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Implementing learning into practice from continuous professional development activities: a scoping review of health professionals' views and experiences

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Abstract

Purpose Continuing professional development (CPD) is an approach for health professionals to preserve and expand their knowledge, skills, and performance, and can contribute to improving delivery of care. However, evidence indicates that simply delivering CPD activities to health professionals does not lead to a change in practice.

This review aimed to collate, summarize, and categorize the literature that reported the views and experiences of health professionals on implementing into practice their learning from CPD activities.

Methods This review was guided by the Joanna Briggs Institute Reviewers' Manual methodology for scoping reviews. Three databases, PubMed, Embase and Cumulative Index to Nursing and Allied Health Literature (CINAHL), were systematically searched in February 2023 for articles published since inception. Two independent reviewers screened the articles against the inclusion criteria, and completed the data extraction. Data were summarized quantitatively, and the findings relating to views and experiences were categorized into challenges and facilitators.

Results Thirteen articles were included. Implementation of learning was not the primary focus in the majority of studies. Studies were published between 2008-2022; the majority were conducted in North America and nurses were the most common stakeholder group among Healthcare Professionals (HCPs). Five studies adopted qualitative methods, four quantitative studies, and four mixed-methods studies. The reported barriers of implementation included lack of time and human resource; the facilitators included the nature of the training, course content and opportunity for communal learning.

Conclusion This review highlights a gap in the literature. Available studies indicate some barriers for health professionals to implement their learning from CPD activities into their practice. Further studies, underpinned with appropriate theory and including all relevent stakeholders are required to investigate strategies that may facilitate the integration of learning from CPD into routine practice.

Keywords Continuing professional development, Healthcare professionals, Implementation, Scoping systematic review

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Background

Continuing professional development (CPD) refers to the ongoing process through which healthcare professionals partake in activities aimed at preserving and expanding their knowledge, skills, and performance [1, 2]. It

also involves cultivating the personal and professional attributes necessary for delivering safe and effective services, ultimately with the aim of optimizing care for the improvement of community health [3–5].

The requirement to complete an ascribed number of CPD hours on an annual basis has been adopted by licensing and regulatory bodies across various health professional bodies around the world, including those in the United Kingdom, United States, Canada and New Zealand [6–9].

Systematic and coordinated planning is fundamental in the development of CPD activities; adult learning principles of autonomy, self-directed, goal-orientated, and practice-based learning should serve as the blueprint for CPD design [10, 11]. Further, the four stages of CPD learning process provides a framework for clinicians to prioritize and measure the success of CPD activities: review; *plan; implement; and evaluate and reflect* [12]. The review and planning stages often involve a self-directed assessment of individual performance, skill and knowledge in the context of one's own practice (and likely future practices), and then to identify specific learning needs and the necessary learning activities to address those needs [12, 13]. The implementation stage entails integrating the skills/knowledge attained from the learning activity into one's routine clinical practice [12]; and has been defined more specifically as the process by which learning is put into practice, connecting research and evidence directly to actions within one's practice, this includes application of new learning to improve outcomes within one's own setting [14]. The final stage involves evaluation and reflection on the impact of the learning activity on the service delivery [12, 15].

All stages of the CPD learning process are challenged by many factors that act as barriers that should be addressed for successful learning and subsequent positive impacts within the healthcare system [16–19]. The reported positive impacts from CPD are numerous, indeed a 2019 scoping review categorizing the broad impacts of CPD identified 12 categories including *knowledge*, *practice change*, *skill*, *confidence*, *attitudes*, *career development*, *networking*, *user outcomes*, *intention to change*, *organizational change*, *personal change and scholarly accomplishments* [15]. Achieving these impacts are by no means guaranteed, even though significant economic costs and resources are invested in the design and delivery of CPD programs to support achieving the intended goals [20–22]. Therefore, in the current challenging times for healthcare delivery, with regards to economic constraints and workforce shortages, it is essential that each stage of the CPD learning process is comprehensively evaluated and optimized to enhance the effectiveness of CPD.

Published reviews have focused on the evaluation of CPD programs [23–26], but a preliminary search of MEDLINE, the Cochrane Database of Systematic Reviews and JBI Evidence Synthesis was conducted and no current or underway systematic reviews or scoping reviews on the implementation of learning from CPD activities were identified.

