Original Article

Effect of continuous professional development course of Family Medicine Essentials on Physician's knowledge, skills, and attitude among primary healthcare physicians in Saudi Arabia

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ABSTRACT

Objective: This study was designed to measure the outcome of the continuous professional development (CPD) course (Family Medicine Essentials) conducted and organised by the Ministry of Health (MOH) on the knowledge, skills, and attitude of primary healthcare (PHC) physicians in patient care.

Materials and Methods: This study was based on pre- and post-implementation of training evaluation, which included the seven CPD modules in family medicine customised for non-certified family physicians working at MOH and PHCs in Saudi Arabia. The study was conducted from March 2009 to 2010 and it included 259 family physicians working in PHCs and MOH. The pre- and post-test scores for mean knowledge, skills and attitude were compared using paired *t*-test. $P < 0.05$ was considered significant.

Results: The results showed that the percentage of male participants (80.3%) was higher than females (19.7%). The mean age of the participants was 39.6 ± 8.0 years. A significant difference was found in pre- and post-test scores of PHC physicians' attitude, knowledge and skills. Attitude increased from 77.5 ± 6.1 to 83.0 ± 7.8 ($P < 0.0001$), knowledge increased from 51.3 ± 14.8 to 66.7 ± 14.3 ($P < 0.0001$) while skills increased from 41.2 ± 20.1 to 66.9 ± 19.1 ($P < 0.0001$).

Conclusion: Participants in the CPD course showed significant improvement in their level of knowledge, clinical skills and attitude in patient care. However, further case-control studies and practice evaluations are required to obtain more in-depth information on the impact of this course on PHC physicians.

Keywords: Education, family medicine, Family Medicine Essentials, primary health care centres, Saudi Arabia, training

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INTRODUCTION

Family physicians' (FPs) non-standardised practice may lead to patients' inadequate adherence to management plan, in turn, contributing to the community's poor health status. The initiation of Family Medicine Essential (FAME) programme was an intuitive step to meet the demands of Saudi Arabia's healthcare system and develop more skillful health teams.[1] The FAME programme was established in 2007 with the first training programme designed and implemented as a pilot programme in Riyadh. Subsequently, the project was evaluated, recognised and supported by the Ministry

of Health (MOH). The MOH decided to convert it to a systematic national training and continuous professional development (CPD) programme[2] in order to strengthen FPs working at primary healthcare centres (PHCs).[3] The main aim of the programme was to educate FPs with theoretical as well as practical knowledge that are mandatory for qualified FPs to practice safely. This enabled FPs to administer good quality of care and support with lifelong learning tools, in order to update and professionally develop themselves.[3] The programme consisted of extensive training courses divided into seven integrated modules [Figure 1]. It focuses on the main concepts of family medicine and on how to manage the most common problems encountered in daily practice. It also focuses on the skills and competencies that FPs should capture regarding giving comprehensive and continuous care for individuals and families.[4]

