Journal of Population Therapeutics & Clinical Pharmacology

**RESEARCH ARTICLE**
**DOI: 10.53555/jptcp.v30i17.2940**

# CONTINUING MEDICAL EDUCATION IN PAKISTAN: AWARENESS, CONSTRAINTS, AND NEED FOR REFORMS

**Tahera Ayub[1], Shirjeel Husain[2], Sahar Abbasi[3], Syed Akbar Abbas Zaidi[4*], Syed Zafar Abbas[5], Kulsoom Zahir[6]**

[1]BDS, FCPS (OMFS), DCPS (HCSM), Adv. Dip HPE, MHPE scholar, Professor Oral & Maxillofacial Surgery, Liaquat College of Medicine and Dentistry, Pakistan
[2]MBBS, FCPS, MHPE Scholar, Associate Professor Department of General Medicine, Liaquat College of Medicine and Dentistry, Pakistan
[3]BDS, MCPS-HPE, Deputy Director, College of Physicians & Surgeons Pakistan
[4*]BDS, MHPE, Assistant Professor, Department of Dental Education, Bahria University Health Sciences, Pakistan
[5]BDS, MCPS, Assistant Professor Oral Medicine, Dow International Dental College, Pakistan
[6]BDS, CHPE, Lecturer, Department of Dental Education, Bahria University Health Sciences, Pakistan

***Corresponding author:** Dr. Syed Akbar Abbas Zaidi
*Bahria University Health Sciences adjacent PNS Shifa Hospital,Sailor street , DHA khi.
Email: akbrabbas_91@hotmail.com

**Abstract**

**Objective:** The study aims to determine the level of awareness amongst health care providers including academicians, clinicians, under and post-graduate students of medicine, dentistry, nursing, and allied health sciences across Pakistan. Furthermore, the study will conclude the constraints and barriers in way of establishing a strong continuing education culture in our institutes in Pakistan while need for reforms will also be addressed.

**Study Design:** This cross-sectional study following STROBE statement

**Place and Duration of the Study:** Liaquat College of Medicine and Dentistry and duration from 3rd January 2021 till 12th march 2021.

**Methodology:** Mixed methodology design was employed comprises of the focus group discussion which was undertaken amongst 30 participants to communicate the qualitative section whilst a comprehensive online questionnaire with close ended questions was made and gathered responses from 384 participants to quantify the results and makes it more genraliseable.

**Results:** Results were suggestive of the fact that awareness amongst health care professional including academicians, post-graduate, under-graduate students, and clinicians was 69%-44%, however, the constraining factors are about 62% participants believe is lack of separate regulating bodies and most individuals are highly doubtful regarding the credibility of the sources of CME that are currently conducting CME sessions in Pakistan. Whilst 63% respondents feels that barrier can be handled effectively by making the reforms and ensure their effective implementation.

**Conclusion:** The constraining factors in strengthening of continues professional development and evidence based practises in Pakistan are lack of separate regulating bodies and most individuals are highly doubtful regarding the credibility of the sources of CME that are currently conducting CME

sessions in Pakistan. The barrier can be handled effectively by making the reforms and ensure their effective implementation.

**Keywords:** Health care professionals, CME, EBP (Evidence-Based Practice)

## Introduction

Continuing medical education (CME) is known as the complete process in which healthcare professionals including physicians, surgeons, and allied healthcare staff involved themselves in certain activities planned that will support the advance educational training as in continuing professional development [1-3]. Such activities may comprise of multiple instructional domains that are based on learning-centered and get support within the capability of those who have a professional qualification and enable to maintain that with showing high quality, comprehensive patient care services to the general public and towards their profession as well [4,5]. Furthermore, continuing medical education comprises of various educational and interactive activities that may serve to develop yet maintain or enhance the skills, knowledge, and other professional performance [6]. It is also helpful in developing a professional relationship with patients, staff, and other professionals [4,7]. The CME will improve the system to care by delivering and effectively deal with a career as ever-changing working criteria in the medical industry. Specifically, continuing medical education enables redefining the skills of the healthcare professional in that way they can improve the patient care system[8]. Along with that CME also keep professionals updated with the current and latest development related to health science. It enables them to address difficult situations faced in the day-to-day situation and also identifying possible solutions for that. CME will provide significant professional growth which ultimately advances the career status [9].