Implementation, in the context of healthcare interventions, refers to the extent to which health interventions can be effectively integrated within real-world public health and clinical service systems [27]. There is an increasing number of studies focussing on investigating the factors influencing the implementation of new interventions in healthcare, often utilizing implementation theories and frameworks to guide research [28–32]. One such framework that has gained prominence is the Consolidated Framework for Implementation Research (CFIR) [33], utilized in multiple implementation studies [34–39].

CFIR provides a structured approach to identifying and understanding the factors that influence the implementation of innovations in healthcare. It categorizes these factors into five key domains: intervention characteristics, outer setting, inner setting, characteristics of individuals, and processes [33]. By using CFIR, researchers can systematically explore the complexities of implementing changes in practice, such as those arising from CPD learning, and identify barriers and facilitators to successful integration.

Given the growing recognition of the importance of implementation science in healthcare and evidence suggesting that knowledge alone does not necessarily lead to changes in clinical practice [40], there is a critical need to better understand how learning from CPD activities is actually put into practice. Investigating the implementation of learning is essential for identifying the factors that enable or hinder the translation of knowledge into actionable changes in clinical settings. This understanding is crucial for optimizing CPD programs to ensure that the time, effort, and resources invested in professional development lead to tangible improvements in healthcare delivery and patient outcomes.

This review aims to collate, summarize, and categorize the literature reporting on the experiences of healthcare professionals in implementing learning from CPD activities, using CFIR as a guiding framework to enhance our understanding of these processes.

Aim

The aim of this scoping review was to collate, summarize, and categorize the literature that reported investigating the views and experiences of healthcare professionals'

on implementing into practice their learning from CPD activities.

Methods

This scoping review was guided by the Joanna Briggs Institute (JBI) Reviewers' Manual methodology for scoping reviews [41] and was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist [42]. The study protocol was registered in the Open Science Framework database (Registration number: 4se2c).

Eligibility criteria

The review included published studies answering the following research question (based on the *Population/Concept/Context*): What does the literature report regarding health professionals' views and experiences on implementing into practice their learning from CPD activities?

Population

Studies were included if they were conducted with CPD activity participants who were registered health professional; studies conducted with students (either undergraduate or postgraduate) enrolled on academic programs were excluded.

Concept & context

Studies were included if they investigated views and/or experiences in the context of implementing learning from CPD participation into practice. Studies measuring or reporting on the impact of the CPD activity were excluded as were studies investigating the development or validation of tools to evaluate CPD activities.

Only studies published in English were included and there were no date limitations applied to the search. All study designs were considered, except for reviews. Letters, commentaries, perspectives, calls for change, and editorials were also excluded.

Information sources and search strategy

A preliminary search of PubMed was conducted to identify articles on the topic. The words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy for the following electronic databases: PubMed, Embase and Cumulative Index to Nursing and Allied Health Literature (CINAHL) (see Appendix 1 for full details of the search). The search strategy, including all identified keywords and index terms were adapted using appropriate Boolean operators AND OR combined with truncation for each of the databases. The reference lists of all included articles were also screened for additional studies. Databases were searched independently by two reviewers between February 13th and February 17th 2023.

Study/source of evidence selection

Following the search, all identified citations were collated and uploaded into EndNote X8VR® and duplicates were removed. These sources were then imported into the Intelligent Systematic Review platform Rayyan Qatar Computing Research Institute (QCRI) web application [43]. Two independent reviewers screened the titles and abstracts against the inclusion criteria, similarly full-text screening was then conducted by two independent reviewers. Disagreements were discussed between the two reviewers, and if necessary were resolved through consultation with a third reviewer.

Data extraction

A data extraction tool was developed to align with the aim of the review. The extracted data included date of study, country, setting, health profession group, study design, time of data collection, and reported views and experiences. The tool was piloted by two reviewers using three of the included studies. This resulted in minor refinements being made to the tool to capture further details regarding the duration of the study. Two reviewers independently completed the data extraction of the included studies. Disagreements were resolved through discussion and if necessary, consultation with a third reviewer (Appendix 2 contains full details of the data extraction).