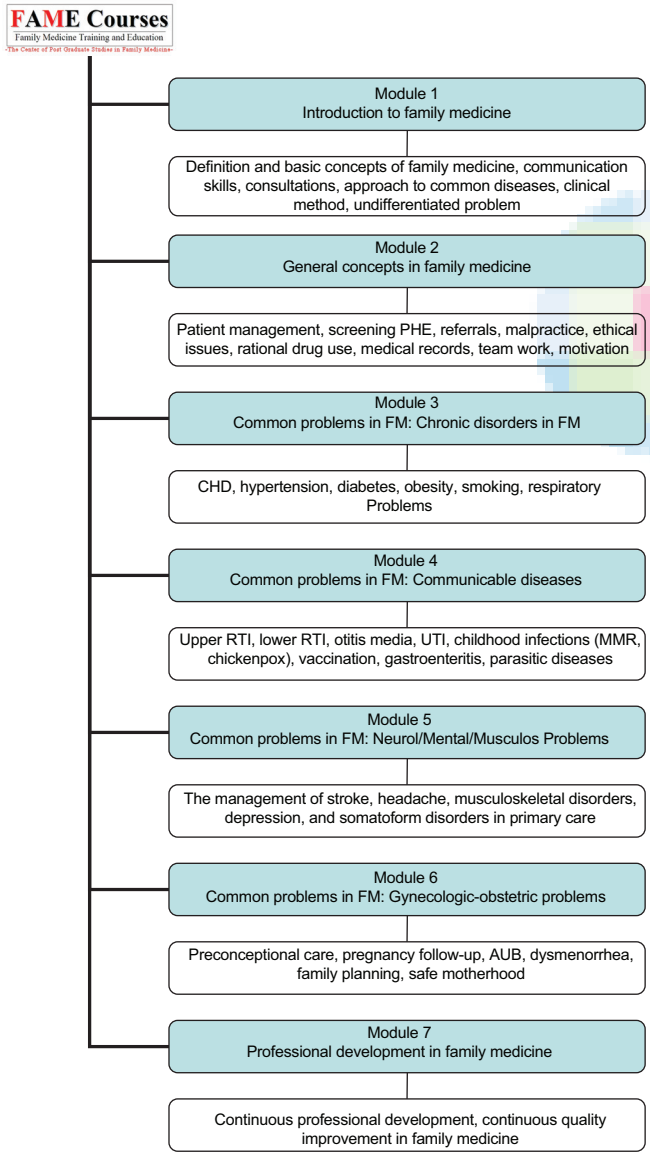

Figure 1: Seven modules of Family Medicine Essential

The objective was to cover all FPs working in PHCs in the Kingdom of Saudi Arabia (KSA) in the past few years.[3] In order to accomplish this goal, the first selected group of trainers invited other trainers from different areas of KSA in order to establish and expand the programme to every region of the Kingdom.

Evaluating the efficacy of any established training programme needs careful planning.[5,6] All the following factors need to be carefully considered when planning and implementing an effective training programme, such as: Defining needs, setting objectives, including relevant content, selecting participants, determining the best schedule, choosing appropriate facilities, selecting appropriate instructors, selecting and preparing audio-visual aid in addition to coordinating the programme.[6,7] Therefore, this study aimed to investigate the outcome of FAME courses by studying the effects on knowledge, skills and attitude of physicians attending these modules.

MATERIALS AND METHODS

It was an interventional single-experimental group study based on pre- and post-implementation assessment conducted during a 1-year period from March 2009 to 2010. Physicians in PHCs from selected regions (Al-Ahsa, Tabouk, Jazan, Al-Baha and Aseer) of Saudi Arabia were included in the study. Physicians were divided on an average of two to four groups in each sector and distributed as two groups each time to take up modules. The regional office selected two trainers to run the modules in order to avoid disruption of work at the PHCs. The regional office also selected the participants. All the physicians were contacted by the sector administrators to attend the modules. Unfortunately, a control group was not included due to limited time and resources.

The data collection tool was developed by an expert panel using Delphi technique which included:

- Personal information such as: Name, gender, age, place of work, qualification, speciality and professional title, place of graduation, year of graduation, nationality and average number of patients seen per day.
- Likert scale was used to assess the physicians' attitude, before and after implementation of the modules, which concentrated on the attitude of physicians towards patient center approach, autonomy of patient, relation of physicians towards health team, colleagues, decision making, responsibility, communication skills, teamwork, applying quality, audit, and their point of view regarding their roles, contribution and competencies.

- Knowledge about family medicine approaches (23 multiple choice questions).
- Seven questions related to skills in electrocardiogram, chest X-ray interpretation, skin rash slides and acute inflammatory bulging eardrum.

Overall, the questionnaire assessed deep learning[2,4] and application of family medicine concepts.

Intervention

After the pre-implementation assessment, the FAME course was applied as an intervention. The course comprised seven modules [Figure 1] with each module completed in 3 days (7 h per day). The module was designed to teach family medicine concepts, communication skills, approach to common problems faced by FPs, professional development and evidence-based medicine.[3] The whole training was standardised by an experienced and trained family medicine consultant who attended a 2-day extensive course, "training of trainers".