In Pakistan, it has been always noticing that the skills, capability, knowledge, and services are delivered in a limited amount, with minimum check and balance. Researchers have been identified that physicians' clinical practice has not been updated and there is a gap between advancement and routine health care patterns in Pakistan [10]. To maintain the quality of healthcare practice the College of Physician and Surgeons of Pakistan have emphasized Continuing Medical Education (CME) for every healthcare workers [8]

## Objectives

The following study aims to determine the level of awareness regarding CME practises amongst health care providers including academicians, clinicians, under- graduate and post-graduate students of medicine, dentistry, nursing, and allied health sciences in Pakistan. Furthermore, the study will conclude the constraints and barriers in way of establishing a strong continuing education culture in our institutes in Pakistan. Nevertheless, the study will also shed light on areas of further improvements by taking evidence from continuing health education patterns followed in European countries.

## Methodology

To incorporate the diverse objectives of the study and gather as much information as possible the methodology employed is a mixed methodology following STROBE statement [11], however, the essence of the qualitative approach is also included [6]. A focus group discussion was conducted comprising of 30 participants equally taken from medical, dental and nursing and allied health sciences department of Liaquat College of Medicine and Dentistry. A focused group discussion was held via zoom meeting and the inclusion criteria were independent of age and gender while participants were under-graduate, post-graduate, academicians or clinicians equally participating in the discussion session.

The discussion session was of 60 minutes duration and responses were recorded to generate themes effectively. The themes that were extracted then utilised in designing questionnaires for quantitative

survey study to expand and gather generalizable results. A detailed comprehensive questionnaire was designed which included closed-ended questions; furthermore, the close-ended question were mostly designed using the Likert scale to enhance the reliability and ease of gathering more responses. The questionnaire was based on pre-established themes by thorough focus group discussion via deductive approach.

An online questionnaire (annexure 1) is made and circulated to the corresponding health care facilities and institute all over Pakistan through digital media and emails.

**Sample Size Calculation**

The study sample was calculated via using open-epi software, using the Cochran's Sample Size Formula as there were no population censuses provided, $n_o$ $Z^2pq/e^2$ , ((1.96)2 (0.5) (0.5)) / (0.05)2 = 385.

**Inclusion Criteria**

- Health care professionals associated with teaching institutes
- Medical, dental and nursing, and allied health sciences.
- Undergraduate students
- Post graduate students
- Academician
- Clinician

**Exclusion Criteria**

- Clinician or medical, dental, nursing personals not associated with any teaching institutes

**Results**

Table 1 shows the qualitative analysis. The first theme was to establish the apprehension of the level of awareness among health care workers regarding the significance of continue medical education and results shows that about 69% to 44% of individuals believe that the CME sessions are based on evidence-based practice and according to their perspective CME helps in building innovation and advancement in the field of health care. However, 30% of respondents believe that it helps in expanding clinical knowledge, 10% did not respond since these respondents never attended any CME sessions. Considering effective CME sessions arranged in their respective institutes 50% of respondents were satisfied with the quality and quantity of CME sessions arranged by their institute while concerning the fact that frequency of attending CME sessions among health care professional is considered moderate and 50% of respondents attends 2 to 4 sessions per year and 28% even participated in more than 5 sessions per year. To establish a firm stance on knowledge about international CME among health care providers results shows that for about 67% of respondent have an experience of attending international CME, and results show that 15% respondent feels that the international CME are more systemic, comprehensive and interactive when compared to that of they attend in Pakistan.

The second theme that was intended to recognize the constraints and barriers in the sustained development of CME in Pakistan and responses of health care professionals suggest that the most associated constraining factor was identified to be the lack of interactive sessions i-e; 62%, inability to utilize tools and advance equipment in CME sessions 30%. Furthermore, 62% of respondents find CME more costly and least interactive.62% of respondents thinks ineffective small group sessions and inability to conduct feedback sessions is one a the cause of failure of CME based learning in Pakistan. 50% agree and 33% strongly agree with the statement that making CME least costly and more interactive would result in good learning outcomes.