Data analysis and presentation

Data were summarized quantitatively and qualitatively in relation to review aim. Frequency analysis based on numerical counts of key characteristics (including healthcare professional group, setting and geographic location) were extracted and presented in tabular format. The included studies were reviewed independently by two reviewers to identify findings relating to views and experiences; these were categorized into challenges and facilitators.

Results

The database search returned 445 articles. After excluding duplicates, and screening against the aforementioned inclusion criteria, 13 articles were included in the review. (Fig. 1 presents the PRISMA-ScR flow chart of the literature search and study selection process and Appendix 2 provides further details of articles excluded following full-text review).

The following sections provide an overview and descriptive summary of the included studies.

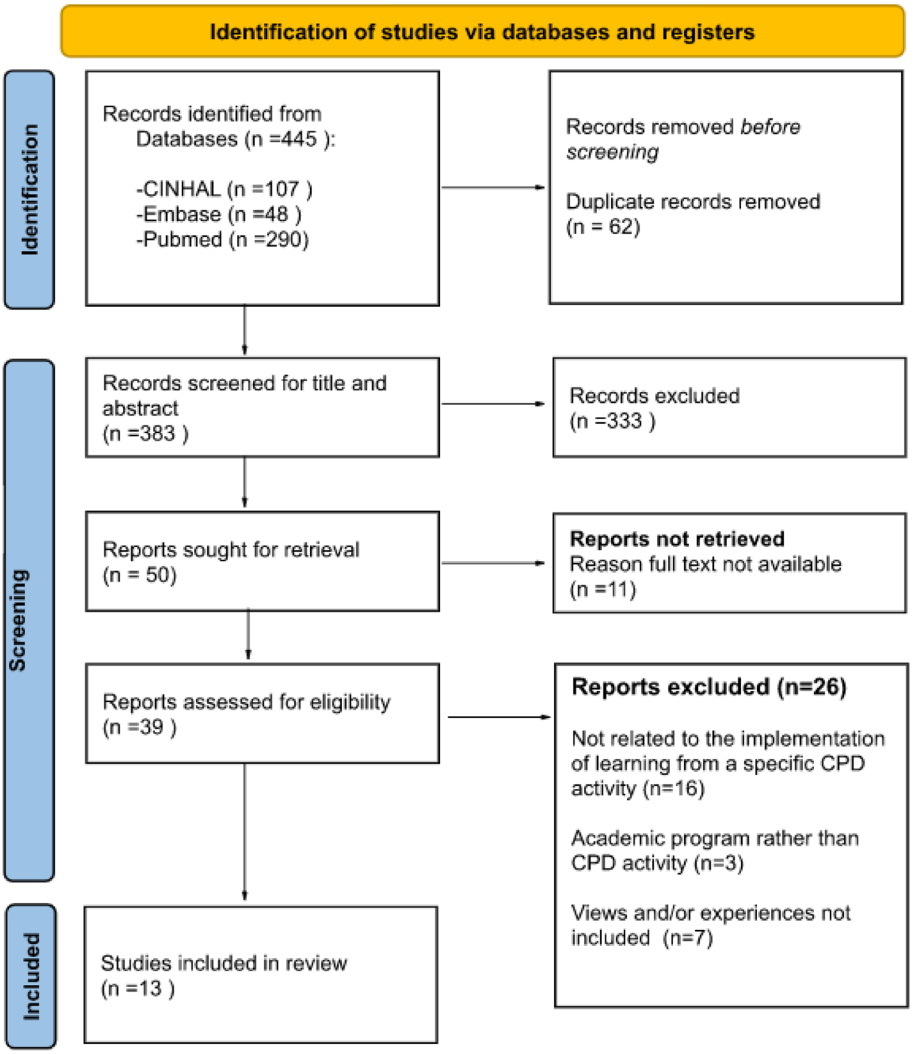

Fig. 1 PRISMA Flowchart of the literature search and study selection process for the scoping review on the views and experiences of health professionals' on implementing into practice their learning from CPD activities

Descriptive summary of the included studies

Table 1 provides a summary and Table 2 provides more detailed characteristics of the 13 studies included in the scoping review.

Studies were published between 2008 and 2022. Most of the studies were conducted in North America, with Canada and the USA accounting for six of the total studies.