The concept of the course was largely based on the principles of adult learning in a non-threatening respectful environment.[5] The planning for the course started by assessing the level of their need and knowledge of clinical practice regarding common diseases of Saudi Arabia. The programme highlighted the necessary skills required for efficient FPs. It focused on management and professional development.

The main outcomes measured were the amelioration on knowledge, skills and attitude that were administered post-implementation of the seventh module. The weighing score in the three domains and the contents were the same in both pre- and post-test. Feedback was given after finishing the last post-test. Internal consistency of the questionnaire was evaluated by using Cronbach's alpha.[8]

Individual scoring of physicians' knowledge, skills and attitude was carried out as follows: Each true answer was given a score of '1', namely: Knowledge, skills and attitude. The total knowledge and skills score was 23 and 8 respectively. While assessing, if more than 2 answers were chosen for MCQs, it was considered as 'don't know' and consequently no mark was given.

A 5-point Likert rating scale (ranging from strongly agree "5" to strongly disagree "1" and I fully disagree "1" to I fully agree "5") was used to measure physicians' attitude regarding communication skills towards colleagues, patient, health team, and their attitude regarding quality, decision making, problem solving, professional development, contribution and accomplishment of their goals, (total score =115). In order to interpret the results; the skills, knowledge and attitude scores were converted to percentages.

The total knowledge and skills score of <50% was considered as unsatisfactory, 50 – 59% was rated as average, 60 – 79% as good, 80 – 89% as very good and >90% as excellent. Whereas for attitude <20% was ranked as 'fully disagree with family medicine approach', 21 – 40% as 'disagree', 41 – 60% 'indifferent', 61 – 80% as 'agree', and >80% as 'fully agree'.

Data processing and analysis

Before coding, all the variables were checked for accuracy and completeness. Data was entered into a computer and the Statistical Package for Social Science (SPSS version 20) was used for analysis. The data scores were recorded, and the totals were obtained for each score. Frequency distribution tables were also constructed. Student's *t*-test was applied to assess the relation between the knowledge, skills and attitude scores in regard to gender and nationality. One-way ANOVA was performed for comparison of knowledge, skills and attitude scores with qualification, specialties, professional title, place of work and place of graduation. The mean of knowledge, skills, and attitude scores for pre- and post-test were compared using paired *t*-test. The correlation coefficient was computed to find the relation between knowledge, skill and attitude scores in relation to age and duration of graduation. Also, it was also used to study the post-test relation between attitude and knowledge and skills score. $P < 0.05$ was considered significant throughout the study.

RESULTS

Demographic related characteristics

The total number of forms collected in pre- and post-test were 259, of which 77 (29.7%) were from Al Ahsa, 40 (15.4%) from Baha, 32 (12.4%) from Jazan and 110 (42.5%) from Aseer. The overall Cronbach's alpha coefficient of the questions regarding knowledge, skills and attitude was 0.854 in all subscales, which shows high reliability. The percentage of the male participants (80.3%) was more than females (19.7%). The mean age of the participants was 39.6 ± 8.0 years. Most of the participants were non-Saudi, i.e., 214 (82.6%) as mentioned in Table 1. The mean number of years since graduation was 12.7 ± 8.0 years. The mean number of patients seen by physicians per day was 49.5 ± 26.5.

As far as the physicians' qualifications were concerned, most of them were holding only a bachelor's degree and were enrolled in residency programmes [Table 1] with no significant difference in the demographic characteristics

between Saudi and non-Saudi. In relation to the place of graduation, almost one-third graduated from Egypt, and one-fifth from Sudan. A significant difference was found in pre- and post-test results; attitude increased from 77.5 ± 6.1 to 83.0 ± 7.8 ($P < 0.0001$), knowledge from 51.3 ± 14.8 to 66.7 ± 14.3 ($P < 0.0001$) and skills from 41.2 ± 20.1 to 66.9 ± 19.1, ($P < 0.0001$) as shown in Table 2.

