

CHAPTER 7

A REVIEW OF CONTINUOUS PROFESSIONAL DEVELOPMENT PROGRAMMES FOR INTERPROFESSIONAL COMPETENCIES OF INTENSIVE CARE TEAMS

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Abstract

Professionals in intensive care units (ICU) care for patients facing life-threatening situations; ensuring patient safety and high-quality care for critically ill patients requires ICU teams to work together in interprofessional teams that rely on effective interprofessional skills. This chapter presents the findings of the integrative literature review guided by the question: What is available in the literature on continuous professional development programmes aimed at enhancing the interprofessional competencies of ICU teams? An integrative literature review outlined by Whitemore and Knafl (2005) was performed. Four electronic databases, namely Cochrane Library, CINAHL, ScienceDirect, and PubMed, were searched to find relevant articles published articles, using the search terms “continuous professional development programmes”, “interprofessional competencies”, “interprofessional collaborative practices”, and “intensive care teams”. The retrieved articles underwent rigorous screening and quality appraisal based on the research inclusion criteria for the review, resulting in 19 peer-reviewed articles that qualified for thematic analysis. The review shows that continuous professional development (CPD) programmes that improve the interprofessional competencies of ICU teams are designed based on the needs and clinical gaps identified in the ICU through conducting situational analyses. The situational analysis guides the learning outcomes, the programme's teaching strategies, learning activities, and how the competence and success of the programme are to be evaluated. Various multidimensional assessment tools and approaches, such as reflective team discussions, are recommended. Additionally, when correctly implemented, the CPD programme supports patient safety and fosters a positive psychological environment, which helps improve team cohesion and job satisfaction.

Keywords: continuous professional development programmes, interprofessional competencies, interprofessional collaborative practices, intensive care teams.

1 Introduction

Patients in intensive care unit (ICU) settings receive care from various medical and healthcare professionals according to their diagnoses and treatment requirements. Interprofessional care necessitates that healthcare personnel in the ICU collaborate efficiently to protect patient safety and guarantee favourable outcomes for critically ill individuals (Sedighi Nezhad & Mahmoudi, 2023:6; Vaseghi et al., 2022:496). Attaining superior patient-centred care requires effective interprofessional communication, collaborative leadership, and cooperation (Andersen et al., 2023:1119556; Goldman & Xyrichis, 2020:580; Loura et al., 2021:63). Moreover, it necessitates robust team values, ethics, well-defined roles and duties, and mutual trust and respect, all essential for efficient interprofessional collaboration practices in an ICU (Loura et al., 2021:2). Consequently, fostering interprofessional abilities in an ICU environment is a crucial and requisite measure to improve advanced interprofessional collaboration in ICUs (Vaseghi et al., 2022:496). Interprofessional competencies are crucial for fostering interprofessional identity and culture within interprofessional ICU teams. Furthermore, interprofessional abilities enhance the quality and cost-effectiveness of key healthcare services through accountable care practices that mitigate unfavourable outcomes and foster patient-centred care (Boltey et al., 2023:857). Thus, any project that improves interprofessional competencies in an ICU requires assessment and execution. This article presents the results of an integrative literature analysis addressing the question: What literature exists regarding continuous professional development programmes to enhance the interprofessional capabilities of ICU teams?

2 Background

Continuous professional development (CPD) is essential for healthcare practitioners. CPD programmes are continuous, self-directed, systematic, and outcome-oriented learning tools for professional enhancement (King et al., 2021:104652). In healthcare, CPDs are educational programmes that are

characterised by several definitions. This may be termed workforce development, continuing medical education, or ongoing education (Beasley, 2021:240). The CPD programmes in healthcare seek to maintain the information and skills healthcare workers acquire. It additionally promotes competence by mandating essential skills pertinent to the job profile or by including new skills that facilitate safe and high-quality healthcare practices (Khatri et al., 2021:15; King et al., 2021:104652; Vázquez-Calatayud et al., 2021:102963). The CPD programmes are strongly endorsed for improving public safety against inadequate care, which may result in harm (King et al., 2021:104652). In CPD programmes, healthcare professionals gain knowledge, skills, and attributes through diverse activities, including experiential learning at the bedside, observation, collaboration with interprofessional teams, or participation in formal teaching programmes (Khatri et al., 2021:15). In most healthcare professions, CPD programmes are associated with licensure and governed by regulations established by regulatory councils. This allows healthcare personnel to continuously learn within their positions (Khatri et al., 2021:15).

Critically sick patients in the ICU are clinically and psychologically vulnerable. Minor errors in care can result in considerable morbidity and mortality events (Kendall-Gallagher et al., 2017:20; Donovan et al., 2018:980). The complexity of the ICU necessitates extremely efficient and effective interprofessional collaboration among varied team members. Critically ill patients rely on the specialised knowledge, abilities, and qualities of an interprofessional team to operate cohesively, collaboratively, and effectively, hence enhancing their chances of survival and care in an ICU (Kendall-Gallagher et al., 2017:20). Interprofessional collaboration in the ICU entails effective relationships and shared objectives that encompass complementary and interdependent responsibilities, mutual trust, respect, and power-sharing (Schmid et al., 2022:381). The authors utilised the six competency domains from the Canadian Interprofessional Health Collaborative (CIHC) framework, depicted in Figure 7.1, to elucidate the fundamental competencies necessary for delivering quality care and enhancing professional collaboration (CIHC, 2024:1).

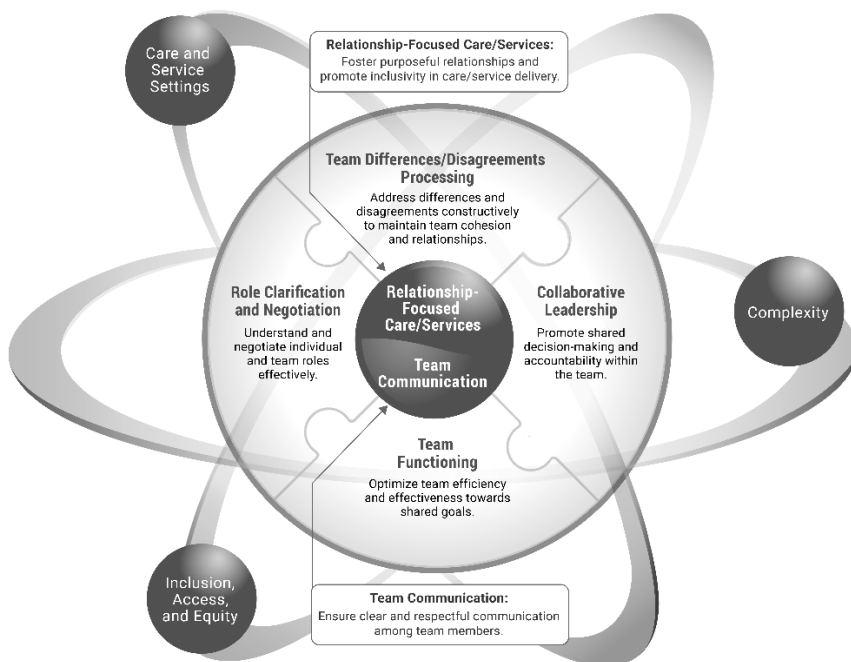


Figure 7.1: Canadian Interprofessional Health Collaborative Competency Framework for Advancing Collaboration 2024. Source: (CIHC, 2024:1); www.cihc-cpis.com

The CIHC Competency Framework for Advancing Collaboration (CIHC, 2024:1) emphasises six competency areas. It delineates the knowledge, abilities, attitudes, and values that inform the judgements and behaviours critical for collaborative practice. The relationship-oriented care/services and team communication domains are central to the framework. Clarification of roles and negotiation, team dynamics, processing of differences and arguments, and collaborative leadership are vital for fostering relationship-centred care/services and effective team communication. In this study, the inability to foster relationships in the ICU adversely affects effective interprofessional teamwork. Interprofessional conflict may arise from unaddressed power dynamics, poorly managed and negotiated roles and responsibilities, and inadequate strategies for resolving differences and disagreements constructively, thereby undermining team cohesion and trust (Michailidou, 2021:14; Palma et al.,

2022:24; Stollings et al., 2020:562). Consequently, interprofessional collaboration practices are implicated, resulting in inadequate communication across interprofessional teams, interprofessional tension, conflicts, and incivility among ICU team members (Schmid et al., 2022:381). The treatment administered to critically sick patients become fragmented or task-oriented rather than holistic, characterised by shared decision-making and team accountability (Palma et al., 2022:24). Literature indicates that insufficient interprofessional competencies and their application to guarantee safe and quality care in the ICU are regarded as the primary factors contributing to interprofessional conflicts, inadequate communication, and a deficiency in collaborative practices (Dunn et al., 2018:284; Goldman & Xyrichis, 2020:580; Goldman et al., 2018:407; Schmid et al., 2022:381). Goldman and Xyrichis (2020:580) contend that interprofessional ICU disagreements adversely impact team communication. This further involves team consultation, team-based diagnosis, planning, and execution of patient-centred care delivery. Consequently, increased tension and conflicts would likely result in interprofessional arguments over decision-making among team members, affecting a patient's treatment and quality of care in an ICU (Goldman & Xyrichis, 2020:580).

