021). Assessment of pharmacy technician learning preferences and implications for training. *American Journal of Health-System Pharmacy, 78*, S16-S25. doi:10.1093/ajhp/zxaa362

Stephenson, W. (1986). Protoconcursus: The concourse theory of communication. *Operant Subjectivity, 9*(2). doi:10.22488/okstate.86.100574

Stevens, C. J., Horrigan, J., Heale, R., & Koren, I. (2020). Northeastern Ontario nurses' perceptions of e-learning: An interpretive description. *Nurse Education Today, 92*, 104509. doi:https://dx.doi.org/10.1016/j.nedt.2020.104509

Stewart, H., Wisby, D., & Roddam, H. (2020). Physiotherapists' reported attitudes to and perceived influences on their continuing professional development: Results of an online questionnaire. *International Journal of Therapy & Rehabilitation, 27*(4), 1-13. doi:10.12968/ijtr.2018.0114

Tame, S. L. (2013). The effect of continuing professional education on perioperative nurses' relationships with medical staff: findings from a qualitative study. *Journal of advanced nursing, 69*(4), 817-827. doi:10.1111/j.1365-2648.2012.06065.x

Tarchichi, T. R., & Szymusiak, J. (2020). Attending physician's attitudes toward podcasting as a source of medical education: An exploratory study. *Journal of Continuing Education in the Health Professions, 40*(2), 141-144. doi:10.1097/CEH.0000000000000291

Tran, D., Tofade, T., Thakkar, N., & Rouse, M. (2014). US and international health professions' requirements for continuing professional development. *American Journal of Pharmaceutical Education, 78*(6), 129-129. doi:10.5688/ajpe786129

Tsantili, I., Hadjidema, S., & Galanis, P. (2021). Identification of the training needs of health care professionals in Greece. *International Journal of Caring Sciences, 14*(1), 115-126. Retrieved from http://libaccess.mcmaster.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=150568752&site=ehost-live

Undilashvili, A., Beriashvili, R., & Khutsishvili, L. (2020). Needs assessment for effective continuous professional development of physicians in Georgia. *Georgian medical news*(298), 152-158. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emexb&NEWS=N&AN=631207968

Vova-Chatzi, M., Saridi, M., Contiades, X., Jimoyiannis, A., & Souliotis, K. (2019). Investigation, recording and assessment of professional education needs of the health sector personnel in Greece via delphi technique. *International Journal of Caring Sciences, 12*(2), 737-747. Retrieved from http://libaccess.mcmaster.ca/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=cin20&AN=138636061&site=ehost-live

Wagner, F., Knipfer, C., Holzinger, D., Ploder, O., & Nkenke, E. (2019). Webinars for continuing education in oral and maxillofacial surgery: The Austrian experience. *Journal of Cranio-Maxillo-Facial Surgery, 47*(4), 537-541. doi:https://dx.doi.org/10.1016/j.jcms.2019.01.009

Watts, S., & Stenner, P. (2012). *Doing Q methodological research theory, method and interpretation*. Los Angeles, California : SAGE.

Webler, T., Danielson, S., & Tuler, S. (2009). Using Q method to reveal social perspectives in environmental research. Retrieved from http://www.seri-us.org/sites/default/files/Qprimer.pdf

Wolf, A. (2009). Subjectivity, the researcher, and the researched. *Operant Subjectivity, 32*(1). doi:10.22488/okstate.09.100571

Xing, W., Ao, L., Xiao, H., & Liang, L. (2020). Chinese nurses' preferences for and attitudes about e-learning in continuing education: A correlational study. *Journal of Continuing Education in Nursing, 51*(2), 87-96. doi:https://dx.doi.org/10.3928/00220124-20200115-08

Younes, N. A., Abualrub, R., Alshraideh, H., Abu-Helalah, M. A., Alhamss, S., & Qanno, O. (2019). Engagement of jordanian physicians in continuous professional development: Current practices, motivation, and barriers. *International Journal of General Medicine, 12*, 475-483. doi:https://dx.doi.org/10.2147/IJGM.S232248

Yu, X., Huang, Y., & Liu, Y. (2022). Nurses' perceptions of continuing professional development: A qualitative study. *BMC Nursing, 21*(1), 1-8. doi:10.1186/s12912-022-00940-z

Zou, Y., Almond, A., & Forbes, R. (2023). Professional development needs and decision-making of new graduate physiotherapists within Australian private practice settings. *Physiotherapy Theory & Practice, 39*, 317-327. doi:10.1080/09593985.2021.2007559

Appendices

Appendix A – Search Strategy (Accessed 17 Jan 2023)