The third theme that was identified via discussion sessions with health care professionals was the need for reforms that enabling beneficial learning experiences through CME. The primary purpose

was to bridge the gap between learners and governing bodies; it was advised there is a need for a separate governing body that will provide CME accreditations to the participants which are affiliated with higher education commission and Pakistan medical associations. 50% of respondents were in favour of the development of the organising body to enhance the credibility of CME and make reforms that will take initiatives in making CME more comprehensive and least costly. 53% agree and 16% strongly agreed with the statement that there must be report writing and feedback sessions to improve the learning outcomes and serves the purpose of developing effective health professional with maximum knowledge and understanding of innovations regarding the medical sciences. Nevertheless, 63% of respondents agree with the suggestion that certain mandatory CME points should be included in the degree program and clinical practice license renewal. However, 18% of respondents disagree with the suggestion of making CME points mandatory for license renewal or degree program.

The quantitative analysis is undertaken via measuring frequencies and presented in means and SD with 95% confidence intervals. The quantitative results were suggestive of the level of awareness regarding purpose of CME amongst health care professionals is certainly moderate and, huge percentages of professionals desire the reforms that enable effective learning outcomes (Table 2-4).

**Table 1Table 1-thematic analysis and coding**

| QUESTIONS | RESPONSES | THEMATIC CODES |
|---|---|---|
| **What is CME, your perspective?** | It is moreover a way to introduce innovations and advancements in practices.<br>It helps in building knowledge about new tech-tools and their application in clinical practices.<br>It is based on a foundation of evidence-based practice to enhance good health outcomes.<br>CME helps in expanding knowledge and provides new approaches to the service users. | Awareness Of CME Amongst Health Care Professionals |
| **What are the factors that appear to hinder the effective CME programs in Pakistan when compared to other countries?** | Insufficient use of essential tools and equipment in hands-on sessions.<br>The education purpose cannot be fulfilled by only focusing on providing the CME points; however, the focus must be shifted towards learning and exploring knowledge.<br>The cost also appears to be the barrier in way of learning since CME is more costly and less interactive.<br>The designing of sessions is not systemic and there arises a question of the reliability of the source and conducting body. | Constraints in Sustainable Development Of CME in Pakistan |
| **What are the factors that lack in CME conducted in institutes of Pakistan?** | Cost and quality are highly diverse, not all institutes tend to hold effective sessions in this regard.<br>There are concerns regarding the credibility of the source since not every CME points are credible.<br>Participants are seemingly uncertain of the reliability of the source.<br>The sessions are mostly held in larger groups that constraints learning and are least interactive. | |
| **Distinguishing features of international CME sessions?** | The international sessions are more systemic and interactive when compared to those held in Pakistan.<br>International programs are more knowledge-based and deliver knowledge in the most compact ways.<br>International sessions are held under one governing body which ensures effective CME accreditations.<br>They were more comprehensive and based on EBP. | |
| **What needs to be done to strengthen the learning outcomes through CME in Pakistan?** | Sources should attempt to make more systemic programs and ensure making cost-effective sessions.<br>The focus should be given to the development of a single institute that provides credible accreditations and affiliation from PMA, CPSP, or HEC. | Need For Reforms To Enhance CME Based Learning Experiences In Pakistan |

The programs should be held and conducted periodically in a systemic way on frequent intervals corresponding to every healthcare discipline.
The learning experience can be made effective by utilization of EBP and advance tech-tools to maintain the standards comparable to international sessions.
The most effective way would be practicing report writing/presentations/group discussions regarding the learning outcomes from the CME sessions.
Report writing and other interactive sessions will enhance learning and also polished other writing and presentation skills of the participants
Efforts should be given to incorporate mandatory CME points in under-graduate, post-graduate degree programs.
The mandatory CME points; academicians and clinicians should also be encouraged to attend CME and these points will help in the renewal of their practicing or teaching license.