The association between the knowledge score and independent variables

There was no relation between any mean scores of attitude regarding the nationality; however, Saudis got higher scores in the pre-test of knowledge and skills. The mean scores of knowledge in Saudi was 55.5 ± 13.2 in comparison to non-Saudi (50.4 ± 15.0) with a P value of 0.024. Regarding skills, the mean score in Saudi population was 46.9 ± 18.9 whereas in non-Saudi, the score was 39.8 ± 20.1 with a P value of 0.029. Similarly, there was no statistical difference after applying post-test.

There was no significant difference found among different specialties, titles, gender and age groups. However, there was a proportional relation of number of years of graduation and pre-test knowledge scale ($P = 0.016$), and the disproportional relationship between the total score and post-test of knowledge scores. The results were also significant in terms of the total number of patients seen in clinics ($P = 0.003$ and $P = 0.005$) in pre- and post-test respectively.

Regarding place of work, the higher score for attitude was obtained in Jazan region, i.e., 85.1 ± 7.3 ($P = 0.02$), and higher scores for knowledge and skills was obtained from Aseer to Al-Ahsa, ($P < 0.0001$ and 0.005) respectively. The relation between total knowledge, skills and attitude scores using Pearson correlation was found to have proportional relationship between knowledge and skills in post-test and attitude ($P < 0.0001$, and $P = 0.005$) respectively. The distribution of the scores according to the region, as illustrated in Tables 3 and 4, was found to have significant improvement in all subscales.

Table 1: Characteristics of the participant group

Variables	Number of participants (%)
Gender	
Men	208 (80.3)
Women	51 (19.7)
Mean age ± SD	39.6 ± 8.0
Ratio of Saudi and Non-Saudi Doctors	
Saudi	45 (17.4)
Non-Saudi	214 (82.6)
Qualification	
Bachelor	242 (93.4)
Master	13 (5.0)
Fellowship	2 (0.8)
PhD	2 (0.8)
Place of work	
Al-Ahsa	77 (29.7)
Al-Baha	40 (15.4)
Jazan	32 (12.4)
Aseer	110 (42.5)
Title	
Residents	249 (96.1)
Specialist	10 (3.9)
Specialty	
General Practitioners	232 (89.5)
Family Medicine (Diploma)	3 (1.2)
Internist	4 (1.6)
Obstetrics and gynaecology	4 (1.6)
Paediatric	6 (2.3)
Others	10 (3.9)

SD: Standard deviation

Table 2: Score results of the pre- and post-test

Variables	Pre-test ± SD	Post-test ± SD	P
Mean score of attitude	77.5 ± 6.1	83.0 ± 7.8	<0.0001
Mean score of knowledge	51.3 ± 14.8	66.7 ± 14.3	<0.0001
Mean score of skills	41.2 ± 20.1	66.9 ± 19.1	<0.0001

SD: Standard deviation

DISCUSSION

To the best of our knowledge, so far, no such national training programme[3] has been implemented under the umbrella of MOH, and this is the very first study done to evaluate such a training programme after its implementation in 2007. The results have shown significant change in knowledge, clinical skills and attitude of general practitioners (GPs) that demonstrated a promising outcome of the FAME course.

The CPD training programme has been recognised as an important component of most of the services for further development and improvement in every part of the world. However, in the medical field, training and eventfully its impact are still in debate.[9] Nevertheless, with the rapidly expanding medical information,[10] a major challenge for the medical education community is educating doctors and updating physicians on the optimal approaches for diagnosing and managing the clinical conditions they will encounter once they are in actual practice, especially with the overwhelming explosion of information.[11]

The choice of the measurement method is a crucial step in the evaluation of educational interventions because many evaluation methods are not sensitive enough to measure the effectiveness of the interventions, which could lead to incorrect interpretation of results.[10] İn

