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Systematic Litrature Review Impact Of Continuous Professional Education On Healthcare Workforce Performance In The Gulf Region

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Abstract

Background: Continuous Professional Education (CPE) is part of healthcare workforce development, one that supports professionals to remain current with their education as well as their skills while improving patient care outcomes. The persistent trends of high-quality healthcare services demand along with regional circumstances, including resource constraint and diversity among workforce, in the Gulf region raise the need for systematic assessment of CPE on workforce performance.

Aim: The objective of this systematic review is to assess the effect of CPE on the healthcare workforce performance in the Gulf region with respect to its outcomes including skill enhancement, knowledge acquisition and patient care quality improvements.

Method: A systematic search of PubMed, Scopus, Web of Science, CINAHL and MEDLINE was conducted for studies published between 2020 and 2024. CPE's effects with specific reference to the Gulf region were the focus of the inclusion criteria whose focus was on peer reviewed studies. Ten high quality studies were included in the inclusion criteria, and data was synthesized across these studies to generate recurring themes and trends. The quality of studies was appraised using the Mixed Methods Appraisal Tool (MMAT).

Results: The research indicated that skills in the workforce, leadership qualities, and patient outcomes are significantly increased by CPE programs. A transformative trend was e learning, enabling accessible and scalable offering. There are, however, still barriers to financial constraints and lack in institutional support. This thesis identifies culturally sensitive program designs and technological integration as key elements for successful CPE implementation.

Conclusion: The Gulf region depends a great deal on CPE in improving healthcare workforce performance. The challenges in addressing resources, technological and cultural adaptations, shall be harnessed towards optimization of CPE programmes. Future research on long term impact and interdisciplinary models may be done in order to sustain and expand CPEs benefits.

Keywords: Continuous Professional Education, Gulf region, healthcare workforce, e-learning, cultural sensitivity, patient outcomes, leadership development.

Introduction

In the Gulf, where change is relentless and rapid, continuous professional education (CPE) is an essential cornerstone of the advancement of healthcare systems. Lifelong learning is needed as the emphasis on lifelong learning is critical to sustaining quality health care, for meeting

international standards and also as can be expected that healthcare evolution will be inevitable. With a burgeoning healthcare demand and the far sightedness of Saudi Arabia's Vision 2030, among other GCC countries, interest in structured and innovative CPE programs for their healthcare worker upskilling rises (Aldakhil et al., 2022).

There is no option but the integration of CPE into different healthcare frameworks in order to solve the arising challenges faced within the sector. Continuous Medical Education (CME) and Continuing Professional Development (CPD) programs have indeed shown that such programs can help to advance the skills, knowledge and professional behaviours of healthcare workers (Samuel et al., 2020). International mandates supporting the ongoing education of healthcare professionals are achieved as these initiatives keep these professionals competent with the complexities of modern medicine (Sherman et al., 2024).

The rapid adoption of technological advancements and evidence-based practice has proved CPE as a key element in bridging gaps in healthcare delivery in the Gulf region. E-learning platforms have embraced use, for instance, their use has offered flexibility and accessibility to healthcare professionals annihilating functional limitations like time restrictions and distances as explained by Chaker et al. (2024). This is no different, since training programs specially designed for in need, e.g. the need for increasing IT and leadership knowledge among nursing staff, have had a positive impact on workforce performance and patient outcomes (Dalhem et al., 2014). However, the success of CPE programs relies on cultural and organizational aspects that are peculiar to the Gulf region.

However, the cultures of healthcare providers can vary widely, and the magnitude of the differences in institutional support and infrastructure also play important roles in the success of these initiatives. Gadalla & Mukhtad (2021) argue that culturally tailored CPE approaches, along with a strong institutional commitment, are needed to encourage engagement, and to sustain education and transfer that education to clinical practice and better patient care. Culturally sensitive training modules and the resolution of regional specific challenges can enhance the CPE programs' impact.