The Framework for Advancing Collaboration (CIHC, 2024:1) identifies three important criteria that facilitate interprofessional collaboration: inclusion, access, and equity; complexity; and the care and service setting. The ICU team embodies and exemplifies principles rooted in its members' diverse perspectives, talents, beliefs, and experiences to improve teamwork for relationship-centred care (CIHC, 2024:1). Moreover, the ICU staff must exhibit culturally sensitive care considering the team's and patients' cultural variety (Shopo et al., 2023:330). Exhibiting cultural diversity in the ICU environment is essential, particularly amidst heightened emotions, urgency, and panic at critical decision-making moments. Fostering trustworthy relationships among ICU teams will ultimately enable them to understand one another and enhance their appreciation for cultural diversity and culturally sensitive treatment (Brooks, 2020:1).

The second aspect identified as complexity pertains to recognising that the methodology for team-based cooperation may differ when a team member operates in distinct disciplines, varying along a continuum from simple to complicated (CIHC, 2024:1). In a specialised environment like the ICU, the complexity is heightened because of the collaborative care numerous healthcare experts provide. The third factor is the care or service environment. The Framework for Advancing Collaboration (CIHC, 2024:1) defines the care/service setting as the context in which healthcare professionals operate, encompassing the home environment, work and leisure conditions, and accessible support. Such settings profoundly affect collaboration for effective treatment and services (CIHC, 2024:1).

The CIHC Framework for Advancing Collaboration (CIHC, 2024:1) offers a robust theoretical basis for improving interprofessional competency development to facilitate effective collaboration; however, Vaseghi et al. (2022:496) and Leal Silva et al. (2023:1) contend that the majority of medical, nursing and health-allied curricula inadequately address and cultivate interprofessional competencies. Zenani et al. (2023:315) agree on including interprofessional competencies in health education curricula to educate healthcare professionals on collaborative learning and interaction.

A curriculum comprises at least four essential components: material, pedagogical tactics, assessment systems, and evaluation processes. The systematic arrangement of these four elements into a coherent framework is called curriculum design (Grant, 2018:71). The curriculum design in healthcare education is developed for the students and the advantage of healthcare communities. The curriculum's content and student experiences must enhance clinical practice and elevate health education standards (Grant, 2018:71). The authors assert that the curriculum design for CPD programmes in the ICU should be based on the needs of ICU teams, identified knowledge and practice gaps, research, and feedback from patients receiving care from these teams. The curriculum should be pertinent and targeted to address these shortcomings. Consequently, the initial strategy for curriculum design is to ensure that the characteristics of the ICU team are integrated into the curriculum for CPD programmes that increase interprofessional competencies. The ICU team's competencies,

attributes, and scope of practice are emphasised in the material and the educational process (Grant, 2018:71; Tun, 2019:1168). The second strategy is to guarantee that the learning process yields integrated experiences that modify the ICU team's behaviour regarding interprofessional collaboration practices in the ICU. The third method is to promote the ICU to deliver safe and high-quality care as an outcome of the CPD programme (Grant, 2018:71; Tun, 2019:1168).

Competency-based education (CBE) remains pertinent and favoured for CPD programmes in professional healthcare education when compared to traditional approaches (Ige et al., 2024:685). The literature delineates fundamental concepts that distinguish CBE as follows. CBE emphasises the results of training and education, assessing students' competencies relative to established standards. Moreover, CBE necessitates a flexible curriculum that fosters a learner-centred approach (Grant, 2018:71; Ige et al., 2024:685; Tun, 2019:1168). Despite the above debate, limited research examines the nature of interprofessional continuing professional development programmes that strengthen the interprofessional abilities of ICU teams. This study addresses the research question: "What does the literature reveal about the nature of interprofessional continuous professional development programmes designed to enhance the interprofessional competencies of ICU teams?"

The study is approved by the North-West University Health Research Ethics Committee (HREC) and assigned the number (NWU-0051-23-S1).

3 Methods

The authors employed the integrative literature review methodology outlined by Whittemore and Knafl (2005:546) to guarantee a methodologically rigorous integrative literature review. An integrative literature review is valuable for examining the scope and depth of studies published on a certain research issue. Moreover, integrative literature reviews facilitate the exploration of the background and concepts pertinent to a study (Christmals et al., 2018:2377960818783820). This review facilitated the synthesis of previous empirical data to enhance the

knowledge of continuous professional development programmes designed to cultivate interprofessional capabilities within critical care teams (Whittemore & Knafl, 2005:546). An integrative literature review, as defined by Whittemore and Knafl (2005:546), encompasses five stages: problem identification, literature search, data evaluation, data analysis, and presentation of findings. The authors adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for reporting their findings (Moher et al., 2010:336).

The researchers' enquiry for this integrative literature analysis was, "What literature exists regarding continuous professional development programmes designed to enhance the interprofessional competencies of ICU teams?" The research question was formulated using the PICO format (Schardt et al., 2007:1), but the comparator was excluded from this study; therefore, the PIO format was utilised as follows:

- Population (P): ICU teams comprising nurses, medical professionals, and allied healthcare practitioners collaborating within an ICU.
- Intervention (I): Interprofessional continuous professional development programmes.
- Outcome (O): Enhanced interprofessional abilities that facilitated collaboration among professionals.

3.1 Identification of the problem

The absence of interprofessional competencies within ICU teams results in medical errors, fosters professional tensions, and exacerbates conflicts and communication deficiencies, thereby jeopardising the psychological climate for ICU personnel and the safety of critically ill patients (Vincent et al., 2020:1450). This implication in clinical practice is evidenced by increased adverse events that elevate the likelihood of lawsuits (Hlongwa & Rispel, 2021:1; Ngoben, 2022:1; Zenani et al., 2023:2). To address the limitations of skills, knowledge, and traits in suboptimal interprofessional collaboration in the ICU, the authors aimed to explore and describe the available literature

on CPD programmes aimed at enhancing the interprofessional competencies of ICU teams. The results will inform guidelines for developing CPD programmes to enhance interprofessional competencies within ICU teams.

3.2 Literature search

The authors, aided by a research assistant from the institution, searched four research databases: Cochrane Library, ScienceDirect, CINAHL, and PubMed. The literature search encompassed mixed-method, qualitative, and quantitative research studies as part of the inclusion criteria. Additionally, it encompassed reports and grey literature, including dissertations, to thoroughly comprehend the subject under investigation. The PIO structure was an inclusion criterion to decompose the problem into searchable components. Moreover, only full-text publications in English were considered, as all authors are proficient in English, facilitating thorough analysis and comprehensive synthesis of English manuscripts compared to those in other languages.

