

Principles and Practice of Clinical Research

A Global Journal in Clinical Research



PPCR

ISSN: 2378-1890

An Interactive Blended Medical Educational Program for Family Medicine Physicians in the Sudan Medical Specialization Board (SMSB)

MB. Mansour^{1*}, A. Marduy², SE. Ahmedana³, MH. Mahmoud⁴, F. Fregni⁵

1 Primary Health Care Corporation, Umm Ghuwailina Health Center- Doha-Qatar

2 União Metropolitana de Ensino e Cultura (UNIME) Salvador, Bahia, Brazil. email: anna.marduy@gmail.com

3 Primary Health Care Corporation, Abu Baker Al-Siddiq Health Center- Doha-Qatar. sararmusa97@yahoo.com

4 Primary Health Care Corporation, Workforce Training and Development & Family Medicine Residency Training Program-Doha-Qatar. mohamed.hashim@ppcr.org

5 Laboratory of Neuromodulation, Spaulding Rehabilitation Hospital, Harvard Medical School, Boston, USA. felipe.fregni@medicalTLLI.org

*Corresponding author: Musa B. Mansour. P.O. Box 26555 [School of Medicine, Ahfad University for Women, Omdurman – Sudan] Email: musbasheer97@yahoo.com

Received August 28, 2020; accepted October 15, 2020; published November 12, 2020.

Abstract:

Introduction: Continuing Medical Education (CME) and Continuing Professional Development (CPD) are methods included in the revalidation, retention, and refinement of medical skills, after formal academic training. These approaches have become essential tools for medical practice, especially for Family Medicine physicians. Family Medicine physicians often report professional practice gaps regarding their role in applying guideline recommendations in primary care. Keeping this in mind, this is the protocol for a new CME program. Objectives: To propose developing a blended-learning CPD course that aims to recognize the learning needs of Family Medicine physicians in Sudan and bolster their learning experience to improve their medical practice in the primary healthcare setting.

Methods: This is a proposal for the protocol of a new blended-learning CME program. We propose a longitudinal 40-week course that will address the topics of diagnosis, the latest laboratory tests, and procedural skills that Family Medicine physicians must have based on international recommended guidelines. The course entails a blended learning method, including various teaching and learning styles, and includes face-to-face lectures and online forum discussions of current Family Medicine guidelines.

Discussion: The current emerging scenario of Family Medicine and CPD programs in Sudan allows for the development of this program for family physicians. The blended learning style of the CPD facilitates the implementation of guideline recommendations and multidisciplinary referral in the primary care medical practice. Although implementing a CME/CPD program is challenging, this course focuses on simple, student-centered approaches to implement recommended guideline practices and improve family physicians' healthcare outcomes in Sudan.

Keywords: Continuing Medical Education; Continuing Professional Development; Family Medicine Physicians; Sudan Medical Specialization Board

DOI: <http://dx.doi.org/10.21801/ppcrj.2020.63.4>

INTRODUCTION

With the advancement of the incorporation of evidence-based medicine in medical practices and the significant increase of everyday published literature on different

practices, it has become more critical than ever for medical professionals to keep up to date with their professional knowledge (Filho et al., 1999). It is especially crucial for Family Medicine physicians and those who work in primary care to update current

medical practices for appropriate therapeutic and referencing management (Al-Baghli et al., 2015). Studies convey that adequate and high-quality Family Medicine improves health outcomes and reduces the harms of income imbalances. However, the hectic schedule of medical professionals, including Family Medicine physicians, prevents them from having the time to actively read and retain all of this information (De Maeseneer, 2010). Therefore, medical professionals can resort to programs of continuing medical education (CME) and continuing professional development (CPD) to keep their skills and knowledge updated for the improvement of their medical practice (Goulet et al., 2013).