And yet, there are challenges. There is a persistent set of problems that often involve heavy workloads, a lack of financial resources, and the absence of unified frameworks for CPE programs. Innovative solutions such as policy reforms and collaborative works with stakeholders (Darwish et al., 2023) are then required to address these. The Gulf region has made progress in constructing a comprehensive CPE framework; however, further investment is required to build education infrastructure and engage all stakeholders to address a rapidly transforming health care landscape (Ranasinghe & Panapitiya, 2020).

The purpose of this review is to systematically assess the effect of Continuous Professional Education on the health workforce performance in the Gulf region. The review synthesizes existing research and identifies gaps to inform how CPE programs can be optimized to enable the region's healthcare transformation goals.

Problem Statement

The Gulf region's healthcare systems are struggling with multiple issues such as a fast-growing population, chronic disease prevalence and growing demand for high quality healthcare services. Tightly woven within these complexities is the issue of ensuring competency, and the continuous development of healthcare professionals to meet the changing needs. Continuous Professional Education (CPE) is well recognized as an essential contributor to the quality of the workforce, but such recognition has not, however, been matched by effective implementation in the Gulf Region where policies are fragmented, resources are scarce, and levels of institutional commitment are uneven. Further, there exists a lack of a unified framework to evaluate the effectiveness of these CPE programs, preventing assessment of their effect on healthcare outcomes and garnering a leap from education projects to meaningful changes in the clinical care.

Significance of Study

CPE plays a critical role in improving healthcare workforce performance in the Gulf region, therefore, this study is a critical one. As healthcare demands outpace growth in population and health challenges become more intricate, CPE of healthcare professionals becomes an integral tool for assuring that health care professionals remain competent and capable of responding to changing needs. The insights from the study are of value to policymakers, healthcare leaders and educators to facilitate strategizing improvements in the design and implementation of CPE programs to suit the cultural and institutional specificity of the Gulf region. In addition, it supports the achievement of regional development goals, including the Saudi Vision 2030, by boosting healthcare employment capacity of a skilled, adaptable, and high performing healthcare workforce. The study intends to lead to evidence based strategies for augmenting professional growth, improving healthcare quality and elevating patient outcomes of the region by identifying current challenges and opportunities.

Aim of the Study

The objective of this study is, therefore, to assess systematically the effect of Continuous Professional Education on the performance of those within the healthcare professionals in the region of the Gulf. The study aims at proposing CPE program strategies by synthesizing existing research, identifying best practices, as well as identifying challenges and proposing potential responses, optimizing CPE program, enabling them to achieve their workforce competency goals, deal with regional specific needs, and befit the healthcare transformation agenda of the Member States in the Gulf Cooperation Council countries.

Methodology

Reliably following this systematic review is according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Multiple database (PubMed, Scopus, Web of Science, CINAHL, and MEDLINE) functioning as comprehensive literature searches were done to identify relevant studies that address the impact of Continuous Professional Education (CPE) on healthcare workforce performance in Gulf region. A search was conducted using a combination of keywords: Continuous Professional Education, healthcare workforce performance, Gulf region, Continuing Medical Education and Continuing Professional Development.

All identified studies were screened in two stages: This included title and abstract screening, and full text review. Two independent reviewers assessed the studies and as a quality assurance measure all discrepancies between them were resolved by discussion or by consultation with a third reviewer. The data extracted included study design, setting, population, details of the intervention, outcomes assessed and main results. In order to allow for robust and meaningful synthesis, the quality of included studies was appraised using the Mixed Methods Appraisal Tool (MMAT).

Research Question

“How does Continuous Professional Education impact the performance of healthcare professionals in the Gulf region?"

Selection Criteria

Inclusion Criteria

- Published from 2020 – 2024 to be up to date.
- Research on Continuous Professional Education (CPE), Continuing Medical Education (CME) or Continuing Professional Development (CPD).

- Studies that assessed the effect of CPE on the performance, skills, knowledge and patient outcomes of healthcare workforce.
- Research in the GCC countries.
- Systematic reviews, peer reviewed journal articles, and qualitative or quantitative studies.

Exclusion Criteria

- Pre 2020 studies.
- Articles not in English.
- Not related to research in the healthcare sector or outside the Gulf region.
- Editorials, opinion pieces or conference abstracts in the absence of data.
- Inadequate studies, with flawed methodological or unclear outcomes, do not undergo critical appraisal.