Furthermore, English is a global academic language, providing access to many works for review. The review encompassed published materials from 2010 to 2023. The initial research on interprofessional abilities and implementation suggestions as essential competencies for Interprofessional Collaborative Practice was released in 2011, justifying the search's commencement in 2010 (CIHC, 2024:1). The exclusion criteria encompassed papers that failed to match the specified standards, non-peer-reviewed sources, and those identified as duplicates during the screening process within the databases utilised for the search. Search descriptors included: Continuing professional development, continuing education, continuing education, staff education, health education development, programmes, training, education, intensive care teams, intensive care unit, emergency unit, critical care team, critical care unit, interprofessional, inter-profession, interprofessional connections, interprofessional competencies, interprofessional education, interprofessional collaboration, multidisciplinary, cross-disciplinary, and transdisciplinary. The Boolean operators employed to amalgamate the different descriptors were "AND"

and "OR". The preliminary search yielded 1,066 sources. The authors identified seven reviews and 250 trials in the Cochrane Library. ScienceDirect provided 435 publications, while PubMed offered 339 publications. Figure 7.2 illustrates the search approach employed by the authors utilising the PRISMA flowchart model.

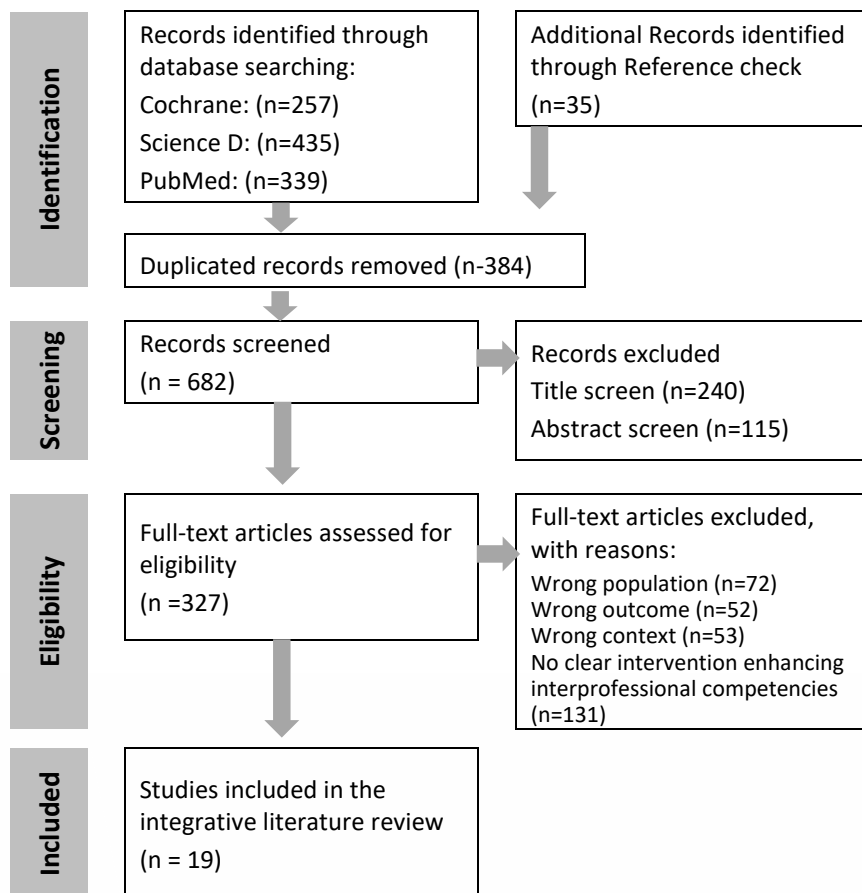


Figure 7.2: Presentation of the search strategy using the PRISMA flowchart model. Source: Adopted from the PRISMA 2009 diagram (Moher et al., 2010:336)

3.3 Data evaluation

The initial search retrieved 1,031 published articles. Author 1 uploaded the articles to the Rayyan data extraction software and thereafter checked the references of the articles to identify additional and relevant articles. Author 1 identified an additional 35 articles. The Rayyan software detected and removed 384 duplicates. Authors 1 and 2 screened the titles of the articles and removed articles deemed irrelevant ($n = 240$). Authors 1 and 2 independently reviewed the abstracts using the pre-determined inclusion and exclusion criteria and removed an additional 115 articles. Authors 1 and 2 then screened the text of the remaining 327 articles for eligibility against the inclusion criteria. Using the Johns Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal Tool (Newhouse et al., 2017:22), the authors critically appraised the identified articles that met the inclusion criteria. Mixed-method studies were appraised using the Mixed Methods Appraisal Tool (MMAT) by Hong et al. (2018:285), as the Johns Hopkins Nursing Evidence-Based Practice Research Evidence appraisal tool could not be used for this purpose. After the screening and quality appraisal, 19 articles were deemed relevant for the integrative literature review.

3.4 Data analysis

Author 1 imported the selected articles into ATLAS.ti 24 and, in collaboration with an independent co-coder and Author 3, conducted a thematic analysis of the data. Following the methodology of Whitemore and Knafl (2005:546), Author 1 and the co-coder separately reviewed the data to become acquainted with its content and to deduce relevant codes. During a meeting, the coders discussed the proposed codebook, whereafter Author 1 and the co-coder coded one of the data sets. Codes were added inductively to the planned codebook when needed. After coding the initial data set, the coders convened to deliberate on the coding to achieve consensus and then finalise the codebook. Upon finalisation of the codebook, the coder and co-coder assigned relevant text from the remaining 19 articles to the appropriate codes. The second and third authors validated the coding procedure for consistency during the coding phase. The authors convened after the completion of coding to deliberate

on the findings and establish links. The authors utilised the relationship and networking features in ATLAS.ti 24 to connect codes to code groups, code groups to sub-themes, and sub-themes to themes. After that, Author 1 compiled a data extraction table comprising the author/s with year and country, research method, characteristics of CPD programmes, assessment, competencies obtained, and impact of CPD programmes on ICU teams and ICU settings.

4 Findings

To address the objective of this review, namely, to explore the nature of the CPD programmes aimed at enhancing the interprofessional competencies of ICU teams, Table 7.1 summarised the findings obtained from the data analysis (Annexure A).

Table 7.1: Summary of the findings

Category	Details
Origin of articles	The included studies originated from diverse geographical locations, reflecting a global interest in interprofessional training for ICU teams. Articles were from the United States of America (n = 5), Canada (n = 3), Germany (n = 3), Spain (n=1), Denmark (n = 1), the United Kingdom (n = 1), Colombia (n=1), Central Iran (n = 1), Thailand (n = 1), Indonesia (n = 1), and Australia (n = 1).
Study design	The studies employed a variety of research designs and methodologies to examine interprofessional training interventions. These included systematic reviews (n = 3), an ethnographic study (n = 1), a cross-sectional study (n = 1), and mixed-method studies (n = 14).
Focus	- The CPD programmes were developed based on the specific needs of ICU professionals and gaps in practice. - The CPDs were grounded in interprofessional education principles, emphasising learning with, from, and about each other. - The CPDs primarily focused on improving teamwork and clinical outcomes in an ICU setting and focusing on interprofessional team-based simulation training.

	• In addition, the CPDs focused on enhancing interprofessional competencies such as communication, collaboration, relational coordination, decision-making, and patient safety among ICU professionals in ICU teams. • Many CPDs emphasised technical skills development, such as advanced interprofessional life support, cardiovascular and respiratory treatment, interprofessional ventilation courses, and palliative care.	
Themes	Description	Sub-themes
Theme 1: Planning	Theme 1 focuses on planning CPD programmes, considering contextual factors, logistics, and participant demographics to ensure relevance and effectiveness.	Situation analysis • training needs analysis • target group (participants) Logistics • recruitment and marketing • venue selection Contextual factors, challenges, and barriers to effective CPD implementation
Theme 2: CPD aims, objectives/ outcomes	Theme 2 focuses on the aim/purpose/outcomes of the CPD programmes in terms of knowledge, skills and attitudes. In addition, it focuses on the benefits of the CPD programme for the ICU teams, patients, and healthcare institutions.	Aim of the CPD in terms of • Knowledge • Skills • Attitudes Benefits of participating in the CPD for • ICU teams • patients • healthcare institutions
Theme 3: Design, delivery and evaluation of the CPD	Theme 3 addresses how CPD programmes are designed and delivered. The theme focuses on curriculum design, teaching and learning strategies, learning activities in which professionals learn with, from and about each other, and content to enhance the interprofessional competencies of ICU teams.	Curriculum development • models and frameworks • course developers Delivery • mode of delivery • CPD duration • facilitators Teaching and learning strategies Learning activities

		Technology used Evaluation of the CPD offering
Theme 4: Assessment and feedback	Theme 4 explores participant assessment practices and feedback practices within the CPD programme.	Assessment practices Feedback

5 Discussion

5.1 Theme 1: Planning

Theme 1 emphasises the planning of CPD programmes, addressing contextual factors, logistics, and participant demographics to ensure relevance and effectiveness. The theme focuses on the importance of conducting a situation analysis, considering the logistics and contextual factors, challenges, and barriers to effective CPD implementation that promote interprofessional abilities that are essential for promoting collaboration within ICU teams; therefore, the development of the CPD course must be meticulously organised. These programmes are structured to dismantle conventional barriers in critical care, fostering collaboration and communication skills vital for providing superior patient care (Reeves et al., 2016:656). The authors subsequently examine the selected sub-themes.