Continuing medical education is defined as a series of educational programs beyond the academic medical curriculum, which focuses on updating medical knowledge. These programs preserve, boost, or raise the ability, skillfulness, and professional performance and relationships that physicians use to supply services to all patients (Goulet et al., 2013). CME includes all learning, teaching, and training activities outside academic qualification. It requires ensuring that physicians have ongoing activities to gain, preserve, and strengthen skills, attitude, and practice in any medical area. Nonetheless, medical professionals have to keep up with the advancing medical knowledge; they also have to master new skills that come up with the advancement of technology (Lindsay et al., 2016; du Boulay, 2000).

For this reason, the concept of CME programs has evolved to continuing professional development (CPD) programs. Continuing professional development encompasses updating knowledge and medical skills in one program (du Boulay, 2000). They are the central part of the requirements for recertification, earning, and renovation of a medical practitioner license in several countries (ACCME, 2006). However, given the constant advancement in technology and productivity, currently, there are requests from medical professionals to renovate the CME system into a multimedia, blended learning experience (Lindsay et al., 2016).

The Family Medicine specialty is emerging globally and is relatively new, having initially been defined as a specialty in 1969 (Bailey, 2007). In Sudan, the first Family Medicine master's degree program was first established in 2006. Currently, five institutions offer graduate programs focusing on Family Medicine in the country. Given the specialty's recentness, there is still a lack of accordance with the role and knowledge that family physicians have to uphold in Sudan's primary

healthcare setting. The lack of a concrete definition of this specialty compromises the continuity of care, and Family Medicine's referral aspects, creating a professional practical gap (Sudan, 2016).

Considering the broad spectrum of knowledge and skills attributed to family physicians, CME and CPD programs are essential for producing these professionals' lifelong knowledge. The most significant gap family physicians face is the barrier between referral processes and diagnostic testing. These obstacles prevent professionals from adequately applying their clinical skills in a primary healthcare setting (Lindsay et al., 2016). Therefore, CME, and especially CPD programs, benefit family physicians by improving the diagnostic knowledge and referral skills of these professionals, bolstering their clinical expertise (Goulet et al., 2013). The literature also conveys that high quality with quantity for CME/CPD has a positive impact with correlation on the clinical practice of Family Medicine (Academy of Royal Medical Colleges, 1999).

Given the constant need for updated methods of promoting CME/CPD programs and the emerging specialty of Family Medicine in Sudan, the purpose of this paper is to propose the development of a blended-learning CPD course. This program aims to recognize the learning needs of Family Medicine physicians in Sudan and bolster their learning experience to better their medical practice in the primary healthcare setting.

METHODS

This is a blended learning CPD proposal for the Sudan Medical Specialization Board. This CPD course is a program geared towards Family Medicine physicians in Sudan.

Practice Gap

Family Medicine physicians often struggle to holistically apply their clinical skills due to not fully understanding their role in referral and diagnostic testing protocols, there is a need for more updated CME/CPD techniques to continue their continuing education (Lindsay et al., 2016). This course aims to improve physicians' critical thinking, decision making, practice modification, and implementation to strengthen the referral system inside primary health care and improve overall patient care in this setting.

Learning materials

Forum Discussion – SLACK:

The forum discussions will be held via the SLACK platform. This platform allows for online interaction via the creation of channels for discussion, file sharing, and teamwork. The SLACK platform allows for video meetings and messaging between colleagues; additionally the physicians can add materials, links, articles, PDFs, posts, diagrams, tables, algorithms, and videos (SLACK Web, 2020).

Readings:

Each week, a different topic within the Family Medicine realm will be assigned. Students will be given an electronic textbook that contains information on the topic in question. They will also be able to search for articles and guidelines that discuss each week's lecture themes and share resources with each other through the SLACK app.

Case studies:

Case studies on the week's topics will be discussed during the face-to-face lecture. Physicians participating in the program will bring real cases from their medical practices to be discussed in a problem-based learning (PBL) format. Physicians will gather in groups and identify the main themes and the steps to be taken according to specific resources (i.e., Family Medicine guidelines and articles).

Course Description

This program will be a longitudinal, 40-week course that will discuss diversified topics about Family Medicine's diagnostic and practical aspects. The program will be divided into four modules, each one consists of ten lectures. These lectures will be selected by the physicians according to their needs, relevance and significance as shown in **Table 1**.