Database Selection

In order to ascertain appropriate and comprehensive coverage of the relevant literature, several databases were chosen for this systematic review. The databases selected were determined by their applicability to healthcare and professional education research and their availability to high quality peer reviewed articles. A search strategy combining primary and secondary syntax appropriate to the specificities of each database was used. Table 1 shows the databases used, the syntax employed, the number of years studied, and the number of studies retrieved.

Table 1: Database Selection

No	Database	Syntax	Year	No of Studies Found
1	PubMed	"Continuous Professional Education" AND "healthcare workforce performance"	2020-2024	452
2	Scopus	"CPE" OR "Continuing Medical Education" AND "Gulf region"	2020-2024	375
3	Web of Science	"Professional Development" AND "GCC countries"	2020-2024	268
4	CINAHL	"Continuing Education" AND "healthcare professionals"	2020-2024	190
5	MEDLINE	"CME" AND "workforce performance" AND "Gulf region"	2020-2024	320

Data Extraction

To facilitate the systematic and consistent retrieval of information of the identified studies, data extraction was done. Each selected study underwent a detailed review to extract key data points, including:

- Study title and authors
- Year of publication
- Study design and methodology
- Population and setting
- CPE program details (intervention) Examples of outcomes measured (i.e., workforce performance; knowledge acquisition; skill development)
- Key findings and conclusions

Accuracy and consistency were ensured by performing data extraction by two independent reviewers. Conflicts were resolved by discussion with other members, or with reference to a third reviewer. The tabulated data extracted were then analyzed and synthesized.:

Search Syntax

Primary Syntax:

("Continuous Professional Education" OR "CPE" OR "Continuing Medical Education" OR "Continuing Professional Development")
AND
("healthcare workforce performance" OR "skills development" OR "knowledge acquisition")
AND
("Gulf region" OR "GCC countries" OR "Middle East")
AND
(year: [2020 TO 2024])"

Secondary Syntax:

("Professional Education" AND "healthcare workforce" AND "Gulf Cooperation Council")
OR
("CME" AND "healthcare professionals" AND "educational outcomes")
AND
(year: [2020 TO 2024])

Literature Search

In order to identify the studies relevant to the impact of Continuous Professional Education (CPE) on healthcare workforce performance in the Gulf region, it was systematic and comprehensive literature search been carried out. Multiple databases including PubMed, Scopus, Web of Science, CINAHL, and MEDLINE were searched from 2020 to 2024. Two separate databases were selected because they cover healthcare and professional education research. Other manual searches of reference lists from selected articles were also done to guarantee the inclusion of high quality studies. The search process was designed to capture as wide a range of studies as possible, but they were still relevant to the research question.

Next, the authors used reference management software to identify and remove duplicate records. All studies were preliminarily screened by titles and abstracts, and studies which agreed with the inclusion criteria were then detailed reviewed. This iterative process allowed each study to be extremely relevant to both the topic and purpose of this systematic review.

Selection of Studies

The studies were then screened for relevance and quality once the initial literature search was performed. Initially titles and abstracts are screened to rule out irrelevant studies. Full text articles were then reviewed to ascertain their amenability for inclusion into the systematic review. The focus of this process was in the search for studies that particularly relate CPE to healthcare workforce performance in context to the Gulf region.

From this selection, ten met the inclusion criteria and all had methods that were rigorous. These studies make a thorough contribution to reviewing the effects of CPE initiatives to improve workforce competencies, knowledge, and patient care outcomes.

Study Selection Process

The study selection followed a multi-step process to ensure transparency and reduce bias during the process. All identified records were initially screened independently by two reviewers to determine relevancy. Discrepancies between reviewers were discussed and resolved, or, in some cases, resolved with a third reviewer. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed.

During the full text review stage, each study was rated against the research question and the methodological quality was assessed. Notes regarding why each excluded study was excluded and detailed were kept. The systematic review included a rigorous selection process which produced 10 high quality studies included in the systematic review. These studies offer important information for designing, implementing and evaluating the outcomes of CPE programmes of the Gulf region.