Table 3: Distribution of the participant physician's scores

Variable	Pre-test	Post-test	*P*
Attitude			
Neutral	1 (0.4)		<0.0001
Positive	182 (70.3)	85 (32.8)	
Strongly positive	76 (29.3)	174 (67.2)	
Skills			
Unsatisfactory	143 (55.2)	34 (13.1)	
Average	54 (20.8)	27 (10.4)	
Good	55 (21.2)	134 (51.7)	
Very good	6 (2.3)	54 (20.8)	
Excellent	1 (0.4)	10 (3.9)	
Knowledge			
Unsatisfactory	112 (43.2)	32 (12.4)	
Average	68 (26.3)	39 (15.1)	
Good	75 (29.0)	145 (56.0)	
Very good	4 (1.5)	36 (13.9)	
Excellent	0 (0.0)	7 (2.7)	

Table 4: Distribution of the skills according to the region

Region	Variables	Pre-test	Post-test	*P*
Al-Ahsa	Mean score of attitude	77.5 ± 5.8	83.0 ± 8.1	<0.0001
	Mean score of knowledge	52.4 ± 13.8	64.9 ± 12.4	<0.0001
	Mean score of skills	45.9 ± 20.5	65.7 ± 16.4	<0.0001
Al-Baha	Mean score of attitude	76.0 ± 6.2	79.9 ± 6.8	<0.002
	Mean score of knowledge	47.9 ± 12.6	61.4 ± 17.3	<0.0001
	Mean score of skills	39.1 ± 19.4	61.3 ± 16.5	<0.0001
Jazan	Mean score of attitude	77.5 ± 5.0	85.1 ± 7.3	<0.0001
	Mean score of knowledge	48.8 ± 14.1	61.7 ± 15.1	<0.0001
	Mean score of skills	30.1 ± 22.6	61.3 ± 21.1	<0.0001
Aseer	Mean score of attitude	78.1 ± 6.4	83.6 ± 8.0	<0.0001
	Mean score of knowledge	52.6 ± 16.2	71.4 ± 13.0	<0.0001
	Mean score of skills	41.8 ± 18.0	71.5 ± 20.1	<0.0001

this evaluation, the utilization of a highly reliable questionnaire ($\alpha = 0.854$) and blueprint give a high standard of content validity of the study, in addition to face validity.

As a matter of fact, the level of baseline knowledge and skills of the physicians was low, and it was noticed that there was slow progression in imparting the knowledge. Almost half of the physicians had unsatisfactory skill and knowledge, which impeded the achievement of quality primary care in Saudi Arabia.

The results indicate that the FAME modules improved a physician's total knowledge and skills to family medicine approaches. Despite the complexity and the cautions, one should bear in mind interpreting the impact of any training activity.[6,7,11] This FAME-course introduced to the physicians the essential concepts in family medicine, with greater emphasis on the application by enhancing their skills and developing a positive attitude towards a holistic approach.

It was revealed from the results that participants had a positive opinion about autonomy of patients, communication with colleagues, health team, quality improvement and they also felt that CPD trainings may enhance positive attitude further. Lack of knowledge and training may be cited as somewhat of a barrier[12] to understand patient center approaches and the principles of quality and audit, and this course built an essential foundation to understand those technical terms and also taught them how to overcome these barriers in their practice. A similar effect has been measured in a study done by Qureshi *et al*.,[13] which showed that the special training of GPs in management of hypertension and emphasising good communication between doctors and patients is more effective than the usual care provided in the communities.

The definitive effect of formal continuing medical education (CME) interventions on the practice of physicians and the health of their patients (as in the case of any intervention) must be understood in the context of the methods by which the CME is delivered, resources available, the environment in which the translated competence is played out and in the complex intrapersonal, interpersonal and professional educational variables that affect the physician's own learning style.[4,14,15]

Whitcomb[16] stated, "It is crucial that the academic medicine community and the leaders of professional organisations develop a sense of urgency about making the kind of changes needed in the ways doctors are educated. Those holding leadership positions in medical schools and teaching hospitals must find ways to meaningfully incorporate clinical question exercises into their institutions' education programmes. At the same time, the policies and practices of professional organizations must be changed to recognise that conducting clinical question exercises in practice settings is the best kind of CME doctors can participate in."

We conclude that the performance change was the immediate goal of the course. It is unlikely that improvements in the score of these physicians were due to confounding factors of their qualifications, experiences or prior training other than this FAME training programme, because of the large magnitude of improvements in the scores that could only be possible without having current knowledge.