Investigations included CPD activities targeting health professionals working in a range of settings, including primary ($n=4$), secondary ($n=5$) and tertiary care ($n=1$). However, in three studies, the setting was not specified.

In the majority of studies, the CPD activity was delivered to an audience consisting of multiple healthcare professional (HCPs) groups ($n=8$) where the reporting of views and experiences of participants were pooled together. The sample of study participants ranged considerably, from a qualitative study that included a sample of nine perioperative nurses [48], to a mixed methods study that included 222 multidiscpilanary participants attending an interprofessional diabetes champion course [52]. Nurses were the most common stakeholder group among HCPs, appearing in four of the studies. Pharmacists were the second most common group, appearing in three of the included studies. Investigations also included leaders, managers, and directors, who were participants in three studies.

Methods used to capture views and experiences

Five of the studies adopted qualitative methods for data collection, including one-to-one semi-structured

Table 1 Summary of the 13 studies included in the scoping review on categorizing the views and experiences of health professionals' on implementing into practice their learning from CPD activities

Country			
Canada	3	USA	3
Brazil	1	Ireland	1
Portugal	1	Laos	1
Ethiopia	1	Rwanda	1
Multiple countries	1		
Setting targeted by CPD activity			
Primary care settings	4	Secondary care settings	5
Tertiary care settings	1	Unspecific	3
Target audience for CPD activity			
Pharmacists	1	Physicians	1
Nurse/nurse educator	2	Dental hygienists	1
Mixed audience (consisting of multiple healthcare professional groups)			8
Time of data collection			
Within 1 month post CPD activity	1	Between 1–3 months post CPD activity	2
Between 4–12 months post CPD activity	3	Between 13–24 months post CPD activity	2
Multiple time points post-CPD activity	3	Not stated	2
Methods used to capture views and experiences			
Qualitative: One-to-one interviews	3	Quantitative: Survey	4
Qualitative: Descriptive analysis	1		
Qualitative: Focus groups	1	Mixed -methods	4
Use of theory/model/framework to underpin investigation			
Wenger's social learning theory	1	Theoretical Domains Framework	1
Kirkpatrick model of evaluation	1	Moore's evaluation framework	1
Multiple theory/model/frameworks	1		

interviews ($n=3$) [46, 48, 54] focus groups ($n=1$) [44], and descriptive analysis of participants' written Strenghts Weaknesses Opportunities Threats (SWOT) evaluation ($n=1$) [45]. There were four studies utilizing cross-sectional surveys; and a further four studies using mixed methods, of which three were of sequential explanatory design consisting of an initial quantitative survey followed by qualitative interviews [47, 52, 56], and one study consisting of analysis of medical records and semi-structured interviews [53].

In the majority of studies, implementation of learning was not the primary focus; rather it was an aspect of wider investigations, in varying extents, that were conducted with CPD participants to assess or evaluate elements of the CPD activity. A review of the specific data collection tools reveals the extent to which studies were focused on implementation of learning. In many of the cross-sectional surveys, implementation of learning was captured using 1–2 items; whereas more comprehensive investigations occurred in the qualitative studies which sought to examine indiduals' reported barriers and facilitators of implementing learning to a greater extent.

The time after the CPD activity at which investigations took place varied across the studies. Investigations took place within one month of the CPD activity [44], between one and three months [52, 56], between four and twelve months [52, 54, 55] and between 13 and 24 months [45, 47]. In two studies, the time point for data collection was not mentioned [46, 48]. In three of the studies, investigations took place at multiple intervals after the CPD activity, attempting to explore both immediate and longer-term implementation of learning into practice [50, 52, 53]. These studies included administration of a post-activity survey immediately after the CPD activity and then, either re-administration of the survey after three months [50], or phone interviews with a sample of respondents within three months [52]. One study conducted an analysis of medical records immediately after the CPD activity to evaluate the level of participants' implementation into learning, and these participants were then recruited to participate in focus groups six months later to investigate their views and experiences [53].