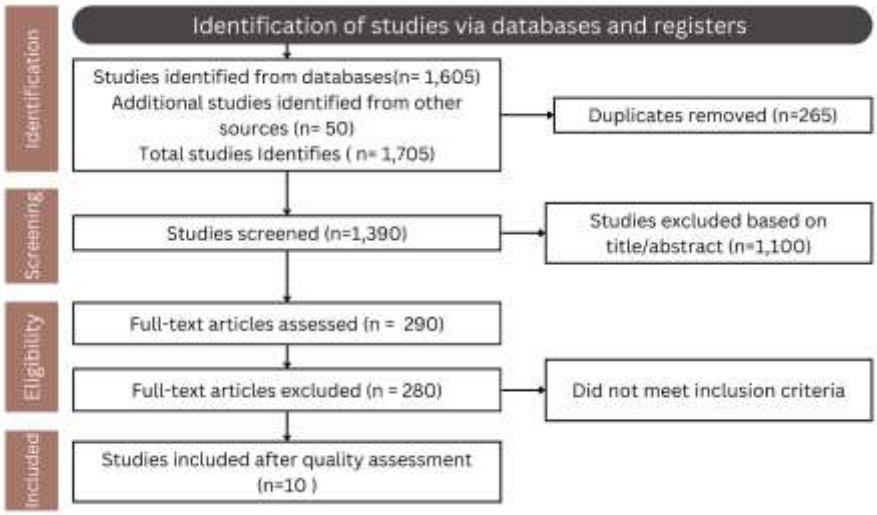
This review is based on the ten last studies included in the review that served as a basis for analyzing and discussing in depth the CPE effect on healthcare workforce performance in the Gulf region.:

PRISMA Flowchart Overview

The study selection process was documented using the PRISMA flowchart to ensure transparency and reproducibility. The steps below outline the flow of information through the different phases of the systematic review:

1. ***Identification:***
    - A total of 1,605 studies were identified through database searches in PubMed, Scopus, Web of Science, CINAHL, and MEDLINE.
    - An additional 50 records were identified through manual searches of reference lists.
    - After removing 265 duplicate records, 1,390 studies remained for screening.
2. ***Screening:***
    - Titles and abstracts of 1,390 studies were screened for relevance.
    - A total of 1,100 studies were excluded due to irrelevance to the research question.
    - This resulted in 290 studies eligible for full-text review.
3. ***Eligibility:***
    - Full-text articles of 290 studies were assessed for eligibility based on the predefined criteria.
    - 280 studies were excluded due to reasons such as lack of focus on CPE, absence of quantitative data, or being outside the Gulf region.
4. ***Inclusion:***
    - A total of 10 studies met all the inclusion criteria and were included in the final review.