5.1.1 Sub-theme 1.1: Situational analysis

Training needs analysis

From the analysis, performing a situation analysis, which includes a training needs analysis and pre-assessment evaluations to identify the knowledge and/or skills deficiencies among ICU workers that require rectification, is essential. Needs analysis are done using questionnaires containing close-ended Likert scale and/or open-ended type of questions. Questions centred around course expectations, course structure, content, and logistics. Course participants' feedback is considered pivotal in developing the course content and structure, thereby improving participant engagement (Bernal et al., 2023:765; Brewster et al., 2017:79; Flentje et al., 2020:1; Graham et

al., 2018:75; Irajpour et al., 2019:196; Lown et al., 2011:401; Manggala et al., 2022:617; Michael et al., 2022:939187; Nicholson et al., 2019:100284; Nonas et al., 2022:270; O'Brien et al., 2023:85; Weile et al., 2021:1). Holloway et al. (2018) assert that CPD programmes must be pertinent, intentional, and inclusive of diverse personal and professional development needs. Assessing training needs is crucial for ensuring that CPD programmes enhance the performance growth of ICU professionals effectively. Moreover, conducting a training needs analysis provides an understanding of the unknown factors in the workplace, such as policy and management structure, which may cause the skills or knowledge gap. This information could save superfluous expenditures on unsuitable education and direct efforts towards assisting ICU teams and the organisation in achieving their objectives or addressing training requirements (Holloway et al., 2018:7).

Intended Audience/Participants in the Continuing Professional Development

The analysis indicated that the intended audience for the CPD programme comprised interprofessional healthcare teams (Bernal et al., 2023:765; Fettig et al., 2022:1157; Irajpour et al., 2019:196; Lincoln et al., 2020:e033521; Lown et al., 2011:401; Manggala et al., 2022:617; Michael et al., 2022:939187; Watts et al., 2014:521). The presence of the interprofessional team in the ICU participating in CPD programmes facilitated mutual learning and enhanced interprofessional collaboration, improving the quality and safety of critical care. McLaney et al. (2022:112) characterise interprofessional teams as diverse experts and healthcare practitioners who possess a collective identity and collaborate in a cohesive and interdependent manner to address intricate care challenges and deliver health services. The findings concur with Australian research, suggesting that interprofessional CPD programmes should include multiple professions to encourage team-based learning (Main & Anderson, 2023:23). In the United States of America (USA), the interprofessional nature of participants in the CPD programmes enables joint accreditation for CPD programmes. It provides simultaneous accreditation across health practitioner groups.

5.1.2 *Sub-theme 1.2: Logistics*

Logistics are essential in the planning of CPD programmes that improve the interprofessional competencies of ICU teams, encompassing elements such as marketing and recruitment, venue selection, contextual factors, and obstacles to implementing ICU CPD programmes that enhance these competencies. These elements collectively aid facilitators in minimising disruptions, enhancing participant engagement, and attaining the learning objectives of the CPD efforts (Michael et al., 2022:939187; Bernal et al., 2023:765; House et al., 2023:102001).

Recruitment and Marketing

The review emphasises the importance of efficient scheduling and promotion of CPD programmes for ICU teams as a crucial strategy for obtaining management support and attaining successful results (Abu-Rish Blakeney et al., 2019:481; Fettig et al., 2022:1157; George & Quatrara, 2018:144; House et al., 2023:102001; Lown et al., 2011:401). For example, in Canada, George and Quatrara (2018:144) pre-emptively engaged with executive management three months before the trial, disseminating course content and coordinating meetings with ICU teams to address enquiries and concerns. Fettig et al. (2022:1157) in the USA utilised targeted emails and promotional materials to enlist people for their communication skills training designed to enhance team relationships in the ICU. Do et al. (2022:808) highlighted that utilising authority figures could enhance the requisite support for course implementation. Management endorsement links training with operational requirements and cultivates a learning culture, encouraging staff participation in training efforts. House et al. (2023:102001) executed a two-month recruiting and marketing initiative for their training programme in Germany, including emails, virtual meetings, and in-person engagements with the ICU team to delineate objectives, content, expectations, and assessment methodologies. Abu-Rish Blakeney et al. (2019:481) improved marketing initiatives by issuing weekly reminders and occasional announcements during staff meetings, rewarding confirmed participants with coffee vouchers and entries into a prize draw, thus cultivating innovative relationships with management and staff to

guarantee complete attendance. Hill et al. (2021:1228) assert that recruitment and marketing campaigns enhance participation rates, and institutions that actively promote training opportunities experience increased workforce engagement, ultimately resulting in improved patient outcomes due to augmented clinical knowledge and skills, particularly in the ICU environment.

Selection of venue

The selection of locations for interprofessional training programmes is essential for the efficacy of programme facilitation. The review reveals that training facilities comprised simulation laboratories, ICU environments, and lecture halls within affiliated universities and hospitals, furnished with sophisticated mannequins for authentic patient–staff interactions (Bernal et al., 2023:765; Brewster et al., 2017:79; Fetting et al., 2022:1157; Flentje et al., 2020:1; Graham et al., 2018:75; Irajpour et al., 2019:196; Lincoln et al., 2020:e033521; Manggala et al., 2022:617; Michael et al., 2022:939187; Nonas et al., 2022:270; Weile et al., 2021:1). The simulation laboratories accurately mimicked actual ICU settings, enabling participants to hone their abilities in a realistic situation, thus improving the integration of theory and practice (Nonas et al., 2022:270; Watts et al., 2014:521). Literature indicates that when healthcare students promptly use theoretical information in simulated laboratories, they get deeper insights and retain knowledge and abilities efficiently. Furthermore, swift theory practice integration in simulation laboratories fosters reflective learning, allowing healthcare students to critically analyse their actions and outcomes, which leads to CPD (Fadana & Vember, 2021:1; Nxumalo, 2011:1; Weeks et al., 2019:29).

Several studies included in-situ simulation, wherein training interventions occurred within hospital environments, including ICUs, emergency departments, and simulation laboratories, enhancing skill display and retention (House et al., 2023:102001; Watts et al., 2014:521). The course facilitators employed specialised teaching rooms furnished with audiovisual equipment for instructional sessions before practical training in simulation areas, as noted by Nonas et al. (2022:270), Nicholson et al. (2019:100284), Watts et al. (2014:521), Manggala et al. (2022:617), and Fetting et al.

(2022:1157). These hospitals, designated as teaching institutions, upheld service-level agreements with universities, enabling the incorporation of academic resources into the training programmes. Nonas et al. (2022:270) executed a mixed-method study in Thailand, incorporating commercial and state hospitals and university simulation centres for training objectives. The partnership between universities and hospitals is essential for supplying requisite resources and ensuring participant involvement, improving the skill development of ICU teams and eventually fostering safe, high-quality patient care (Nxumalo, 2011:1).