Implications of the study

The results depict significant improvement in physicians' knowledge, clinical skills and attitude. The short-term benefits included increase in knowledge, development of positive attitude towards family medicine and enhanced skills, which eventually give benefits to the patients. Whereas, long-term benefits would be

measured in terms of greater effects like controlling diseases that were covered during the programme and these benefits would be sustainable in future if CPD courses are implemented on a regular bases. Therefore, this CPD course is strongly recommended at the national level for health improvement.

Limitations of the study

Although results were significant, there are some limitations in the study. For example, whenever a pre-test is given, it tends to have an effect on the post-test results. This is due to the fact that when trainees take the post-test, they are likely to remember some of the questions and some of the errors made at the pre-test; and therefore, likely to do somewhat better on the post-test than on the pre-test. Better performance on the post-test might have nothing to do with the training; it might be due to the practice gained on the pre-test. So we can conclude that the pre-test might have a very less effect on the post-test due to the extensive time duration between their implemenations, which was almost 1-year. This study is not enough to generalise the results; further case-control studies and in-practice evaluation would be required to assess the correct impact of the training programme.

REFERENCES

1. Albar AA. Twenty years of family medicine education in Saudi Arabia. East Mediterr Health J 1999;5:589-96.
2. Hilliard RI. Teaching and learning in medicine. Int J 1995;7:201-10.
3. Megbil T, Khan AS, Akurk Z, Twijri AM, Khudair B. FAME (Family Medicine Essentials): An effort to put clinical practice guidelines into practice in Saudi Arabia. Middle East J Fam Med 2012;10:13-20.
4. Newble DI, Hejka EJ, Whelan G. The approaches to learning of specialist physicians. Med Educ 1990;24:101-9.
5. Khan AS, Akturk Z, Al-Megbil T. Evaluation of the learning environment for diploma in family medicine with the Dundee Ready Education Environment (DREEM) Inventory. J Educ Eval Health Prof 2010;7:2.
6. Kirkpatrick DL, Kirkpatrick JD. Evaluating Training Programs; 2009. Available from: http://www.bkconnection.com/static/Evaluating_Training_Programs_EXCERPT.pdf. [Last accessed on 2013 Apr 10].
7. Shek DT, Wu FK. Quantitative evaluation of the revised training program Project P.A.T.H.S. in Hong Kong. Int J Adolesc Med Health 2012;24:267-72.
8. Reynaldo J, Santos A. Cronbach's alpha: A tool for assessing the reliability of scales. J Ext 1999;37.
9. Davis D, O'Brien MAT, Nick F. Impact of formal continuing medical education. JAMA 1999;282:867-74.
10. Mazmanian PE, Harrison RV, Osborne CE. Diversity across medical schools: Programs, enrollment, and fees for continuing medical education. J Contin Educ Health Prof 1990;10:23-33.
11. O'Neil KM, Doreen J. Continuing medical education: American psychomotor skills: Effectiveness of physician knowledge application and continuing. Chest 2009;135:37S-41S.
12. Reed D, Price EG, Windish DM, Wright SM, Gozu A, Hsu EB, *et al.* Challenges in systematic reviews of educational intervention studies. Ann Intern Med 2005;142:1080-9.
13. Qureshi NN, Hatcher J, Chaturvedi N, Jafar TH, Hypertension Research Group. Effect of general practitioner education on adherence to antihypertensive drugs: Cluster randomised controlled trial. BMJ 2007;335:1030.
14. Gravel K, Légaré F, Graham ID. Barriers and facilitators to implementing shared decision-making in clinical practice: A systematic review of health professionals' perceptions. Implement Sci 2006;1:16.
15. Goodman MS, Si X, Stafford JD, Obasohan A, Mchunguzi C. Quantitative assessment of participant knowledge and evaluation of participant satisfaction in the CARES training program. Prog Community Health Partnersh 2012;6:361-8.
16. Whitcomb ME. Why we must teach evidence-based medicine. Acad Med 2005;80:1-2.

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