Database	Context	Facilitators/Barriers	Methods
Medline via Ovid (449 records)	(Continuing Education or Continuing Professional or Continuing Medical Education or Continuing Nursing Education or Continuing Nursing Development or Continuing Pharmacy Education).ab,ti. exp Education, Continuing/	(Facilitator* or Attitude* or Belief* or Experience* or Perception* or Barrier* or Challenge* or Deter*).ti.	exp Qualitative Research/
CINAHL via EBSCOhost (446 records)	TI/AB (“Continuing Education” OR “Continuing Professional” OR “Continuing Medical Education” OR “Continuing Nursing Education” OR “Continuing Nursing Development” OR “Continuing Pharmacy Education”)	TI (Facilitator* OR Attitude* OR Belief* OR Experience* OR Perception*) TI (Barrier* OR Challenge* OR Deter*)	(MH "Qualitative Studies+")

	MH "Education, Continuing+" **MeSH Includes:** Education, Dental, Continuing Education, Medical, Continuing Education, Nursing, Continuing Education, Pharmacy, Continuing Education, Professional, Retraining		
Embase via Ovid (570 records)	(Continuing Education or Continuing Professional or Continuing Medical Education or Continuing Nursing Education or Continuing Nursing Development or Continuing Pharmacy Education).ab,ti. exp Education, Continuing/	(Facilitator* or Attitude* or Belief* or Experience* or Perception* or Barrier* or Challenge* or Deter*).ti.	exp Qualitative Research/

Psycinfo via Ovid (153 records)	(Continuing Education or Continuing Professional or Continuing Medical Education or Continuing Nursing Education or Continuing Nursing Development or Continuing Pharmacy Education).ab,ti. exp Education, Continuing/	(Facilitator* or Attitude* or Belief* or Experience* or Perception* or Barrier* or Challenge* or Deter*).ti.	exp Qualitative Methods/

Appendix B – Screening Questions

Title/abstract screen

Q1. Is this article in English?

(If No > Omit)

(If Yes, proceed to Q2)

Q2. Is this article related to healthcare professionals regardless of professions?

(If No > Omit)

(If Yes or unsure, proceed to Q3)

Q3. Is this article about CPD/health professions training?

(If No > Omit)

(If Yes or unsure, proceed to Q4)

Q4. Does the article talk about needs/perceptions/attitudes/experiences?

(If No > Omit)

(If Yes or unsure, proceed to Q5)

Q5. Does the article talk about facilitators/motivations OR barriers/challenges?

(If No > Omit)

(If Yes or unsure, include for full-text screening)

Full Text Screen

Q1. Does the article also include the viewpoints of non-healthcare professionals as well?

(If Yes > Omit)

(If No or unsure, Proceed to Q2)

Q2. Does the article explore ONLY specific, discipline-specific CPD needs? (eg. For nurses, wound dressing, medication safety)

(If Yes > Omit)

(If No, Include)

Appendix C – Letter of Information

LETTER OF INFORMATION

Healthcare professional's preferences and needs for Continuing Professional Development activities: A Q-methodology study

Investigators:

Local Principal Investigator:

Dr. Noori Akhtar-Danesh

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School of Nursing

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Student Investigator:

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Co-Investigator:

Dr. Elif Bilgic

Assistant Professor

Department of Pediatrics

McMaster University

Hamilton, ON, Canada

Purpose of the Study

This research study aims to explore the preferences and needs of healthcare professionals, with regards to continuing professional development (CPD). You are invited to take part in this study as we hope to learn more about your experience with CPD. Your participation would allow us to gain deeper insights into the current attitudes and opinions of practising healthcare professionals.

Procedures involved in the Research

You will be required to complete two, one-time activities if you agree to participate in this study. Both activities may be done on either a computer or smartphone. Firstly, you will need fill-up a baseline demographic survey that will inquire about your age, healthcare profession, location of practice, and years of experience in the profession. Questions related to study eligibility will also be asked here. A unique participant code will also be generated based on your responses. This will be done through an online survey platform (Microsoft Forms) and will take approximately 3 to 5 minutes. You will not be required to provide your name or any other identifiable information.

Secondly, you will need to rank and sort a number of statements related to CPD via an online platform (htmlQ) as part of this study. This exercise may take 15 to 20 minutes. A link to the online platform and information on its use

will be furnished via email. The study investigator may be contacted if you encounter any problem.

Potential Harms, Risks or Discomforts:

It is not likely that there will be any harms or discomforts from/associated with participation in this study. If the statements from the sorting exercise make you feel uncomfortable, you can stop taking part at any time.