For better retention and improvement of clinical practice, the course will implement a multimedia and blended-learning approach. This includes the requirement of online participation through the SLACK app and weekly face-to-face one-hour lectures to improve the teaching-learning aspects of the course.

Module	Contents
Module 1	The program's activities, the evolution of evidence-based medicine, Family Medicine, clinical research, and ethics. 1 lecture about Orthopedics in the context of Family Medicine 8 lectures in Pediatrics
Module 2	10 lectures in internal medicine
Module 3	6 lectures in Obstetrics and Gynecology 2 lectures about skin diseases

	2 lectures about psychiatric disorders
Module 4	6 lectures in General Surgery 2 lectures about Ear, Nose and Throat diseases 2 lectures in Ophthalmology

Table 1. Number of modules and contents

Several learning/teaching methods will be implemented to encompass a more effective and holistic knowledge-attaining experience. The active/dynamic teaching method will be carried out through the weekly, face-to-face lectures. A delegator/group learning style will be incorporated via the discussions. Problem-based learning will be implemented along with case-study discussions during the lectures, promoting the application of knowledge learned in the course setting to the physicians' clinical practice. All methods integrated into this course are student-centered approaches to focus the CPD on the improvement of physician clinical practice (Shamsan and Syed; 2009).

Each week will consist of a different topic of discussion inside the field of Family Medicine, including but not limited to, family physician guideline updates, new diagnostic testing, and criteria, referral system updates, and protocols. Physicians taking this course will be assigned reading materials regarding each week's topic. The delegator-style learning method will be encouraged through the online forum discussion. This learning technique builds skillfulness and motivates physicians through the duration of the course (Grasha, 1994). These posts and readings are to be completed before the weekly face-to-face lectures to increase discussion quality and knowledge retention.

Lectures

Lectures will be held in small groups of fifteen physicians according to the facilities provided by SMSB to improve student-teacher relationships and bolster communication skills. The lecture's structure will be divided into three different sections: (1) Mini-lecture on clinical/practical recommendations/guidelines, and consolidation of information from nationally recognized governmental agencies and medical associations regarding the week's topic (see **Appendix 2**); (2) Open forum discussion on SLACK (selected discussion posts); and (3) case-study discussions. During the lecture, interactions will be enhanced and motivated; the physicians will add live chats, encourage critical thinking, and engage in class discussion.

The students will be focusing on approaches as per the scope of Family Medicine in Sudan, the United States, Canada, and the United Kingdom. They will learn their limits and pathways when involving secondary and tertiary care and focus on recommendations that meet the local needs in Sudan depending upon the robust and reliable international and local guidelines (see **Appendix 2**).

SLACK posts

Students will have to post five relevant, valid, and reliable posts weekly on the topics. For the posts to be considered valid, they will have to be based on reliable sources. Additionally, students must aim to interact with each other's posts to instigate a discussion about the topic. The posts need to incorporate original ideas that add to the discussion and prompt further thoughts and conclusions. For posts to be considered valid in the discussion, two of them have to be original ideas about the week's subject, two of them have to be in reply to another colleague's ideas and comments, and one of them has to contain information about the topic from a reliable source.

CPD Support

Instructors and coordinators will serve as program facilitators both online and during the weekly live lectures. The program coordinator will play a passive role in promoting interaction, observing, and providing consultation to the physicians participating in the course. The coordinators will also be responsible for the evaluation of student participation during the in-person lecture discussions and the quality of students' SLACK posts.

Learning objectives

1. To consolidate information from nationally recognized governmental agencies and medical associations for the improvement of health care outcomes.
2. To apply the knowledge and skills gained from this course to the physician's medical practice.
3. To understand the role of the Family Medicine physician in the diagnostic and referral stages of the medical consult.