Table 2 Detailed characteristics of the 13 studies included in the scoping review on categorizing the views and experiences of health professionals' on implementing into practice their learning from CPD activities

Article	Setting & participants	Study design	Key findings	Limitations
A controlled investigation of continuing pain education for long-term care staff. Ghandehari et al. 2013 [44]	Long-term care staff members (nurses & special aides), Canada.	Mixed-methods:. Knowledge and attitudes/ beliefs were assessed before, immediately after and two weeks following the program. Focus groups with a sample of participants gauged the barriers to implementing learning.	Interactive pain education program was effective in improving pain-related knowledge and attitudes/ beliefs, both immediately after the program and at the two-week follow-up. Participants identified barriers to implementing pain-related strategies, such as time constraints and lack of resources.	High turnover rate among the staff, resulting in a different samples responding to survey questionnaires pre- and post-intervention.
Analysis of a Blended, In-Service, Continuing Education Course in a Public Health System: Lessons for Education Providers and Healthcare Managers. Manzini et al. 2020 [45]	Course faculty, and pharmacist CPD participants, Brazil	Thematic analysis of group SWOT analysis discussions, followed by an online survey to seek perceived agreement and importance of the derived themes. Conducted 2 years after the workshop.	The reported "strengths" facilitating implementation of learning included the use of E-learning in CPD. In-service hands-on activities directly related to the professionals' roles, course contents, faculty, and the methods to offer the course were reported facilitators. Other critical factors included investments in the infrastructure of pharmaceutical services, access to the internet, local managers' support for continuing education and innovation implementation, practice of interprofessional collaboration, and political stability.	Limited time available in the workshops may have constrained the discussions. The findings of this study might not lend themselves to generalization over other social, political, and economic conditions.
Applying a social theory of learning to explain the possible impacts of CPD programs. Allen et al. 2020 [46]	Multi-professional. Multiple countries.	Individual semi-structured interviews.	The authors identified five themes that illustrated the broad impacts of attending CPD programs that focus on social learning: (1) enhanced professional identity; (2) improved practice; (3) increased confidence; (4) strengthened relationships; and (5) enhanced organizational impact.	The underpinning theory may have been inadequate to fully describe the complexities of learning. Further research to investigate generalizability of findings.
Barriers and facilitators to implementing a continuing medical education (CME) intervention in a primary health care setting. Reis et al. 2022 [47]	Primary Health Care General Practitioners (GPs), Portugal	Mixed-methods: Questionnaires informed by the Barriers and Facilitators Assessment Instrument (BaFAI), distributed at baseline and 12-months post-workshop. Followed by semi-structured interviews.	GPs reported the main barriers to implementing learning from CME, a lack of time, a perception of work overload, a lack of digital competence, a lack of digital infrastructure, and motivational and emotional factors. They reported as facilitators, CME delivered through a digital interface to enhance convenience of the delivery method, and to focus on the practical and pragmatic characteristics of the content.	Small sample size.

Table 2 (continued)