Potential Benefits

During the recent COVID-19 pandemic, healthcare educators needed to innovate and adopt alternate models to ensure training continuity. These new CPD formats and teaching models were also inadvertently imposed on CPD participants. Such experiences have the propensity to shape healthcare providers' viewpoints towards CPD. As such, the information you shared will contribute to the overall understanding towards CPD and help guide organizations and researchers as they revise their offerings/pilot new training models. This ensures that contemporary CPD needs are met.

Confidentiality

You are participating in this research anonymously. No one including me will know that you have participated. The data you provide will be stored securely.

Information kept on a computer will be protected by a password. Once the study is completed, an archive of the data, without identifying information, will be stored on the McMaster University institutional server for up to 6 months. Following that, study data will be retained in a local computer belonging to the Principal Investigator for a maximum period of 5 years. The Unique Participant Code generated in the demographic survey will be used solely to combine the datasets. This code will be destroyed approximately 2 months after data collection is completed. For the purposes of ensuring proper monitoring of the research study, it is possible that representatives of the Hamilton Integrated REB (HiREB), this institution, and affiliated sites or regulatory authorities may consult your original (identifiable) research data to check that the information collected for the study is correct and follows proper laws and guidelines. By participating in this study, you authorize such access.
By participating in this study, you do not waive any rights to which you may be entitled under the law.

Participation and Withdrawal

Your participation in this study is voluntary. You can decide to withdraw at any time, part-way through the study or even after completion of the survey and/or Q-sort exercise. If you decide to withdraw, there will be no consequences to you. However, as this study consists of anonymous data, the researchers do not know who is taking part. It will not be possible to withdraw your responses once you have completed the survey, because the researchers will not know

which answers are yours. Participation in other studies is allowed while you are involved in this study. You do not need to report your involvement to us.

Information about the Study Results

I expect to have this study completed by approximately September 2024. If you would like a brief summary of the results, please let us know how you would like it sent to you.

Questions about the Study

If you have questions or need more information about the study itself, please contact Mr. Nicholas Neo via the following email neon@mcmaster.ca. The Local Principal Investigator, Dr. Noori Akhtar-Danesh may also be contacted via the following telephone number (905) 525-9140 ext. 22297 or email daneshn@mcmaster.ca

This study has been reviewed by the Hamilton Integrated Research Ethics Board (HiREB). The HiREB is responsible for ensuring that participants are informed of the risks associated with the research, and that participants are free to decide if participation is right for them. If you have any questions about your rights as a research participant, please call the Office of the Chair, HiREB, at 905.521.2100 x 42013.

Appendix D – Recruitment Flyer

McMaster University
HEALTH SCIENCES
Continuing Professional Development

PARTICIPANTS NEEDED FOR RESEARCH

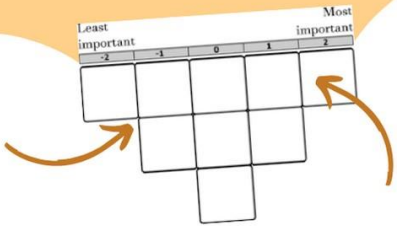
A Q-methodology study investigating healthcare professional's current **preferences and needs for Continuing Professional Development (CPD) activities.**

ELIGIBILITY

- A healthcare professional, regardless of profession
- Have at least **ONE** year of work experience in the specified profession
- Participated in CPD activities in the past **ONE** year?

WHAT TO EXPECT?

- A short demographic survey (5-10mins)
- Review statements and sort it based on how important it is to you (15-20mins)



A ONE-TIME ONLINE DATA COLLECTION IS DONE THROUGH THE FOLLOWING QR CODE

For more information about this study, please contact: Mr. Nicholas Neo at neon@mcmaster.ca

This study has been reviewed by the Hamilton Integrated Research Ethics Board under Project # 17320
Version #2, Version Date 28th Feb 2024

Appendix E – Microsoft Forms Script

(First Page – Letter of Introduction Page 1)

Thank you for your gracious participation in the research study titled: "Healthcare professionals' preferences and needs for Continuing Professional Development activities: A Q-methodology study"

Please ensure that you have read and understood the research processes outlined in the Letter of Information (available below and within email sent).

Please also note that completing this survey and subsequent sorting exercise on a **computer or large-screen tablet** is highly recommended.

(Letter of Introduction Page 1 will be attached here)

(Second Page – Letter of Introduction Page 2)

(Letter of Introduction Page 2 will be attached here)

(Third Page – Instructions)

You will be required to complete a demographic survey and sorting exercise. By completing these research activities, you are confirming that you have read and understood the information in the Letter of Information provided through the recruitment email you have received, have had any questions answered, and agree to take part in this study.