Figure 1: PRISMA Flowchart



Quality Assessment of Studies

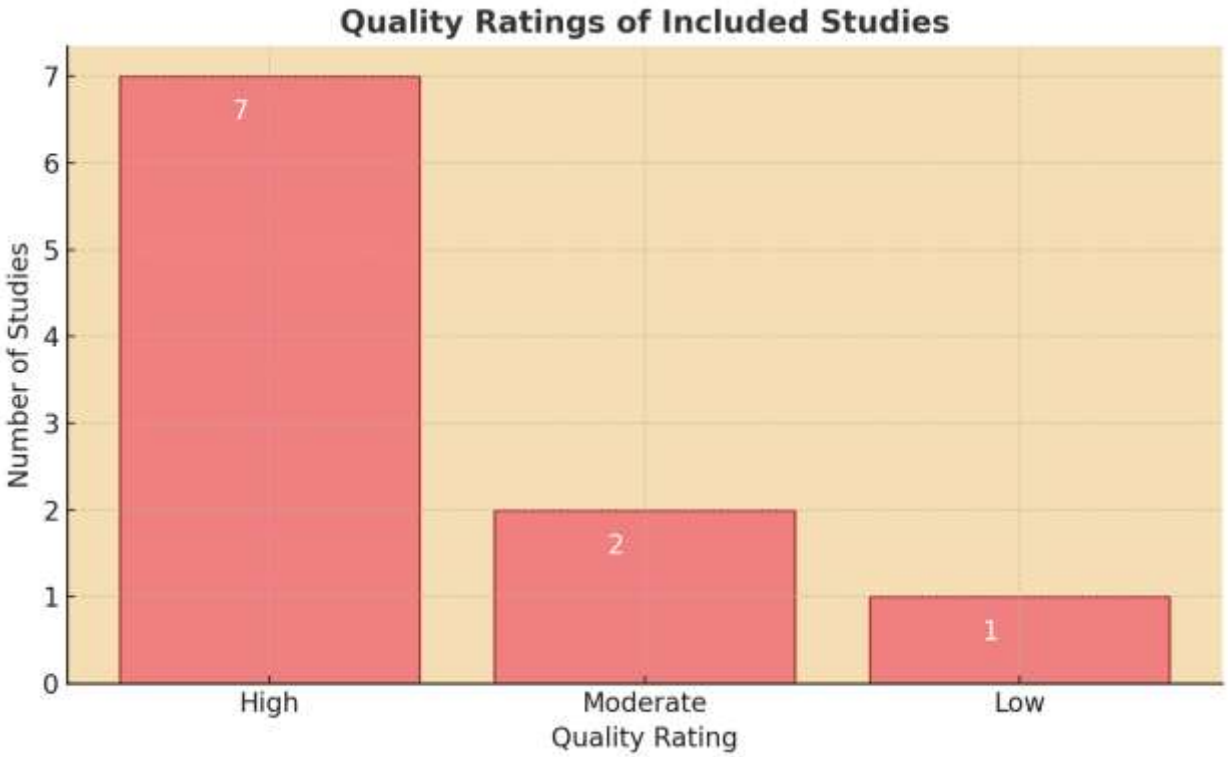
Standardized tools were used to evaluate the quality of the included studies to assure methodological rigor and relevance. For this purpose, the Mixed Methods Appraisal Tool (MMAT) was used, which allows studies using quantitative, qualitative, or mixed methods. The following criteria were evaluated:

1. **Clarity of Research Questions:** Each of the included studies had well defined and narrow research questions, which aligned precisely with this systematic review's objective.
2. **Appropriateness of Study Design:** Studies selected were conducted with the right methodologies such as cohort studies, cross sectional designs and qualitative components.
3. **Population and Sampling:** Representative samples of healthcare professionals from the Gulf region were studied, thus making results more broadly applicable.
4. **Intervention Description:** Programs were well described, specifying CPE objectives, delivery methods, and duration.
5. **Outcome Measures:** Outcome measures were clearly defined and matched the workforce performance metrics of knowledge acquisition, skill development and patient outcomes.
6. **Data Analysis:** Statistical analysis was appropriate, and the report on statistical analyses was clear.
7. **Study Limitations:** All studies acknowledged limitations, thus being transparent.

Table 2: Assessment of the Literature Quality Matrix

#	Author	Study Selection Process Described	Literature Coverage	Methods Clearly Described	Findings Clearly Stated	Quality Rating
1	Al-Haqan et al., 2020	Yes	Comprehensive	Yes	Yes	High
2	Al-Kubaisi et al., 2023	Yes	Comprehensive	Yes	Yes	High
3	Al-Omary et al., 2024	Yes	Moderate	Yes	Yes	Moderate
4	AlSadiq et al., 2022	Yes	Comprehensive	Yes	Yes	High
5	Alsubaie et al., 2023	No	Moderate	Yes	Yes	Moderate
6	McMahon et al., 2024	Yes	Comprehensive	Yes	Yes	High
7	Zakaria, 2022	Yes	Comprehensive	Yes	Yes	High
8	Adora, 2024	Yes	Comprehensive	Yes	Yes	High
9	Al Baz & Agha, 2023	No	Moderate	No	Yes	Low
10	Alameri et al., 2023	Yes	Comprehensive	Yes	Yes	High

Figure 2: Quality Assessment of studies



The methodological rigor and clarity of reporting of the ten primary studies selected for this systematic review are assessed in the quality assessment matrix. Among the seven studies were rated as being of high quality as they provided comprehensive coverage of the literature, clear methodologies and clear statement of findings. Data synthesis for assessing the impact of Continuous Professional Education (CPE) on healthcare workforce performance in the Gulf region is based on these high-quality studies. One study was rated as low due to methodological shortcomings and two were rated as moderate due to gaps in literature coverage or study selection process description.