Article	Setting & participants	Study design	Key findings	Limitations
Building the Case for Nurses' CPD in Ethiopia: A Qualitative Study of the Sick Kids-Ethiopia Paediatrics Perioperative Nursing Training Program. Abebe et al. 2018 [48]	Perioperative nurses, Ethiopia	Semi-structured interviews	Participants stressed key challenges including lack of access to ongoing perioperative in-service training and problematic staffing policies that impact perioperative nurses' ability to fully utilize and share new knowledge gained during CPD training.	Small sample size. Only nurses working in the operating room in Addis Ababa public hospitals were included.
Can a Clinical Continuing Education Course Change Behavior in Dental Hygiene Practice? Young et al. 2008 [49]	Dental hygienists USA	Quantitative survey distributed 6 months following the final course.	The majority of respondents reported moderate to high gains in knowledge and skills as well as application to patients in practice. The majority also identified continuing education as the primary source of information used when making changes in practice.	Limited generalizability of findings, due to: recall bias, self-reporting bias, context-specific, no control group, concerns about the reliability and validity of the questionnaire instrument.
Delivering information skills training at a health professional CPD conference: an evaluation. Lawton et al. 2017 [50]	Multi-professional, Ireland	Post workshop cross-sectional survey, and 3-month follow-up.	Three-month follow up survey indicated that attendees continued to use the information provided, with some reporting that it had saved them time and influenced their decisions on patient care and practice.	Small sample size and low response rate. The survey instrument relied on subjective self-evaluation and satisfaction.
Effect of a primary care continuing education program on clinical practice of chronic obstructive pulmonary disease: translating theory into practice. Adams et al. 2012 [51]	Primary care teams, USA	Pre-post assessment of self-confidence, and knowledge. 3–6 month follow-up survey to investigate change in practice, and barriers to change.	Self-confidence, and knowledge significantly improved. Majority reported change in practice. Most frequently cited barriers: time limitations, limited resources, lack of fiscal support, difficulty remembering to incorporate into daily routine, organizational, and inadequate knowledge.	Low response rate, with non-responders possibly uncomfortable reporting their inability to implement changes.
Evaluation of an interprofessional CPD course on comprehensive diabetes care: A mixed- methods approach. Beckman et al. 2019 [52]	Multi professional primary care teams in the military health system. USA	Mixed methods: pre- & post- course surveys to assess knowledge, skills and intention to change clinical practice. Semi-structured interviews to investigate benefits and barriers related to implementation	Knowledge & skills-based questions showed significant improvement. Majority of respondents reported implementation resulting in benefits to patient care and multidisciplinary working. Reported barriers included staff turnover or loss, lack of time, under manning/overworked, provider pushback, lack of leadership support, knowledge deficits, system issues, underutilization of resources/team members, and communication.	The majority of attendees were nurses, potentially introducing bias, and there was a low response rate.

Table 2 (continued)

Article	Setting & participants	Study design	Key findings	Limitations
Mixed-methods evaluation of a continuing education approach to improving district hospital care for children in Lao PDR. Safe et al. 2022 [53]	Hospital staff at two district hospitals. Laos	A comparative case study using mixed methods investigated using focus groups and individual interviews conducted 6 months after the training.	Inpatient case management scores showed incremental improvement over time. Key facilitators for implementation of learning included the value of the educational method and subsequent increased belief in capability; and directors demonstrating modelling and behavioral reinforcement. Barriers included lack of staff availability.	The evidence for change is based on only small numbers of case records at each visit.
Nurses' and nurse educators' experiences of a Pediatric Nursing CPD program in Rwanda. Olson et al. 2022 [54]	Nurses and nurse educators. Rwanda	Individual semi-structured interviews conducted 6 months after the training.	All participants reported implementation of learning. Reported facilitators included institutional support, internal motivation, knowledge sharing opportunities. Barriers included: lack of human resource and equipment, workplace culture.	No mention steps taken to validate semi-structured interview guide.
Performance Change in Treating Tobacco Addiction: An Online, Interprofessional, Facilitated Continuing Education Course Evaluation at Moore's Level 5. Ivanova et al. 2021 [55]	Multi professional Canada	Pre–post (6 month) quasi-experimental mixed-methods study with four online cohorts of HCPs.	6-month follow-up indicated majority of participants indicated implementation of learning.	The study did not include a concurrent control group that did not receive training.
Responsiveness of a simple tool for assessing change in behavioral intention after CPD activities. Légaré et al. 2017 [56]	Multi professional primary care clinicians. Canada	Pre-& 3-month post- survey using the CPD-Reaction questionnaire to evaluate responsiveness to change in behavioral intention.	Majority of participants reported implementation of learning. There was an increase in score for all constructs post-activity with the most appreciable increase for the construct *beliefs about capabilities.*	Lack of a control group; a low three-month follow-up response rate; small sample size.

Use of theoretical models/frameworks

Five studies utilized theoretical models or frameworks within their studies, however, the context of their use was not to specifically capture implementation of learning [45, 50, 53, 55, 56]. Two studies used an evaluation framework/model: the Kirkpatrick model was used to develop a survey that aimed to evaluate participants' perceptions of the effectiveness of the CPD activity [53]; in a separate study, the Moore's evaluation framework was adapted to evaluate participants' sustained performance change [55]. A behavioural frameworks was used in one study: the Theoretical Domains Framework was used to develop an interview guide in a study investigating participants views of the barriers, facilitators and perceived impact of the CPD activity [53]. One study used Wenger's social learning theory to investigate the range of social learning impacts that are possible because of attending a CPD activity [46].