For further enquiries, please contact Mr. Nicholas Neo at neon@mcmaster.ca

(Fourth page – Eligibility Criteria)

You will not be eligible for this study if you answer "No" to any of the following questions. We would like to thank you for your time and kind consideration to participate in this study.

Eligibility Criteria	**Question**	**Options**
Occupation	Q1. Are you a healthcare professional?	Yes/No
Years of experience	Q2. Do you have at least one year of work experience as a healthcare professional?	Yes/No
CPD involvement	Q3. Have you participated in CPD activities within the last one year?	Yes/No

(Fifth page – Demographic Information)

You are eligible to participate in this study based on the eligibility assessment.

This is a demographic survey that will provide us with additional information needed to conduct in-depth data analysis for research. Only anonymous data will be collected for this study.

Please answer the following demographic survey questions.

Demographic Information	Question	Options
Age	Please indicate your age:	- Below 30 years old - 30 to 39 years old - 40 to 49 years old - 50 to 59 years old - 60 to 69 years old - 70 years old and above
Occupation	Please indicate your primary occupation:	- Family Practitioner - Resident - MD-Specialist - Physician Assistant - Nurse - Nurse Practitioner - Pharmacist - Physiotherapist - Occupational Therapist - Researcher - Others
Years of experience	Please indicate your years of experience within the indicated primary occupation:	Numerical
Location of practice	Please indicate the location of your practice (City/Province/Country), where applicable	Open-ended

(Sixth page – Unique Participant Code)

This study requires the researchers to link your demographic data with the Q-sort exercise data. A Unique Participant Code (UPC) will be generated to achieve this. Kindly note the following descriptors that will aid you with UPC generation.

- Please choose two alphabets from A to Z at random
- Please choose three numbers from 1 to 9 at random
- Profession code as follows: (M) Medicine, (N) Nursing, (P) Pharmacy, (A) Allied Health, (O) Others

Please generate your UPC based on the following formula: <Choose two alphabets from A-Z><Choose three numbers from 1-9><Profession code>

If you are a **nurse** who have chosen the alphabets **RG** and numbers **041,** your UPC will be **RG041N**

Unique Participant Code	Please indicate your Unique Participant Code based on the guidance above Ensure that you have written down the UPC somewhere for administrative purposes. Do also ensure that you enter the same code for the Q-sort exercise. Thank you.	Open-ended

(Seventh page – Q-Sort Exercise)

The link to the Q-sort exercise is provided below. You will be required to rank and sort a number of statements related to your preferences and needs towards Continuing Professional Development. More instructions will be available in the next platform.

(URL here)

Once again, we would like to thank you for your participation in this study. For further enquiries or technical issues, please contact Mr. Nicholas Neo at neon@mcmaster.ca

Appendix F: Overall Factor Loading

No.	Statement	F1	F2	F3	F4
1	I use CPD to refresh my knowledge on topics that I have lost touch with	0	+2	+2	-2
2	I use CPD to stay updated in my field of practice	-2	+5	+2	-1
3	I will participate in CPD activities that focus on application to clinical practice	+1	+4	+1	-5
4	I use CPD as a mental health or spiritual resource (to manage my stress, burnout levels etc)	-5	-2	+4	-2
5	I am interested in non-clinical CPD topics (how to navigate regulatory processes, leadership etc)	-1	-4	+2	+5
6	I will attend CPD activities that are relevant to my practice and meet the needs of my clinical role	+2	+4	+2	-5
7	It is important that CPD programs are convenient and do not disrupt my personal and professional schedule	+3	+1	-3	+1
8	I view CPD as a platform for networking, socializing and collaborative learning within my profession	-4	-4	+3	+2

9	I enjoy the interprofessional learning and collaboration opportunities that are possible through CPD	-2	+2	0	+2
10	I participate in CPD as my employers recognize my efforts and count it towards my overall performance and career progression	-5	-1	-3	-1
11	I participate in CPD to meet the requirements for license renewal	-1	+3	0	-3
12	I participate in CPD to refresh professionally and stay motivated	-3	+2	+4	+3
13	I take part in CPD to become more skilled and competent in what I do	+1	+5	+1	+5
14	I participate in CPD activities to attain professional certifications (Short courses, Postgraduate diploma, Master's degree)	-3	+1	-4	+3
15	I am interested in CPD activities that help me with role transition	-2	0	-2	+4
16	I value the autonomy to select my own CPD activities	+4	0	0	-1
17	The overall CPD delivery format is important to me (online, in-person, blended)	+5	-2	-1	+4
18	I prefer CPD formats that allow me to access content in my own time and pace	+5	-4	-3	0