**Table 2 Development of HEC/PMDC Affiliated Body Which Provide Valid CME Accreditations**

**The development of separate HEC/PMDC affiliated body which provide valid CME hours accreditations**

| | | Frequency | Percent | Valid Percent | Cumulative Percent | Bootstrap for Percent[a] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bias | Std. Error | 95% Confidence Interval | |
| | | | | | | | | Lower | Upper |
| Valid | Agree | 700 | 53.8 | 53.8 | 53.8 | .1 | 1.4 | 51.3 | 56.5 |
| | Disagree | 70 | 5.4 | 5.4 | 59.2 | .0 | .6 | 4.2 | 6.6 |
| | Neither agree nor disagree | 220 | 16.9 | 16.9 | 76.2 | .0 | 1.0 | 14.9 | 18.8 |
| | Strongly Agree | 260 | 20.0 | 20.0 | 96.2 | .0 | 1.1 | 17.8 | 22.1 |
| | Strongly disagree | 50 | 3.8 | 3.8 | 100.0 | .0 | .5 | 2.8 | 4.9 |
| | Total | 1300 | 100.0 | 100.0 | | .0 | .0 | 100.0 | 100.0 |

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

**Table 3 Feedback Session and Report Writing Activity to Enhance Learning Outcomes**

**CME that focus more on involving participants in collaborative learning by arranging feedback session and reflective report writing activity to enhance learning outcomes**

| | | Frequency | Percent | Valid Percent | Cumulative Percent | Bootstrap for Percent[a] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bias | Std. Error | 95% Confidence Interval | |
| | | | | | | | | Lower | Upper |
| Valid | Agree | 203 | 52.7 | 52.7 | 52.7 | .1 | 2.6 | 48.1 | 57.9 |
| | Disagree | 3 | .8 | .8 | 53.5 | .0 | .5 | .0 | 1.8 |
| | Neutral | 99 | 25.7 | 25.7 | 79.2 | -.1 | 2.2 | 21.3 | 30.1 |
| | Strongly Agree | 61 | 15.8 | 15.8 | 95.3 | -.1 | 1.9 | 12.2 | 19.5 |
| | Strongly disagree | 18 | 4.7 | 4.7 | 100.0 | .0 | 1.1 | 2.6 | 6.8 |
| | Total | 385 | 100.0 | 100.0 | | .0 | .0 | 100.0 | 100.0 |

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

**Table 4 Mandatory CME Point in Degree Programs and For License Renewal**
**CME that focus more on involving participants in collaborative learning by arranging feedback session and reflective report writing activity to enhance learning outcomes**

| | | Frequency | Percent | Valid Percent | Cumulative Percent | Bootstrap for Percent[a] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bias | Std. Error | 95% Confidence Interval | |
| | | | | | | | | Lower | Upper |
| Valid | Agree | 203 | 52.7 | 52.7 | 52.7 | .1 | 2.6 | 48.1 | 57.9 |
| | Disagree | 3 | .8 | .8 | 53.5 | .0 | .5 | .0 | 1.8 |
| | Neutral | 99 | 25.7 | 25.7 | 79.2 | -.1 | 2.2 | 21.3 | 30.1 |
| | Strongly Agree | 61 | 15.8 | 15.8 | 95.3 | -.1 | 1.9 | 12.2 | 19.5 |
| | Strongly disagree | 18 | 4.7 | 4.7 | 100.0 | .0 | 1.1 | 2.6 | 6.8 |
| | Total | 385 | 100.0 | 100.0 | | .0 | .0 | 100.0 | 100.0 |

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

## Discussion

In Pakistan, the health authorities are working their best to enable the CME interesting for all healthcare professionals. It has been recognized that learning activities can be sought by using formal learning activities as well as informal learning activities[12]. For instance, the formal activities usually comprise of learning which can be achieved with the reforms and affiliation of such important institutions such as PMDC, CPSP, PMA, and other medical colleges and universities [13]. Whereas, the informal activities comprised of internet point of care (POC) research, journal clubs, and decision making. For improving the significance of CME in Pakistan, it is mandatory that all medical agencies, professionals enables to dexterity the ministry of health to incorporate and implement CME for students so that medical professional develop an interest in upgrading their knowledge and skills according to the demand. These days, the CME requires change and that is related to 'patient care and having a healthy lifestyle'[1]. Furthermore, the PMDC was not provided with any infrastructure or roadmap for gaining CME points to any institutions or doctors related to the nature of qualification and job description demanding for continuing medical education[13]. Although, there were no facilities given for offering online training that was recognized or planned by the regulatory body before applying the decision[14].