Student assessment

Physicians will be evaluated in a multiple-measure format that will assess the physicians' performance to achieve this course's learning objectives. Assessment

will be comprised of the grading of activities within this program (**Table 2**). At the end of each module students will answer online questionnaires and surveys regarding the contents of the course (i.e., learning materials, training, learning methods), the instructor, the learning environment, and the class in general as to improve the learning process so that the program can be evaluated and modified according to their feedback (**Annexes 1 and 2**). As in **Appendix 1**, the program will measure knowledge, skills, discussion of recommendations/guidelines, consolidation of information from nationally recognized governmental agencies and medical associations and improvement of the health care outcomes. This measurement will be done by assessing the number of new recommendations, guidelines and posts on SLACK.

In order to obtain data, in the end of the educational program, we must somehow measure the outcomes to know that the change is really an improvement. This, counting the numbers of case-based presentation discussed by physicians, performing clinical auditing to know that the healthcare services had really improved at the end of the educational program. Patient satisfaction is an important issue, this can be measured through questionnaires/surveys at the end of the program.

To evaluate the knowledge retention and comprehension of this course, students will also be assigned a post-course assignment. Students will write a report on the recommended Family Medicine guidelines that were addressed during the 40 lectures of this course. Evaluation of this assignment will be included in their overall grade throughout this course.

Activity assessed	Description/criteria needed	Weight
Attendance	Attendance of at least 70% (28 lectures) of the lectures is mandatory for course completion.	30%
Discussion and interaction with colleagues	Students actively participated during topic discussions in all the learning vehicles available during the course (i.e., SLACK Posts during the live lectures	15%
Weekly online participation	Students wrote at least 5 weekly valid and	15%

before the live lectures	reliable posts as follows, 2 posts about the topic, 2 posts adding comments to your colleagues, and 1 post from known reliable resources.	
Implementation of recommended guidelines into practice	Students were able to implement the recommended guidelines as a part of their management plan for at least for 10 patients as documented by electronic health records.	10%
Lecture participation	Students actively participated during the weekly lecture discussions including the case-based discussion and open forum discussion of selected SLACK posts.	20%
Post-course assignment	Students will write a report about the discussed guidelines which will include the pros, cons, strengths, limitations, or weaknesses if available, and compare them to other local/international guidelines	10%

Table 2. Description of the graded activities of this CPD course

Grading will be comprised of the summation of the six components described in **Table 2**, yielding a total of 100%. For students to complete and pass the course, they will need to receive an 85% score or higher. Students will receive a certificate of course completion, a report about their performance and a letter of recommendation for their clinical promotion in Sudan.

DISCUSSION

This blended-learning CPD course encompasses active discussion and learning about the latest Family Medicine guidelines, aiming to improve clinical practice.

It has been proven that a single method of medical teaching and learning has a little impact and is not enough to produce learning, retention, and applicable benefits to students (Dunlosky et al., 2013). Therefore, teaching should encompass multimedia, multiple instructional techniques, and various exposures (Sung; Chang; Liu, 2016). The blended/hybrid learning style combines online educational materials and opportunities for interaction online with traditional place-based classroom methods. It requires the physical presence of both instructors and students. Studies show that this strategy is commonly used in CME/CPD and training settings and how student achievement is superior to single method teaching techniques (Lothridge et al., 2013).

The chosen teaching and learning methods involved in this course bring different and unique benefits for the students participating. The active/dynamic teaching method conveyed in the course's lectures have been depicted as a cheap way of conveying topics to a broad audience; this is because a large amount of information/materials from multiple sources that, clarify complex concepts and model professional practices can be disseminated in a compressed format (Charlton, 2006; Woodring, 2007; Adsit, 2012).

Meanwhile, the delegator/group learning style incorporated into the course's online forum discussions organizes group learning, allows students to work inside the goals, advances communication among gatherings, and answers physicians' inquiries. This method also reviews their progress by playing a passive role in the students' learning procedure to foster a sense of autonomy and responsibility, build trust, evolve new skillfulness and knowledge, increase capabilities, rouse physicians, and accomplish learning destinations to warrant peer criticism (Grasha, 1994).