One study assessing whether implementing learning from CPD influenced HCP's clinical behavioural intentions, developed a survey combining a number of theories including the Theory of planned behaviour and the Triandis theory [56].

Health professionals' view and experiences

Table 3 Presents the themes and a summary of findings of included studies investigating views and experiences of health professionals'. The views and experiences of health professionals' regarding implementation of learning into practice were categorised into: *Challenges of implementing learning from CPD activities into practice*; *Facilitators of implementing learning from CPD activities into practice.*

Discussion

Summary of key findings

This review has collated, summarized, and categorized healthcare professionals' views and experiences regarding implementing learning from CPD activities into their practice. The work provides researchers and CPD developers insights into current practices and areas for future studies.

The key findings of this review relate to the lack of studies that set out to specifically and systematically investigate the implementation of learning from CPD activities. This was evident through the nominal focus implemenentation was afforded within included studies and by the absence of implementation theory to underpin investigations. Those studies reporting on implementation of learning focussed on highlighting the challenges, of which time and human resource were frequently reported; and to a lesser extent, the facilitators where the focus was more aligned to the nature of the training, course content and opportunity for communal learning.

Interpretation of findings

While healthcare professionals may actively participate in well-designed CPD programs, the lack of implementation-focused research hinders understanding of the extent to which learning from CPD activities is implemented and the full range of factors that are frequently implicated. This is in contrast to other aspects of CPD that have been more extensively explored and reported in systematic and scoping reviews, such as approaches to learning needs assessment to inform CPD [59], and evaluation of effectiveness of CPD activities [60–62].

Despite five of the included studies adopting a theoretical underpinning, there were not any studies that utilised implementation theory. The use of theory to support research in healthcare and education has been widely advocated [63–66]. It has been reported that incorporating theory enhances the comprehensiveness of investigations allowing for exploration of the complex interplay of variables and concepts [67]. Further to this, the adoption of implementation theory has the potential to elicit greater insights into the full range of factors that act as influencers of the phenomenon being examined and thus providing rich data on specific aspects that may require further refinemenet [68, 69]. Thus, it can be seen from the literature that the use of theory in intervention implementation, is more likely to result in effective and sustained interventions [70, 71].

One recent scoping review in the domain of learning health systems, which includes CPD initiatives, revealed a distinct lack of comprehensive reporting of implementation efforts, and subsequently concluded that implementation determinants are poorly understood [72]. The review also identified few studies had adopted implementation theories, models or frameworks, and thus recommend their use in future research to provide a structured approach to plan, implement, and evaluate interventions, including those in the area of training and education.

The Consolidated Framework for Implementation Research is specifically designed to systematically assess barriers and facilitators in implementation within local settings and can guide decisions regarding the needs within a local context [73]. Other implementation frameworks include the Proctor taxonomy of implementation outcomes [74] and RE-AIM [75], and have also been applied to the health domain to evaluation implementation. To guide optimization of processes and programs, the CPD field would benefit from employing such frameworks within its processes and programs as part of the initial planning, ongoing assessment and summative evaluation.

Table 3 Summary of the reported views and experiences of health professionals' on implementing into practice their learning from CPD activities

Views and experiences of health professionals' on implementing into practice their learning from CPD activities.	Study findings
Challenges of implementing learning from CPD activities into practice	Inadequate time [44, 49, 50, 52, 54] Inadequate human resources [44, 47, 52, 54] Inadequate equipment/space [47, 53, 54, 57] Communication breakdown [44, 45, 52] Political instability [45] Precarious working conditions [45] Lack of Interprofessional collaboration [45] Complexity of educational concepts [47, 50, 52] Patients not cooperating [47] Lack of eligible service users [47, 52] Lack of personal motivation [57] Lack of incentive [57] Inadequate feedback [49] Perceived lack of need to use the learning [50] Lack of leadership support [52] Workplace culture [54]
Facilitators of implementing learning from CPD activities into practice	Favourable political scenario [45] Comprehensive training & training materials [50, 53] Social influences of communal learning [53] Increased self-efficacy [53, 58] Strong leadership [53] Institution support [54] Personal motivation [54]