It is evident that, to implement the policy of CME; Pakistan Medical Association showed promising commitment in their central council meeting. The PMDC management has decided to come up with an easier method for CME credit and registration required for renewal[15]. To avoid the difficulty of managing time and traveling for such courses the PMDC provides an online platform for online training facilities by the PMDC trainers. Along with that, the PMDC management develops this hope that this new move will ultimately help in lessening the undue anxiety in the implementation of the CME in the medical profession[16].

In this era, continuing and updating knowledge has great importance. As knowledge related to the medical field is advancing day by day hence, the healthcare professional must keep them updated with recent knowledge and skills for providing appropriate care to patients. Researchers have also concluded that the world is changing at a rapid pace specifically medical science which now particularly focuses on knowledge, skills, and attitude [17] [18]. The purpose of CME is to develop new knowledge with existing knowledge [19].

Considering international standards for conducting CME is entirely different when compared to that of Pakistan, there is an entirely separate body which enclosed every aspect of continuing education

of every health care discipline that is Continuing Dental Education (CDE), Continuing Nursing Education (CNE), Continuing Medical Education (CME), Continuing Education (CE) and Continuing Pharmacy Education (CPE) and it all comes under the umbrella of CPD Continuing Professional Development which not only focuses on developing effective medical or dental clinicians [20]. Unlike the Pakistan United Kingdom has a separate regulating body of CPD that is supervised by the central NHS national health services paradigm. The CPD programs are effectively regulated and made mandatory for all health professionals to ensure sustainable development in the practice of every health care provider [21]. In the UK several governing bodies provide accreditations' to the continuing professional education including accreditations from the Royal College of Surgeons England, peer-reviewing from experienced registered surgeons panel, and RCS portal, however, the central governing body of NHS regulated and acridities every CPD sessions [14].

The CPD is considered mandatory for all health care professions since the renewal of licensing and another practice is based on the number of CPD points gained by the health care professional. Nevertheless, these CPD events include personal research. Teachings, clinical activities, local events, seminars, and conferences, every hour of CPD is considered as 1 point of CPD. There is a compulsion for every general practitioner in the UK to display a minimum of 50 CPD points to pursue further in their clinical practice [22]. There is a strong law under the central governing body to maintain a clinical portfolio which has all the information regarding CPD events and point, furthermore, the noteworthy aspect of CPD is it can be raised to double in the case where the clinician shows evidence of employing professional development information they learned through a CPD. This practice of effective feedback and check and balance will not only ensures effective participation but also enhance the desire to learn and implement evidence-based practice on the clinical ground by every health care provider [23] [24]. The governing body must include every health care discipline just like we observe in European countries where CPD (continuous professional development) a separate institute is held responsible for sustainable regulation of health education programs [4] [25].

For future advancement in future, it is important to consider the following points; the health authorities and government of Pakistan have to make sure about providing quality of health and introducing programs that may pertain to cognition skills and attitudes conducting through experts in medical education [26]. All the health policies need to be incorporated and have been used in updating the knowledge of medical professionals specifically in some remote areas of the country. All the stakeholders will be provided with a podium that enables help and provides opportunities for facilitating the CME program available for all [27].

## Conclusion

In conclusion, the awareness among health care professional including academicians, post-graduate, under-graduate students, and clinicians was found to be sufficient, however, the constraining factors are lack of separate regulating bodies and most individuals are highly doubtful regarding the credibility of the sources of CME that are currently conducting CME sessions in Pakistan. The barrier can be handled effectively by making the reforms and ensure their effective implementation.

## Limitations

The study results are limited to health care professionals of medical, dental and nursing, and allied health sciences and cannot be applied to the pharmacy, physiotherapy, chiropractors, and another discipline. However, further studies incorporating focus interviews can be conducted to establish more comprehensive results and gather more ideas and diverse perspectives which will provide further ground for improvement in the area of interest.

***Patient Consent***

"You are invited to participate in a research study about "Continuing Medical Education in Pakistan: Awareness, Constraints and need for Reforms". Participating in this study may not benefit you directly, but it will help us learn about areas of improvement in CME programs. We expect that this would not be different from the kinds of things you discuss with colleagues. Participation in this study is voluntary. If you agree to participate in this study you may continue with the questionnaire or you may end the interview at any time. If you have any questions about this study, please contact the corresponding person".