5.1.3 Sub-theme 1.3: Contextual considerations, challenges and barriers to effective CPD implementation

According to the Oxford Dictionary, contextual factors denote the diverse aspects or conditions that may affect, shape, or characterise a specific scenario. As part of the contextual factors, the review emphasised the need for the CPD programmes to be tailored to the specific needs of participants, infrastructure, and resources while being culturally sensitive and inclusive (Lown et al., 2011:401; Watts et al., 2014:521; Nonas et al., 2022:270). For instance, Nonas et al. (2022:270) highlighted the importance of having translators to accommodate varying English proficiency levels among ICU teams, ensuring effective communication and understanding. The review also underscored the significance of selecting appropriate interprofessional faculty committed to the programme's objectives and the necessity of leadership support for ICU teams to attend training (Lown et al., 2011:401). The presence of cross-cultural champions could motivate diverse professionals to engage with CPD programmes, enhancing their effectiveness.

The review indicated that developing and facilitating CPD programmes to enhance interprofessional competencies among ICU teams presents unique challenges that require careful strategic planning. High-fidelity simulators were utilised to create realistic ICU scenarios; however, Brewster et al. (2017:79) noted that the effectiveness of interventions could be compromised if only lower-fidelity equipment were used. Similarly, Chang, Chen et al. (2025:104424) reported limitations in equipment, such as using

plastic bags as simulated lungs, which restricted scenario complexity and educational effectiveness. Effective planning and resource collaboration with stakeholders, as demonstrated by Nonas et al. (2022:270), are essential for creating conducive learning environments. Cost implications were also a common concern, with George and Quatrara (2018:144) estimating simulation training costs at \$326 per session. Nationally and globally, interprofessional CPD programmes present similar common barriers, including lack of resources, lack of time, and cost implication (Chetty et al., 2020:1; Mulder, 2019:1; Santos et al., 2018:1601). Addressing these challenges before implementing interprofessional ICU CPD programmes is crucial.

5.2 Theme 2: Aims, objectives/outcomes of the CPD

Attaining competencies after CPD programmes is of benefit both to the individual and to the organisation's success. Competencies in this context encompass knowledge, skills, and attitude which are essential for ensuring that the ICU teams can demonstrate their roles and adapt to the ever-evolving demands in the ICU effectively. Through acquiring competencies, the ICU teams are equipped to manage complex challenges. In the review, the learning objectives that led to developing the achieved competencies were structured. They were specific, measurable, realistic, and relevant to the included training activities.

5.2.1 Sub-theme 2.1: Aim/objectives/outcomes of the CPD

Knowledge

The CPD course's content focused on technical and non-technical ICU-related skills, enhancing interprofessional competencies among the teams. Topics included advanced critical illness support, interprofessional approaches to patient transport, support for surrogate decision-makers, mechanical ventilation, relational coordination, communication skills training, and medication safety programmes (Brewster et al., 2017:79; Fetting et al., 2022:1157; House et al., 2023:102001; Lincoln et al., 2020:e033521; Mangala et al., 2022:617; Michael et al., 2022:939187; Nonas et al.,

2022:270; Watts et al., 2014:521). The common theme across these topics was their relevance to patient care and the collaborative scope of practice for ICU teams. The content emphasised the need for effective communication and teamwork to ensure safe and quality care. Van Diggele et al. (2020:455) recommend that the content of interprofessional education (IPE) programmes should focus on patient needs to break down hierarchical barriers and enhance collaborative care.

Skills

The most evident skills that were developed across the articles included collaborative leadership, interprofessional communication, clarification of roles and responsibilities, problem-solving, critical thinking, decision-making and dynamic prioritisation (Abu-Rish Blakeney et al., 2019:481; Bernal et al., 2023:765; Brewster et al., 2017:79; George & Quatrara, 2018:144; Fetting et al., 2022:1157; Flentje et al., 2020:1; Graham et al., 2018:75; House et al., 2023:102001; Lincoln et al., 2020:e033521; Lown et al., 2011:401; Manggala et al., 2022:617; Michael et al., 2022:939187; Nicholson et al., 2019:100284; Nonas et al., 2022:270; Watts et al., 2014:521; Weile et al., 2021:1). Nonas et al. (2022:270) outlined specific skills for each phase of their programme. Similarly, Watts et al. (2014:521) integrated competencies into simulation training, which included enhanced critical thinking, clinical reasoning, and team-based communication. The art of embedding the skills in the training programmes ensured that the focus shifted from merely acquiring theoretical knowledge to developing practical skills and behaviours that could be applied in real-world situations. This approach helps the ICU teams, not only to understand concepts but also to demonstrate proficiency in the specific tasks required by their roles. According to Mulder (2019:1), integrating skills development into training enhances the alignment between learning objectives and job requirements, making the training more effective and purpose driven.

Attitudes

The interprofessional CPD programmes in the review fostered a culture of values and ethics, trust and respect among the ICU healthcare professionals

(Lown et al., 2011:401; Michael et al., 2022:939187; Nicholson et al., 2019:100284; Nonas et al., 2022:270; Watts et al., 2014:521). The developed attitudes promote effective interprofessional collaboration and communication among the ICU teams, which encourages the development of other essential attitudes, such as empathy and a patient-centred approach. The findings are supported by Van Diggele et al. (2020:455), who discuss that interprofessional CPD programmes increase empathy, team efficacy, and collaboration among ICU teams.

5.2.2 Sub-theme 2.2: Benefits of participating in the CPD

The review highlighted the three-dimensional advantages of interprofessional CPD programmes for ICU teams, patient safety, and organisational outcomes. These programmes enhance the quality of care, improve ICU teams' perceptions of safety, and foster a culture of patient safety by implementing structured systems that prevent adverse events.

ICU teams

The review revealed that for ICU teams, the CPD programmes have assisted in improving team dynamics by clarifying roles and responsibilities and addressing cross-cultural differences for better interprofessional collaboration. Moreover, the CPD programmes strengthened team trust and respect, ultimately aiding in team coordination, improving the psychological safety environment of the ICU, and facilitating shared decision-making. Literature supports the findings and indicates that interprofessional CPD for ICU teams increases team cohesion and enable conflict resolution among the team and allows a more supportive working environment (Hill et al., 2021:1228; Mulder, 2019:1).

Patients

As a benefit for patients, the review discovered that the CPD programmes aimed at enhancing the interprofessional competencies of ICU teams reduce adverse events and promote patient-centred care. For example, Nonas et al. (2022:270) reported improved management of respiratory conditions, while Flentje et al. (2020:1) and George and Quatrara (2018:144)

noted decreased adverse events and improved resuscitation times following their respective interprofessional training interventions. Additionally, Gómez-Pérez et al. (2023:263) emphasised the role of the programme in recognising and mitigating medication errors. Xyrichis and Rose (2024:103536) support the findings and state that interprofessional CPD programmes in ICU support quality healthcare where mortality and morbidity rates are decreased due to high team interaction and coordination. Moreover, the CPD programmes decrease inappropriate care, healthcare-associated infections, and extended patient stays and duration of mechanical ventilation.

Healthcare institutions

Greater returns were noted for the healthcare establishments facilitating interprofessional CPD programmes for their ICU teams. Job satisfaction and retention among ICU staff were identified, with George and Quatrara (2018:144) estimating a significant reduction in ICU team turnover costs post-intervention. House et al. (2023:102001) found high ratings on the intent-to-stay scale among ICU teams, indicating improved morale and collaboration for positive patient outcomes. Lastly, the review showed that interprofessional interventions positively impact organisational outcomes by decreasing patient readmission rates and lengths of stay, ultimately enhancing patient satisfaction scores (Abu-Rish Blakeney et al., 2019:481; Bernal et al., 2023:765; Chang et al., 2025:1; Fettig et al., 2022:1157; George & Quatrara, 2018:144; Nonas et al., 2022:270). The inclusion of structured interdisciplinary bedside rounds further strengthened relationships between ICU teams and patients, ensuring that patient opinions were integral to care decisions (Abu-Rish Blakeney et al., 2019:481; Bernal et al., 2023:765; Fettig et al., 2022:1157; George & Quatrara, 2018:144). Therefore, the interprofessional CPD programmes in the ICU are of great benefit; they enhance patient safety significantly, foster a culture of collaboration, and equip the ICU teams with innovative skills on how to provide team-based care to address the complex needs of the patients (Xyrichis & Rose, 2024:103536).