In the relatively small number of articles to report on implementation of learning from CPD into routine practice, only three studies followed-up with CPD participants at multiple time points, the majority of studies were conducted at a single time point between 1 and 24 months after a CPD activity. This likely reflects the lack of consideration concerning assessing both the early stages of implementation which includes assessing the feasibility, appropriateness, acceptability, and adoption as well as the long-term sustainability and penetration of the learning into routine practice [76]. Nevertheless, the included studies reported on the barriers and facilitators to implementing their learning from CPD activities across different settings which can begin to inform CPD develops and health institutions to overcome barriers. Contextual factors relating to inadequate time, human resource and communication breakdowns were the most frequently cited issues. However, the complexity of the educational concepts was also a frequently reported barrier, as CPD participants often found that the learning content was not delivered in a manner that facilitated easy application into their clinical practice. A 2018 scoping review assessing the barriers and facilitators to self-directed learning in CPD fpr physicians in Canada identified similar challenges related to time restrictions, and competing demands and interests. The study also cited amongst other barriers, a shortage of academics with the required knowledge and experience in team training [77]. Understanding these challenges is essential to enhancing the potential benefits from CPD programs and subsequently result in sustainable improvements in health care delivery.

In the few studies reporting potential facilitators, comprehensive training and training materials was most frequently mentioned. This finding underscores the need for integrating established learning pedagogies, particularly adult learning principles such as those proposed by Knowles, into the design and delivery of CPD programs [8, 78, 79]. Knowles' principles, which emphasize self-directed learning, relevance, practical application, and the immediate utility of new knowledge, are crucial for creating CPD experiences that lead to discrete and actionable learning outcomes. Greater consideration and integration of these principles can enhance the effectiveness of CPD activities by making them more relevant and directly applicable to healthcare professionals' daily practices.

A valuable resource in this context is a published quick guide for health professional educators on the use of adult learning theories, which provides an overview of various adult learning theories and their potential application in healthcare education [11]. This guide highlights the importance of aligning educational practices with learning theories, advocating for a deliberate

connection between how CPD is designed and the adult learning needs of participants. Using such resources can significantly enhance the impact of CPD by fostering more engaging, relevant, and effective learning experiences that are directly translatable into practice.

It is important to note that the majority included studies originated from the United States and Canada; the implementation of learning from CPD and the priority that CPD is afforded within health systems across the world is likely to vary significantly. Therefore, the relevance and transferability of these findings to other contexts may be constrained.

Strengths and limitations

While previous reviews have explored various aspects of CPD, this scoping review is the first to specifically examine the implementation of learning from CPD activities into practice. This focus on the practical application of CPD learning distinguishes our review from others that primarily assess the efficacy or outcomes of CPD programs.

A key strength of this work is the comprehensiveness of the search. In order to capture all relevant findings, studies were included that may have implicitly reported on implementation of learning. (A summary of the studies where the full text was reviewed and the reasons for exclusion is presented in Appendix 2). The heterogeneity of the retrieved studies presented challenges in synthesizing the findings, therefore where reviewers suspected that study findings were lacking clarity or could be misinterpreted, they were discussed between themselves in the context of the wider investigation.

However, the findings of this review are limited by the focus on studies conducted predominantly in North America, which may limit the generalizability to other healthcare systems. A wider selection of databases, such as ERIC, may have yielded further relevant studies. Similarly, incorporating grey literature, forward citation searches, and not restricting articles to English-language only, may have limited the scope of captured studies.

Further research and recommendations

This review raises the important question of why there are so few studies reporting the perspectives and experiences of health care professionals regarding the implementation of CPD in practice, despite the importance of the recent CPD literature for CPD development and design. To answer this query accurately and comprehensively, further multistakeholder investigations should be conducted and supported with relevant implementation theory, such as the CFIR. Furthermore, longitudinal studies, such as those conducted within health services research [80, 81], should be considered to elucidate issues that occur both at the early and later stages of implementation, thus providing insights that can inform sustained use of learning from CPD activities.

Additionally, CPD organizers should consider periodic follow-up evaluations to assess long-term outcomes and address barriers such as time constraints, lack of resources, and institutional support. These strategies can help ensure that CPD activities lead to meaningful changes in clinical practice.

Supplementary Information

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Supplementary Material 1.

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