***Name of the Approval Committee***

Institutional review board of Liaquat College of Medicine And Dentistry, Karachi

***Authors Contributions***

**Tahera Ayub** has substantial contributions to the conception and design of the work and constructing central idea of the work, whilst **Shirjeel Husain** structured the study and designed questionnaire. **Sahar Abbasi** did the manuscript writing.

The acquisition, analysis, or interpretation of data for the work was done by **Syed Akbar Abbas Zaidi**, and **Syed Zafar Abbas** aided in circulation and ensured the effective data collection and conducted focus group interviews with assistance of **Tahera Ayub** and **Kulsoom Zahir.**

Final drafting was done by **Syed Zafar Abbas** with coordination of **Kulsoom Zahir** and **Shirjeel** whilst the proofing and revision of the draft after editing mandatory information was done by **Syed Akbar Abass Zaidi**

**Conflict of Interest**

There was no conflict of interest within the study.

**Acknowledgements**

Shahzeb Qamer (senior research analyst) for assistance and support in research conduction

**References**

1. Mazmanian, P.E.; Davis, D.A.; Galbraith, R. Continuing medical education effect on clinical outcomes: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest* **2009**, *135*, 49S-55S.
2. Ahmed, N.; Rizvi, A.; Naeem, A.; Saleem, W.; Ahmed, A.; Parveen, S.; Ilyas, M. COVID-19 and public awareness. *The Professional Medical Journal* **2020**, *27*, 1710-1716.
3. Rizvi, A.; Ahmed, N.; Naeem, A.; Saleem, W.; Ilyas, M.; Ahmed, A. A cross sectional study to evaluate awareness about hepatitis A & E among students in lahore. *Pakistan Journal of Public Health* **2020**, *10*, 160-166.
4. Golestaneh, L.; Cowan, E. Hidden conflicts of interest in continuing medical education. *The Lancet* **2017**, *390*, 2128-2130.
5. Zeb, S.; Mushtaq, M.; Ahmad, M.; Saleem, W.; Rabaan, A.A.; Naqvi, B.S.Z.; Garout, M.; Aljeldah, M.; Al Shammari, B.R.; Al Faraj, N.J. Self-Medication as an Important Risk Factor for Antibiotic Resistance: A Multi-Institutional Survey among Students. *Antibiotics* **2022**, *11*, 842.
6. Kidanu, A.W.; Kidanu, T.W.; Butler III, J.; Dyer, T.V. A qualitative analysis of Ethiopian and Eritrean Americans' initiation and continuation of hookah smoking. *Journal of Ethnicity in Substance Abuse* **2021**, 1-19.
7. Ataei, M.; Saffarian-Hamedani, S.; Zameni, F. Effective teaching model in continuing medical education programs. *Journal of Mazandaran University of Medical Sciences* **2019**, *29*, 202-207.