5.3 Theme 3: Design, delivery and evaluation of the CPD

5.3.1 Sub-theme 3.1: Curriculum development

Curriculum models and frameworks

The curriculum model is a foundational framework for developing, implementing, and evaluating CPD programmes, particularly for ICU teams. An effective curriculum model enhances the relevance and coherence of training, addressing the specific needs of these teams (Enser & Enser, 2021:1). The review identified seven models, including the Interprofessional Learning Continuum (ILC), the Vital Talk Model, the Interprofessional Education (IPE) curriculum, the Simulation-Enhanced curriculum, the Kern Six-Step Model, and the Kirkpatrick Model. The ILC, utilised by Abu-Rish Blakeney et al. (2019:481) in Colombia, facilitated interprofessional collaboration among advanced heart failure teams, leading to improved teamwork. Similarly, Brewster et al. (2017:79) reported positive team performance in an advanced life support training programme in Australia that incorporated the ILC. This model serves as both a conceptual framework for programme development and a tool for evaluating interprofessional education and health outcomes, adaptable to various cultural and policy contexts (Costanzo et al., 2010:1). The Vital Talk Model, employed by Bernal et al. (2023:765) and Fetting et al. (2022:1157), focuses on goal-of-care conversations among healthcare professionals and patients, which are crucial for ensuring informed decision-making and ethical care in the ICU. The absence of such discussions could lead to decisional conflicts and psychological distress, highlighting the importance of equipping ICU teams with the skills to engage in these critical conversations. Nicholson et al. (2019:100284) adopted the IPE curriculum in a mixed-method study, promoting values and ethics for interprofessional collaboration among nurses and residents in a paediatric acute care setting. The IPE curriculum fosters a safety culture and enables healthcare professionals to learn collaboratively, ultimately improving healthcare outcomes. It incorporates social and educational theories that support interprofessional learning, which is essential for the post-licensure training programme (Mohammed et al., 2021:S16). The Simulation Enhanced curriculum is favoured for CPD

programmes to enhance interprofessional competencies among ICU teams. Simulation training allows interprofessional teams to practise skills in a controlled environment, facilitating the development of complex cognitive skills such as critical thinking, decision-making and teamwork in managing intricate clinical scenarios (Abu-Rish Blakeney et al., 2019:481; Brewster et al., 2017:79; George & Quatrara, 2018:144; Michael et al., 2022:939187; Nonas et al., 2022:270; O'Brien et al., 2023:85; Watts et al., 2014:521).

The Kern Six-Step Model was applied in Germany for developing an interprofessional advanced critical illness life support course, demonstrating structured course development and high efficiency (Flentje et al., 2020:1; Michael et al., 2022:939187). The Kern Six-Step Model addresses ICU teams' specific challenges while considering their unique needs and organisational context, promoting effective training interventions. Khamis et al. (2016:279) discuss that the six-step model, as proposed by Kern's, represents a widely used systematic approach to curriculum development that complies with the requirements of healthcare accrediting bodies and links curricula to healthcare needs. The six steps include problem identification, general needs assessment, target needs assessment, goals and objectives, educational strategies, implementation, evaluation, and feedback. For CPD programmes, Govindarajan and Rajaragupathy (2024:1223) discuss that Kern's six-step model is a curriculum model of choice, as it could ensure that the CPD programme addresses the identified gaps in knowledge or skills effectively.

Lastly, as reviewed by Weile et al. (2021:1) in Denmark, the Kirkpatrick Model was utilised to evaluate interprofessional simulation-based training outcomes in emergency and critical care settings. Literature reveals that the Kirkpatrick Model is highly effective in assessing CPD programmes because it provides a multifaceted framework to evaluate the immediate and long-term impact of the training, not only on participants, but also on the organisations (Allen et al., 2019:1087; Bhatia et al., 2021:27; Rehman & Ganaie, 2024:456; Walker et al., 2019:210). The Kirkpatrick Model evaluates the participants' reactions, learning behaviours, and programme results. There are four levels: the first examines the participants' satisfaction to gauge if the participants are engaged in the content. The second level

measures acquiring knowledge and skills, which is fundamental for professional development. The third level evaluates the behaviours, assessing how participants can apply what they have learned in their respective roles to ensure that the CPD leads to evidence-based practice and improvements in practice. Finally, the last level examines the impact on the organisation, such as improved performance, patient satisfaction index, or patient safety (Kirkpatrick & Kirkpatrick, 2006:1).

Course developers

The interprofessional CPD programmes for ICU teams were designed by a variety of healthcare professionals from diverse specialities, who brought a wealth of expertise together to enhance the interprofessional competencies of the ICU teams (Abu-Rish Blakeney et al., 2019:481; Bernal et al., 2023:765; Fettig et al., 2022:1157; Flentje et al., 2020:1; House et al., 2023:102001; Michael et al., 2022:939187; O'Brien et al., 2023:85; Weile et al., 2021:1). The collaborative efforts of the interprofessional course developers ensured that the curriculum reflected of the real ICU challenges, was comprehensive, and integrated the unique perspectives to create a multifaceted learning environment. Literature reveals that the involvement of valued experts in the curriculum design of interprofessional CPD programmes is pivotal in fostering a unified approach that promotes the improvement of teamwork and a deeper appreciation for the diverse skills each healthcare professional brings for the benefit of healthcare professionals and patients alike (Delawala et al., 2022:1; Goldman et al., 2018:407; Verd-Aulí et al., 2021:3).

5.3.2 Sub-theme 3.2: Delivery

Mode of delivery

The review also highlighted the adoption of various modes of delivery, including online learning as a prerequisite for contact classes, formal lectures facilitated by interdisciplinary teams, face-to-face workshops, interprofessional discussions, group work activities, role-plays, peer-review of protocols or ICU guidelines, team-building exercises, and simulation

training using high- and low-fidelity methods (Abu-Rish Blakeney et al., 2019:481; Bernal et al., 2023:765; Brewster et al., 2017:79; Fetting et al., 2022:1157; Gómez-Pérez et al., 2023:263; Michael et al., 2022:939187; Nonas et al., 2022:270). The variety of modes of delivery adopted by the programmes promoted active learning in which the participants engaged with the course content. Additionally, they accommodated the diversity of the learning styles exhibited by the interprofessional team; this reinforced collaboration and supported the different stages that each profession is at in terms of professional development.

A blended learning approach was predominantly noted, which is recognised as effective and efficient for the training of healthcare professionals, cost-effectively combining face-to-face and online learning (Abbacan-Tuguic, 2021:443; Abuhassna et al., 2022:66; Namyssova et al., 2019:22; O'Connor et al., 2011:63). Blended learning allows students to achieve better outcomes than traditional methods, fostering independence and autonomy in their learning, which is particularly beneficial for ICU teams with demanding schedules (Abuhassna et al., 2022:66). An interprofessional course on advanced critical illness support in Germany included pre-e-learning modules before face-to-face lectures, resulting in positive interprofessional discussions and participant engagement. Similarly, a Canadian interprofessional advanced life support programme incorporated pre-course e-learning and case-based scenarios, promoting knowledge acquisition and retention while facilitating interprofessional discussions (Michael et al., 2022:939187). Leidl et al. (2020:104318) support using blended learning in CPD programmes for healthcare professionals, emphasising its ability to address geographical challenges and provide flexible learning options for those with demanding workloads. This approach enhances diversity in the student population and fosters interaction, reflection, and robust discussions, which are critical for deep learning in adult learners.

CPD duration

The first logistics component identified was the duration of the programmes. Most of the CPD programmes in the review were short-term.