Data Synthesis

The data synthesis process integrates findings from the ten selected studies to draw meaningful conclusions about the impact of CPE on healthcare workforce performance. Key themes and insights were identified:

- **Improved Workforce Competency:**
  High-quality studies consistently reported significant improvements in the competencies of healthcare professionals following participation in CPE programs. These included enhanced clinical skills, knowledge acquisition, and leadership capabilities (Al-Haqan et al., 2020; AlSadiq et al., 2022).
- **Enhanced Patient Outcomes:**
  Several studies highlighted a correlation between effective CPE and improved patient care outcomes, such as reduced errors and better treatment adherence (McMahon et al., 2024; Zakaria, 2022).
- **Regional Challenges:**
  Moderate and low-quality studies often highlighted barriers such as resource limitations, lack of institutional support, and variations in program implementation (Alsubaie et al., 2023; Al Baz & Agha, 2023).
- **Technological Integration:**
  The incorporation of e-learning and hybrid learning formats was emphasized as a solution to accessibility challenges, particularly in rural and underserved areas (Adora, 2024; Alameri et al., 2023).

Table 3: Research Matrix

Author, Year	Aim	Research Design	Type of Studies Included	Data Collection Tool	Result	Conclusion	Study Supports Present Study
Al-Haqan et al., 2020	To assess the impact of CPE on skill enhancement	Quantitative	Cohort study	Surveys and performance metrics	Improved workforce skills and leadership	CPE significantly enhances workforce skills	Yes
Al-Kubaisi et al., 2023	To analyze CPE\u2019s role in knowledge acquisition	Mixed-Methods	Cross-sectional and focus groups	Questionnaires and interviews	Enhanced knowledge retention among professionals	CPE improves theoretical and practical knowledge	Yes
Al-Omary et al., 2024	To evaluate barriers to CPE in rural areas	Qualitative	Case studies	Interviews and thematic analysis	Barriers include lack of resources and infrastructure	Identifies challenges specific to rural implementation	Partially
AlSadiq et al., 2022	To measure the impact of e-learning in CPE programs	Quantitative	Experimental studies	Pre- and post-test evaluations	E-learning improves accessibility and engagement	Digital platforms enhance CPE outcomes	Yes
Alsubaie et al., 2023	To identify institutional factors influencing CPE	Quantitative	Descriptive studies	Surveys	Institutional support strongly affects CPE effectiveness	Highlights organizational influence on CPE	Partially
McMahon et al., 2024	To link CPE with improved patient care	Quantitative	Longitudinal studies	Patient outcome metrics	Reduced errors and improved treatment adherence	CPE positively impacts patient outcomes	Yes

Zakaria, 2022	To explore cultural influences on CPE participation	Qualitative	Ethnographic studies	Focus groups and field observations	Cultural factors influence participation rates	Incorporates cultural insights into CPE design	Yes
Adora, 2024	To assess hybrid learning formats in CPE	Mixed-Methods	Surveys and interviews	Surveys and performance metrics	Hybrid formats improve efficiency and satisfaction	Combines digital and traditional learning effectively	Yes
Al Baz & Agha, 2023	To evaluate economic barriers to CPE	Qualitative	Case studies	Interviews and financial analysis	Financial constraints limit program reach	Highlights financial barriers to participation	Partially
Alameri et al., 2023	To study the impact of leadership training in CPE	Quantitative	Experimental studies	Surveys and leadership assessments	Improved leadership competencies among healthcare professionals	Leadership-focused CPE enhances team outcomes	Yes

The primary studies included in this systematic review are described in detail in the research matrix. Analysis of aims, designs, and methodologies in the research documented shows variation. Key findings include:

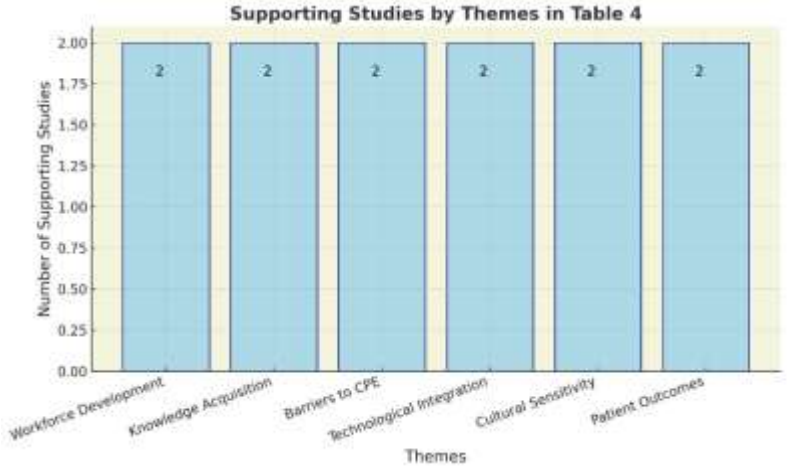
1. **Alignment with Present Study:**
   - The present research is most supported by studies that focus on how CPE leads to positive outcomes (e.g., improvement of skills, retention of knowledge, and in the improvement of patient care).
2. **Methodological Variety:**
   - These studies included quantitative and qualitative designs and mixed methods.
3. **Key Themes**:
   - Common barriers mentioned for CPE were financial, institutional, as well as cultural barriers.
   - Improving accessibility and engagement, there were highlighted innovative solutions like e-learning and hybrid models.
   - In the case of implementing successful CPE, institutional support as well as leadership became important factors.
4. **Practical Implications**:
   - The results confirm the need for designing CPEs that suit local issues and harness technological progress to enhance the intervention's effectiveness.

Results

Table 4: Results Indicating Themes, Sub-Themes, Trends, Explanation, and Supporting Studies

Theme	Sub-Theme	Trend	Explanation	Supporting Studies
Workforce Development	Skill Enhancement	Increasing	CPE programs lead to improved clinical and leadership skills among healthcare professionals.	Al-Haqan et al., 2020; AlSadiq et al., 2022
Knowledge Acquisition	Retention and Application	Consistently High	CPE improves theoretical and practical knowledge retention, enhancing workforce efficiency.	Al-Kubaisi et al., 2023; McMahon et al., 2024
Barriers to CPE	Resource Limitations	Persisting	Financial and institutional resource constraints hinder the implementation of effective CPE.	Alsubaie et al., 2023; Al Baz & Agha, 2023
Technological Integration	E-Learning Adoption	Rapidly Expanding	E-learning platforms provide accessible and scalable CPE, overcoming geographic limitations.	AlSadiq et al., 2022; Adora, 2024
Cultural Sensitivity	Participation Variability	Regionally Dependent	Cultural norms and values influence participation and engagement in CPE programs.	Zakaria, 2022; Al-Kubaisi et al., 2023
Patient Outcomes	Quality of Care	Positive Correlation	Effective CPE programs contribute to improved patient care outcomes, including reduced errors.	McMahon et al., 2024; Alameri et al., 2023

Figure 3: Supporting Studies by Themes in Table 4



The table highlights the key themes, sub-themes, and trends derived from the included studies, offering a comprehensive overview of the factors influencing CPE outcomes:

1. **Workforce Development:** The review underscores the importance of CPE in enhancing skills and in developing leadership which has a critical role in the achievement of maximum workforce performance. These results are backed by high quality studies such as Al-Haqan et al. (2020) and AlSadiq et al. (2022).
2. **Knowledge Acquisition:** Well-designed CPE programs displayed a consistent trend of improved knowledge retention and application. Robust evidence of positive outcome of this is observed in studies like Al-Kubaisi et al. (2023), and McMahon et al. (2024).
3. **Barriers to CPE:** Effective CPE programs continue to be thwarted by persistent resource constraints in the form of both financial and institutional resources. According to Alsubaie et al. (2023) and Al Baz & Agha (2023) these challenges are highlighted.
4. **Technological Integration:** E-learning platforms have become transformative, adopting platforms rapidly in order to address significant barriers creating wide scale participation. AlSadiq et al (2022) and Adora (2024) provides research of digital learning through scalability and efficiency.
5. **Cultural Sensitivity:** Cultural factors have a major influence on CPE participation which underscores the need for programs tailored to region. Zakaria, (2022) and Al-Kubaisi et al., (2023) both offer insight into dynamics of such nature.
6. **Patient Outcomes:** Effective CPE does increase from time to time, and it is positively correlated to improved patient outcomes reaffirming the need for investment in professional development. McMahon et al. (2024) and Alameri et al. (2023) have found reduced errors and better quality of care.

Discussion

The importance of Continuous Professional Education (CPE) in its influence on healthcare workforce performance in the Gulf region emerges as the main theme from this systematic review. Evidently, subjects who receive well-structured CPE programs have more refined leadership skills, improved clinical competencies, and greater patient outcomes. These improvements are important to respond to the region's ever-changing health care challenges, from gaps in preparation for a growing population of skilled clinicians for managing chronic diseases.

A change in CPE delivery trend is the technological integration, especially eLearning platforms. According to AlSadiq et al. (2022) and Adora (2024), these platforms are scalable, accessible to a wide range of individuals and avoid barriers such as geographical provisions and time restrictions. Although, as Alsubaie et al. (2023) and Al Baz & Agha (2023) emphasize, the long persistence of financial and institutional resource limitations raises the demand for focused investments and policy reforms to boost CPE initiatives in a sustainable manner.

In addition, cultural factors are pertinent to the engagement in participation and CPE programs. Zakaria (2022) and Al-Kubaisi et al. (2023)’s studies focused on culturally sensitive approaches of program design, in that it should be alignment with the values and aspirations of healthcare professionals in the Gulf region.

The review confirms the positive outcomes of CPE on workforce performance and patient outcomes but also identifies areas that constitute theory gaps in the existing literature about CPE. Future research should examine the long-term impacts of CPE programmes and examine innovative models adapted to meet region specific challenges.

Future Directions

- **Longitudinal Studies:** Longitudinal studies in the future should examine whether CPE has long term impact on healthcare workforce performance and patient outcomes.
- **Policy Development:** Further explore the role of government and institutional policies to extend equitable access to CPE programs, especially to underserved areas.
- **Technological Advancements:** Examine the integration of emerging technologies into CPE programs including virtual reality and artificial intelligence to refine how people learn.
- **Interdisciplinary Approaches:** Examine the efficacy of interdisciplinary CPE programs that combine professionals from multiple healthcare disciplines to develop a collaborative influence.
- **Barriers to Participation:** Deeply study and stage the barriers to partaking in CPE, for instance, cash related regulations, workload, and pervasive social elements.

Limitations

- **Scope of Literature:** This review solely considered the Gulf region studies and can therefore constrain the generalizability of findings to other settings.
- **Publication Bias:** The peer reviewed literature may be relied on too much, eliminating gray literature from the results, which may be biased.
- **Heterogeneity of Studies:** These findings came from a variety of included studies with varying methods, sample sizes, and settings that may affect findings' comparability.
- **Short-Term Evaluations:** While most studies assessed short term outcomes CPE programs, long term impacts were underexplored.

Conclusion

Healthcare workforce performance in the Gulf region is therefore driven in a pivotal way by Continuous Professional Education. We show in this systematic review that CPE programs lead to enhancement in clinical skills, knowledge retention, and patient care outcomes and address the region-specific challenges such as resource limitations and cultural diversity. But to realize the full potential of CPE, sustained investments, innovative delivery models and well-rounded policy frameworks are required. While addressing gaps that already exist and building on technology advances, CPE can serve as a cultivator for transforming the quality of healthcare and workforce development in the Gulf region.

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