8. Ali, S.A.; ul Fawwad, S.H.; Ahmed, G.; Naz, S.; Waqar, S.A.; Hareem, A. Continuing medical education: A cross sectional study on a developing country's perspective. *Science and Engineering Ethics* **2018**, *24*, 251-260.
9. Shah, N.; Ashraf, H.; Anwar, F.; Khan, A.; Akhtar, H.; Abrd, M.A. Status of Postgraduate Training and Continuing Medical Education of Family Physicians in Pakistan. *Pakistan Journal of Medical Sciences Quarterly* **2012**, *28*, 4.
10. Lim, S.C.; Mustapha, F.I.; Aagaard-Hansen, J.; Calopietro, M.; Aris, T.; Bjerre-Christensen, U. Impact of continuing medical education for primary healthcare providers in Malaysia on diabetes knowledge, attitudes, skills and clinical practices. *Medical education online* **2020**, *25*, 1710330.
11. Casey, A.-N.; Islam, M.M.; Schütze, H.; Parkinson, A.; Yen, L.; Shell, A.; Winbolt, M.; Brodaty, H. GP awareness, practice, knowledge and confidence: evaluation of the first nation-wide dementia-focused continuing medical education program in Australia. *BMC family practice* **2020**, *21*, 1-16.
12. Lovell, B. What do we know about coaching in medical education? A literature review. *Medical Education* **2018**, *52*, 376-390.
13. Ismail, F.W.; Abid, S.; Mawani, M.; Jafri, W.; Hamid, S.S. Training in emerging advances in chronic hepatitis C infection in Pakistan: the Teach-Pak project. *Advances in medical education and practice* **2018**, *9*, 99.
14. Dowling, S.; Last, J.; Finnegan, H.; Bourke, J.; Daly, P.; Hanrahan, C.; Harrold, P.; McCoombe, G.; Cullen, W. How does small group continuing medical education (CME) impact on practice for rural GPs and their patients, a mixed-methods study. *Education for Primary Care* **2020**, *31*, 153-161.
15. Kilminster, S.M.; Jolly, B.C. Effective supervision in clinical practice settings: a literature review. *Medical education* **2000**, *34*, 827-840.
16. Collins, C.S.; Nanda, S.; Palmer, B.A.; Mohabbat, A.B.; Schleck, C.D.; Mandrekar, J.N.; Mahapatra, S.; Beckman, T.J.; Wittich, C.M. A cross-sectional study of learning styles among continuing medical education participants. *Medical teacher* **2019**, *41*, 318-324.
17. Murray, R. Report on proceedings of the tenth annual European CME Forum, Dublin, Ireland, November 2017. **2018**.
18. Latif, M.Z.; Wajid, G. Reforming medical education in Pakistan through strengthening departments of medical education. *Pakistan Journal of Medical Sciences* **2018**, *34*, 1439.
19. Wilbur, K.; Elmubark, A.; Shabana, S. Systematic review of standardized patient use in continuing medical education. *Journal of Continuing Education in the Health Professions* **2018**, *38*, 3-10.
20. Lucero, K.; Cason, C.; Marshall, T. EU doctors' learning preferences and implications for continuing medical education. In Proceedings of the 11th Annual European CME Forum in London, England (November 2018).[Google Scholar], 2019.
21. Filipe, H.P.; Golnik, K.C.; Mack, H.G. CPD? What happened to CME? CME and beyond. *Medical teacher* **2018**, *40*, 914-916.
22. Frank, J.R.; Snell, L.; Englander, R.; Holmboe, E.S.; Collaborators, I. Implementing competency-based medical education: Moving forward. *Medical teacher* **2017**, *39*, 568-573.
23. Godfrey, M.; Rosser, A.A.; Pugh, C.M.; Shaffer, D.W.; Sachdeva, A.K.; Jung, S.A. Teaching practicing surgeons what not to do: An analysis of instruction fluidity during a simulation-based continuing medical education course. *Surgery* **2019**, *165*, 1082-1087.
24. Upenieks, R. EXPLORING POSSIBILITIES OF TRANSFORMATIVE LEARNING IN CONTINUING MEDICAL EDUCATION: A LITERATURE REVIEW. *Innovations, Technologies and Research in Education* **2019**, 703.
25. Hamdani, S.U.; Zill-e-Huma; Warraitch, A.; Suleman, N.; Muzzafar, N.; Minhas, F.A.; Psych, F.; Nizami, A.T.; FCPS; Sikander, S. Technology-assisted teachers' training to promote socioemotional well-being of children in public schools in rural Pakistan. *Psychiatric Services* **2021**, *72*, 69-76.

26. McGaghie, W.C.; Issenberg, S.B.; Petrusa, E.R.; Scalese, R.J. A critical review of simulation-based medical education research: 2003–2009. *Medical education* **2010**, *44*, 50-63.
27. Memon, A.R.; Rathore, F.A. Moodle and Online Learning in Pakistani Medical Universities: An opportunity worth exploring in higher education and research. *Journal of the Pakistan Medical Association* **2018**, *68*, 1076-1078.

**Objective True/ False Questions**

1. CME that focus on involving participants in collaborative learning by arranging feedback session and reflective report writing (T / F).
2. There is separate HEC/PMDC affiliated body which provide valid CME hours accreditations to every health care discipline (T / F).
3. CPD is an example of continuous professional development body that is affiliated by HEC and PMC providing credible credit hours and standardized continuous professional development activities equivalently in Pakistan following standardized schedule, curriculum and TOS for all health care professionals (T / F).
4. The purpose of CME is keeping practice up to date by introducing new evidence-based clinical tools and techniques in daily practice (T / F).