According to a systematic review by George and Quatrara (2018:144), interprofessional CPD programmes can range from 30 minutes to several days, like findings by Weile et al. (2021:1), which noted programme durations from 15 minutes to four weeks. There are doubts about whether deep learning can be achieved in just 15 minutes, and the article does not confirm this further. Moreover, other articles have shown that the duration typically lasts a few hours to a couple of weeks, such as Brewster et al. (2017:79), which was facilitated for four hours, and Michael et al. (2022:939187) for four weeks and two days. The rest of the CPD programmes varied in duration from 12 hours to a maximum of eight days (Bernal et al., 2023:765; Fettig et al., 2022:1157; Flentje et al., 2020:1; Irajpour et al., 2019:196; Manggala et al., 2022:617; Michael et al., 2022:939187; Nonas et al., 2022:270; Weile et al., 2021:1). Nine of the studies did not indicate the specific timeframe of the training intervention (Abu-Rish Blakeney et al., 2019:481; Gómez-Pérez et al., 2023:263; Graham et al., 2018:75; House et al., 2023:102001; Lincoln et al., 2020:e033521; Lown et al., 2011:401; Nicholson et al., 2019:100284; O'Brien et al., 2023:59; Watts et al., 2014:521). Eisenberg et al. (2013:603) assert that clearly defined programme durations are essential for allowing participants adequate time to internalise and practise new knowledge and skills. Eisenberg et al. (2013:603) further note that overly brief courses may lead to superficial understanding, while excessively lengthy programmes could cause fatigue and reduce participant engagement. Therefore, it is crucial to gather feedback from participants regarding their preferred course duration to tailor training to their needs and expectations, thereby enhancing their commitment to the programme (Bernal et al., 2023:765; Brewster et al., 2017:79; Flentje et al., 2020:1; Graham et al., 2018:75; Irajpour et al., 2019:196; Manggala et al., 2022:617; Michael et al., 2022:939187; Nicholson et al., 2019:100284; Nonas et al., 2022:270; Weile et al., 2021:1).

Facilitators

The facilitation of the course involved teams representing various professions, particularly in an interprofessional simulation-enhanced mechanical ventilation course, where two professionals led 50-minute

didactic sessions followed by a 10-minute question-and-answer session (Nonas et al., 2022:270). Before the course, facilitators underwent a five-day "train the trainer" programme to ensure standardisation and enhance learning outcomes, allowing consistent training across different instructors. The interactive nature of the facilitators promoted engagement through various methods, including open-ended questions, peer discussions, interprofessional meetings, and debriefing sessions (Abu-Rish Blakeney et al., 2019:481; Bernal et al., 2023:765; Brewster et al., 2017:79; Fettig et al., 2022:1157; Gómez-Pérez et al., 2023:263; Michael et al., 2022:939187; Nonas et al., 2022:270). Xyrichis and Rose (2024:103536) support using interprofessional facilitators as it fosters collaboration, unique contributions from the various healthcare professionals, role clarification, team critical thinking, and effective communication among ICU teams, which are essential for addressing conflicts and enhancing interprofessional collaborative practices.

5.3.3 Sub-theme 3.3: Teaching and learning strategies

Effective selection of teaching and learning approaches is crucial in the instructional design of training interventions, particularly for ICU teams. The aim is to facilitate the deep processing of information, enabling students to connect new skills and knowledge to their existing experiences (Xu, 2016:54). The review indicated a significant emphasis on a student-centred approach, where instructors act as facilitators, empowering students to take control of their learning through small mixed-discipline group activities. Literature advocates for a student-centred approach as it aligns with essential soft skills required in health services and the knowledge-based economy, including problem-solving, critical thinking, collaboration, innovation, and creativity (Bara & Xhomara, 2020:180; Doyle, 2023:1; Logeswaran et al., 2021:e79; Shehata et al., 2024:7813). Additionally, reflective group discussions with probing questions were employed to enhance problem-solving and clinical reasoning skills alongside small group simulations overseen by facilitators. O'Connor et al. (2023:103635) affirm that students become passive listeners, unlike large group teaching, where much information is transferred quickly. Instead of understanding how to apply the knowledge in practice, they focus on memorising the content.

However, small group activities stimulate problem-solving and effective engagement. The articles did not clarify whether groupings were pre-determined or participant-chosen, which is essential to avoid bias and fulfil the objectives of relationship-building to develop interprofessional competencies.

The review further revealed that the instructor-to-student ratio varied, typically involving two to three students per instructor, ensuring that ICU teams received guidance and immediate feedback to enhance learning. Clinical skills demonstrations by skilled professionals and participant document reviews were also included. Peer learning emerged as a vital component, allowing ICU teams to learn collaboratively and deepen their understanding of the content (Chang et al., 2019:1; Fetting et al., 2022:1157; Flentje et al., 2020:1; Graham et al., 2018:75; House et al., 2023:102001; Irajpour et al., 2019:196; Lincoln et al., 2020:e033521; Manggala et al., 2022:617; Michael et al., 2022:939187; Nicholson et al., 2019:100284; Watts et al., 2014:521). Continuous coaching and feedback from facilitators further ensured comprehension throughout the teaching experience. Similarly, Decker et al. (2021:27) support that feedback from facilitators, especially when simulation-based training is involved, must be structured and incorporate various phases, such as facilitating analysis or critique of the team, system, or students themselves. The facilitators must allow for flexibility based on the different students, identify the programme's objectives, and promote critical thinking and reflection to encourage the students to search for evidence-based solutions.

5.3.4 Sub-theme 3.4: Learning activities

Simulation exercises, role-play, team building, and structured bedside training were among the learning activities that were identified in the review as best to promote interprofessional competencies among the ICU team (Fetting et al., 2022:1157; Flentje et al., 2020:1; Graham et al., 2018:75; House et al., 2023:102001; Irajpour et al., 2019:196; Lincoln et al., 2020:e033521; Manggala et al., 2022:617; Michael et al., 2022:939187; Nicholson et al., 2019:100284; Watts et al., 2014:521). Studies support incorporating various teaching activities for interprofessional CPD

programmes for ICU teams as pivotal in accommodating the diversity of learning styles and promoting engagement among ICU professionals. The varied instructional methods further deepen understanding and competencies retention of the complex material essential in ICU. Furthermore, the facilitators of the course could address the unique needs of the team members from different disciplines, fostering an inclusive learning atmosphere that promotes interprofessional collaborative practices (Fettig et al., 2022:1157; Flentje et al., 2020:1; Graham et al., 2018:75; House et al., 2023:102001; Irajpour et al., 2019:196; Lincoln et al., 2020:e033521; Manggala et al., 2022:617; Michael et al., 2022:939187; Nicholson et al., 2019:100284; Watts et al., 2014:521). Literature supports the findings and states that interactive activities encourage active participation and allow ICU specialists to apply theoretical knowledge to practical situations they encounter in the treatment of patients. Simulation and practical workshops are shown to improve clinical skills and improve teamwork by imitating the real situation in which interprofessional collaboration is essential (Govindarajan & Rajaragupathy, 2024:1223; Low et al., 2018:283; Rehman & Ganaie, 2024:456; Tashkandi, 2021:665).

Another noteworthy observation was incorporating pre-reading or pre-course activities before training attendance. Brewster et al. (2017:79) provided course manuals six weeks in advance, while Manggala et al. (2022:617) included an interactive lecture session the day before simulation training. Michael et al. (2022:939187) distributed manuals four weeks prior, and Weile et al. (2021:1) offered pre-course materials a week before the training. As Malcolm Knowles (1970:1) and Bouchrika (2024:1) articulated, these practices uphold adult learning principles. Participants were informed about the course objectives beforehand, allowing them to take ownership of their learning process and self-evaluation through multiple-choice and open-ended evaluations. The pre-reading materials provided foundational knowledge, facilitating progressive engagement during the course.

5.3.5 Sub-theme 3.5: Technology used

The review encourages the use of e-learning alongside high- and low-simulators in the CPD programmes that enhance the interprofessional

competencies of ICU teams (Fettig et al., 2022:1157; Flentje et al., 2020:1; George & Quatrara, 2018:144; House et al., 2023:102001; Lown et al., 2011:401; Manggala et al., 2022:617; Michael et al., 2022:939187; O'Brien et al., 2023:85). The use of the indicated technological tools has proven to enhance learning outcomes, foster student engagement, knowledge retention, and effective interprofessional collaborative practices in the ICU (Tashkandi, 2021:665).