Incorporating case-study discussions in a PBL format of learning also contributes to better retention and applicability of learned knowledge and clinical skills. It is a self-learning strategy that empowers students to engage in problem-solving and collaborative education. It also improves confidence, knowledge, presentation and communication skills, aptitude, and critical thinking. Students obtain a holistic view of all aspects of a problem through the PBL learning method. The PBL learning system's embodiment is intrinsic in Family Medicine CPDs as it enhances teamwork and interpersonal relationships (Shamsan; Syed, 2009). The building of better interpersonal relationship skills contributes to a better

understanding of the multidisciplinary primary care referral system that the Family Medicine physician is part of (Goulet et al., 2013).

The CME/CPD approach is essential for the progression of lifelong knowledge in a physician's medical practice (du Boulay, 2000). Studies demonstrate that most physicians who take part in CME/CPD programs report knowledge improvement and long-term knowledge retention (Marinopoulos et al., 2007). Nonetheless, current CPD approaches might not fulfill the needs of family physicians as technology and research advances (Lindsay et al., 2016).

To create an adequate CPD program that provides significant opportunities for family physicians, it is critical to identify the current learning gaps and needs of Family Medicine professionals and build a syllabus around those needs (Lindsay et al., 2016). The discussion format of personal-case studies and the physician's application of their acquired knowledge to their patients' management plan allows for lectures to be shaped to the physician's learning needs. This student-centered approach of a CPD program might change the CME/CPD scenery of family physicians in Sudan which is still under consolidation (Sudan, 2011). In 2011, the Sudanese Continuing Professional Development Directorate (CPDD) established the guidelines and policies for CPD programs in Sudan. From then on, continued professional development programs had a framework for enhancing the continuing education profile in the country. The recent development of the CPD policies further justifies the need for more CMEs/CPDs planned under the four-stage cycle CPD outline of the CPDD (Sudan, 2011).

The four-stage cycle is comprised of the following stages: reflect, plan, act, and evaluate. The reflect stage involves the identification of the learning gaps and needs of physicians. The plan stage should include the learning goals, desired achievements, and the outline to achieve the specific goal behind the physician's reasoning for taking the course (Sudan 2011). These stages are actively represented in this course by the personalized discussions and identification of learning needs. Each stage is adequately depicted in this course via the student-centered aspects of this CPD. The CPDD encourages the act stage to encompass various teaching methods for better retention, something portrayed by the blended-learning approach of this course. Finally, the evaluation stage recommended by the CPDD policies is consolidated on an ad hoc basis. It requires the evaluation of training, congruency of course aspects and learning objectives, and knowledge applicability, all

of which are addressed in the assessment of the physicians participating in this course (Sudan, 2011).

Putting a CPD program into practice is a challenging task. The main challenges faced within the development of CMEs/CPDs are the condensation of current knowledge into short academic courses, the sustainability, and adaptability of the planned course and its contents, and the attractiveness of the course based on physicians' practice gaps (Gillam et al., 2009; Wentz et al., 2003). The longitudinal aspect of this course and its inclusion of the physician's personalized experiences into lecture discussions address these challenges and allow for simple knowledge dissemination and applicability.

Although implementing a CME/CPD program is challenging, this course focuses on simple, student-centered approaches to implement recommended guideline practices and improve health care outcomes of family physicians in Sudan. A quixotic system of continuing education is an established method that can support lifelong learning and guarantees that a clinician's knowledge, psychomotor skills, accomplishments, and clinical outcomes are up to date to safe medical practice. The blended-learning approach of this CPD focuses on improving health care outcomes by encompassing the criteria of the quixotic CME/CPD by creating a multimedia learning experience to make the current theoretical recommendations and guidelines in Family Medicine applicable and long-lasting.

Acknowledgments

I sincerely acknowledge the co-author: Sara Elsheikh Ahmedana, all the colleagues who have either supported or participated with me in completing the MLTI 2019. The fantastic group2-Descartes. A special thanks to the MLTI team; all teaching assistants and particularly Mohamed Hashim and the coordinator, Carolina Gomez; and finally the course director Prof. Felipe Fregni for his extraordinary idea for creating an amazing course for the future of teaching and learning.

Conflict of interest and financial disclosure

The authors declare no personal or financial conflicts of interest. We agree with the submission of this manuscript and declare that we have approved it.

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