19	I find that informal CPD activities that occur during work are important sources of learning (Teaching and precepting, clinical shadowing, case discussions etc)	-1	+4	+1	0
20	It is important that CPD programs are engaging and interactive	+2	-1	+3	+4
21	The profile of speakers/trainers influences my CPD choice	-4	0	0	+1
22	I will attend CPD if the organizing body has a good reputation	0	+1	-1	-1
23	I am drawn to high quality CPD programs that are well-organized, designed and delivered	+4	+1	+1	+2
24	I believe that social media should be used to enhance learning in CPD	-4	-2	-2	0
25	I believe that CPD activities should be culturally competent (cultural sensitivity, cater to patient's language needs)	+2	-5	+5	-4
26	I think CPD activities should provide a concise summary of knowledge	+3	+3	-2	+2
27	I think that CPD activities should have appropriate difficulty and volume of content	+1	0	+1	0
28	I would like to personalize my CPD learning experience within a program	+1	-3	-1	+1

29	I prefer CPD programs that provide appropriate learning support mediums (Pre/post-activity PowerPoint slides, Summary of discussions)	+1	+1	-2	+1
30	Burdensome administrative processes affect my CPD participation (Registration, setup, recording participation hours)	0	0	-4	-1
31	I feel that CPD activities on familiar topics do not result in meaningful learning	0	-3	-4	-4
32	The location of CPD training affects my choice	+4	-1	0	0
33	The length of CPD programs affects my choice	+3	-2	-1	-2
34	I have difficulties knowing the availability of and planning for CPD activities	-1	-3	-5	-2
35	I prefer to learn in a safe and non-judgemental learning environment	+2	0	+3	0
36	I will choose CPD offerings that highlight equity, diversity and inclusion dimensions	0	-5	+5	-3
37	I prefer CPD activities that provide a program outline and clear objectives which are met by the end of the session	0	+2	0	+1
38	My CPD experience is affected when I perceive biases and conflict of interests in the activity content	-1	-1	+4	-4

39	I am concerned about the costs related to CPD participation	-2	+3	-1	+3
40	I am concerned about technical issues (general/equipment/ infrastructure-related) that affect my CPD access and experience	-3	-1	-5	-3

Appendix G – Qualitative Data

Factor	Supplementary Statement (Unique Participant Code)
Factor 1: Value and productivity-focused clinicians	**Value-focused** “Has to be high yield and translate directly into improvements for my role otherwise (it) is not worth the time/money to take time away from personal and professional responsibilities to attend” (AB15M) “I don't want to waste my time with CPD that is not meaningful or well organised.” (DJ28M) “I have very little time allocated for CPD and I want to attend high quality” (EB20M) “Cost of travel and accommodation” (BK31M) “I have very little vacation time and money and I want to ensure the CPD I attend is high quality and value for the money.” (EB20M)

	Productivity-focused “Flexibility is key for a busy clinician who does not have time during the working day for professional education” (DB22A) “Taking time away from work has financial implications and challenges finding coverage/catching up upon return.” (AB15M) “I am over worked and need flexibility” (ER27M) **Different definitions of “high quality training”** “I find many CPD activities can be a waste of time and too basic at this point in my practice and find it more helpful to take something is a bit more intensive.” (TG03A) “The organization of a CPD activity is important to ensure there are appropriate goals and activities to meet these goals” (CP07M)

Factor 2: Application and competency-based learners	**Intrinsic motivation to stay clinically competent** “As a certified (occupation redacted) I need regular continuing ed (Education)” (KT04A) **Extrinsic motivation to stay clinically competent** “Mandatory regulation is the main reason for selecting one program over another in terms of "density" of MainPro Credits earned” (AX25M) “Required to maintain my licence - must be done” (EN10M) **Prioritizing Clinical Topics** “(On using CPD as a mental health resource) I use hobbies and reading and exercise for that purpose. CPD is part of work. (EL3M)
Factor 3:Respite seekers	**Refresh professionally**

	"I find learning highly refreshing. When I notice I am struggling I make sure that I find some CPD to engage in. I also know that it benefits me to have a few more substantial spread throughout the year so that I have something coming up that is for me." (BM02A) "Its a break from patients - feeds my educational side to give my "teaching" side a rest & learning can be fun." (LA06A) "I enjoy these activities" (QQ11N)
Factor 4: Growth-oriented professionals	No supplementary statements