5.4 Theme 4: Assessment and feedback

5.4.1 Sub-theme 4.1: Assessment tools

Assessment tools are crucial for measuring learning outcomes and the effectiveness of CPD interventions. The review indicates that these tools assess both technical and non-technical skills, including communication, collaboration, and patient safety attitudes (Abu-Rish Blakeney et al., 2019:481; Bernal et al., 2023:765; Brewster et al., 2017:79; Fettig et al., 2022:1157; Michael et al., 2022:939187; Nonas et al., 2022:270). The assessment tools were multidimensional, evaluating multiple competencies such as communication, collaboration, role clarification, and conflict resolution. The multidimensional tools that were identified in the review included the following: Jefferson scale towards physician and nurse collaboration, Team STEPPS team perception questionnaire, Relational Coordination Survey, Teams Survey Tool, and Clinical Teamwork Scales. The listed assessment tools varied in length and included Likert scales and open-ended questions, allowing for individual evaluations (Brewster et al., 2017:79; Chang et al., 2019:1; Fettig et al., 2022:1157; George & Quatrara, 2018:144; Irajpour et al., 2019:196; Manggala et al., 2022:617; Nonas et al., 2022:270). The assessment tools were provided before or after the course commenced, or both. The difference was measured to ascertain skills, knowledge acquisition, and changes in the participants' behaviours, attitudes, and reactions. The assessment tools were direct observations assessed by the course facilitators. They formed part of formative and summative evaluation. Moreover, the practical skills were evaluated with specific tools, and the final assessment was done at the end to consolidate

the learning process. Kirkpatrick and Kirkpatrick (2006:1), who wrote on the evaluation of training programmes, affirm that continuous assessment during and after learning is important and ensures that the learning objectives of the CPD programme are being met. Moreover, through the regular evaluation of knowledge and skills, the facilitators can modify the content and delivery method to address the participants' needs better. Additionally, this adaptability enhances the relevance and effectiveness of the CPD programme.

5.4.2 Sub-theme 4.2: Feedback

Feedback in CPD programmes plays a critical role in evaluating not only the effectiveness of the CPD programme in meeting the curriculum objectives, but the feedback also assists in providing direction for the programme and its continuous improvement (Tashkandi, 2021:665). The review revealed that CPD programmes enhance the interprofessional competencies of ICU teams. Feedback to participants should be structured based on the content and learning outcomes against the students' performance; feedback also needs to be provided in reflective discussions and with peer review. The findings concur with the Westerveld framework for interprofessional feedback for training by Tieleman et al. (2023:472), who narrate that feedback for interprofessional programmes needs to be based on the observed task performance, provided timeously and should be in a dialogical format with clear and unambiguous language. Moreover, the feedback must be sense-making, prioritising what is important and forward-looking for the participants.

Obstacles to integrating interprofessional collaboration into CPD: implications and responsive strategies using the Canadian Interprofessional Competency Framework.

Current CPD programmes intended for healthcare professionals are facilitated in overly specialised learning environments. The overly specialised environment, therefore, limits optimal engagement across the various healthcare disciplines, ultimately reducing opportunities for meaningful interprofessional dialogue around healthcare systems and

patient safety innovations. The study has shown that to combat that phenomenon, CPD programmes aimed at enhancing interprofessional competencies should include patient narratives systematically within the CPD. This ensures that the CPD programmes are centred around improving patient outcomes. Moreover, actively including the patients and a variety of healthcare professionals as co-educators within the CPD programme, will reinforce the voice of the patients and support interprofessional communication competency. Activities such as interprofessional case discussions can be included to promote inclusivity and culturally safe communication. In addition, the CPD programme can adopt structured interprofessional tools such as shared language, use of interpreters, and referral templates to promote interprofessional communication as a skill. Furthermore, the study has revealed that the CPD programme should incorporate interprofessional simulation exercises that focus on collaborative conversations. The interprofessional simulations will, as an outcome, promote role clarity, reinforce mutual respect, shared leadership, and initiate interprofessional identity. In the same activity, issues such as power dynamics roles ambiguity can be highlighted and addressed in teams.

The study further revealed that there is low participation with a limited number of learners in CPD programmes that promote interprofessional competencies, which leads to fewer professionals being exposed to shared learning. The study suggests making the CPD programme accessible through digestible content, with short highlight clips within a learning management system to reach a broader audience. Furthermore, making the CPD short-term, to combat the very low response rate, which leads to the inability of the course facilitators to evaluate if the objectives are reached. To promote role clarification and negotiation, which is part of the CIHC competency framework. The study revealed that the CPD programme can include case discussions as a form of learning strategy, in which each profession articulates its contribution. Exercises such as explicit role mapping can be incorporated, and the healthcare professionals can be encouraged by the facilitators to reflect on the overlapping and fluid roles and measures to prevent such instances. This practice will promote role clarification and reduce duplication or gaps in patient care.

6 Limitations and further recommendations

The review indicated that the findings on the interprofessional CPD programme in the ICU may not be generalisable to other disciplines, suggesting the need for further research across various care levels. Additionally, the review did not address the preferred process flow of training programmes lacking elements such as icebreakers to foster rapport and communication among ICU teams. Considering the changes in healthcare education, the review did not indicate how virtual simulation-based training could be incorporated into the CPD programmes, especially for ICU teams whose work schedules require innovative but effective teaching modalities. Further studies could explore the lack and how virtual Observed Structured Clinical Examinations (OSCEs) could be incorporated, allowing ICU professionals to practise and demonstrate clinical skills in standardised medical scenarios as part of the final assessment in interprofessional CPD programmes. Although the ICU teams were provided with interprofessional education with diverse professionals, the review noted that the assessment tools were designed to measure the individual's changed perception of teamwork, collaboration, patient safety attitude, etc. These competencies were not measured as part of summative assessment in groups with structured feedback afterwards to reinforce interprofessional competencies. Future CPD programmes aimed at enhancing the interprofessional competencies of ICU teams could investigate using tools that measure the teams and not necessarily individuals to align with the learning objectives of IPE.

Moreover, incorporating the Interprofessional Education Collaborative (IPEC) framework into healthcare education curricula before the licensure of ICU professionals could facilitate the gradual development of interprofessional competencies, emphasising shared mental models, communication, and collaborative practices. Regulatory bodies should consider integrating the IPEC framework into healthcare education curricula with clearly defined processes for articulating and measuring interprofessional competencies in curricula for pre-licensure socialisation into interprofessional competencies. Additionally, it encourages faculty/healthcare educators' development to enhance interprofessional

education understanding and how to facilitate and evaluate IPE effectively. Furthermore, the review did not clarify whether different healthcare professional regulatory bodies mutually recognised the CPD programmes. Additionally, the process of CPD accreditation for IPE programmes was poorly defined, indicating a need for further research to investigate these identified gaps. The review recommended using in-situ simulation for the CPD programmes that enhance interprofessional competencies of ICU teams for prompt theory integration. When adopting in-situ simulation, it is recommended to be cognisant of the simulation layout and avoid latent adverse events.

7 Conclusion

The review indicated that the establishment and execution of interprofessional CPD programmes should entail collaboration with a diverse range of professionals, stakeholders, regulatory bodies, and support services. This collaboration guarantees the programme's success and strengthens the principles of interprofessional collaborative practices by providing resources and knowledge. CPD empowers ICU teams to develop competencies, insights, and attributes that foster interprofessional collaboration and a culture of patient safety, thereby converting a culture of blame into opportunities for mutual learning. Furthermore, they build a conducive psychological environment where ICU teams thrive through collaboration and reciprocal respect. This improves retention and job satisfaction, ensures compliance with clinical guidelines, minimises adverse events, reduces hospital stays, and consequently decreases litigation costs and capital care expenses for ICU institutions, due to a shared mental model in the care of critically ill patients. Moreover, IPEC frameworks should be integrated into programme design, the formulation of learning objectives, and the incorporation into educational methodologies, assessment strategies, and student interactions to promote the development of interprofessional competencies among ICU teams in a specific, measurable, attainable, and sustainable manner. Thus, the interprofessional CPD programme facilitates crucial transformation in the dynamic ICU setting, requiring a collaborative team approach.

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