

Continuing Medical Education among resident physicians in Abha , Saudi Arabia : Current Practice and Existing Gaps

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Research article

Keywords: Continuing Medical Education; Resident physicians; Abha; southwestern Saudi Arabia.

Posted Date: July 2nd, 2020

DOI: <https://doi.org/10.21203/rs.2.18686/v3>

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Abstract

Background: Continuing Medical Education (CME) is concerned with the maintenance, improvement, and promotion of the health care and exhausts the physicians' working life-span. Although international research is extensive, only a dearth of studies exists in Saudi Arabia and the Middle East. This study aims to explore CME practices of resident physicians in Abha City, south western Saudi Arabia and the existing gaps.

Method: A cross-sectional questionnaire-based descriptive study conducted on residents training in various health-care facilities in Abha city.

Results: Three-hundred resident physicians participated in the study (response rate of 75%). Out of them 79.7% (239) reported attending lectures and seminars for their CME needs followed by those who attended case presentations 39.7% (119). Electronic CMEs were used by a minority of residents (n = 24, 8%), and only 27.3% (n = 82,) attended journal clubs. Being busy was the main barrier against self-reading as reported by 70.7% (212) of participants, and by 51.7 % (155) for lectures and seminars, and 41.3% (124) for attending courses. There were no significant differences in satisfaction with CME activities by gender, nationality and training level (p = 0.982, 0.924, and 0.540, respectively). Satisfaction scores with CME activities were variable across different specialties (p = 0.039). The lowest satisfaction scores were among psychiatry residents and the highest was among the restorative dentistry and surgery residents. Workshops and courses were significantly perceived by residents as the most effective method in retention of knowledge, improving attitudes, improving clinical skills, improving managerial skills, and in proving practice behaviors. On the other hand, inter-departmental activities were significantly perceived by residents as most effective in improving academic skills and improving departmental image.

Conclusion: The participant physicians favoured contact CME activities. In consistence with global research findings, being busy was the main barrier against CME goals attainment. Participants affirmed that CME activities improved their clinical practice, clinical skills and academic skills. Promotion of online learning in Saudi Arabia. Support of residents with protected time for their CME activities. Encouragement of trainees into further advice about their preference in terms of CME forms to help boost their engagement.

Background

Medical practitioners need to continuously update the knowledge in their specific fields to keep up with the proliferating medical knowledge and dynamic treatment technology [1]. Almost sixty years ago, the first conference on medical education held by the College of General Practice of Canada in Toronto in the fall of 1962 produced the following consensus: "Continuing Medical Education is an essential feature of the practice of modern medicine, as it maintains the doctor's ability to provide quality patient-care. This concept of 'life-long learning' must be actively developed in the under-graduate medical student and

sustained in the graduate doctor, both practitioner and teacher". This early introduction of the topic is still valid up till now.[2]

Medical professionals continuing their training throughout their careers is termed "Continuing Medical Education" (CME). Formal CME includes organized activities such as conferences, workshops, symposia, courses, and educational meetings. Personal efforts such as frequent/habitual reading and inquiries that help a person to remain up to date in his/her professional development are also included [3].

Although formal CME may be a recent phenomenon, the concept of continuing medical education is not new. Health professionals have been involved in some form of CME since the early twentieth century [4]. Currently, continuing medical education (CME) is shifting from a traditional passive model to a competency-based, self-directed learning model [5].

Continuing Medical Education (CME) is unending and lasts throughout the physician's working life. The primary purpose of continuing medical education is for professionals to remain up to date with the latest knowledge in their profession so as to facilitate competent practice and improve their patient care [4]. Continuing medical education helps to improve not only their knowledge and skills but also to build relationships that a physician may use to provide services for patients [6].

Without active learning, physicians are unable to remain competent for more than a few years after graduation. A review of recertification examination in the US reported that examinees who had been trained long before were less successful in the examination than those who were recently trained [7]. For physicians to stay fit to practice, it is thus a core professional responsibility if not an ethical and moral obligation to continue to learn throughout their career regardless of discipline, specialty, or type [8].

In 1995 a systematic review of the effect of continuing medical education strategies [9] including ninety-nine studies, evaluating 160 separate interventions (apart from placebo or non-intervention controls), concluded that physician performance may be altered by many educational interventions and, to a lesser extent, so may health care outcomes. Widely-used continuing medical education delivery methods, such as conferences, have little direct impact on improving professional practice. More effective methods such as systematic practice-based interventions and outreach visits are seldom used by continuing medical education providers.

There are diverse opinions as regards continuing medical education; elicited by research in different countries and different population groups. A research from Australia focused on GPs, physicians and surgeons. It reported that modern, technology-dependent forms of CME were less common but were believed by respondents to be the best mode of delivery. The studied groups showed difference in attitudes, with physicians finding CME more enjoyable than GPs [10]. Another study on users of British Medical Journals online CME reported that younger and more recently qualified doctors choose online CME, and their choice appears to be unrelated to workload and personal pressures [11]. The consistent finding across studies from UK, Australia and South Africa is that traditional CME activities such as

lectures, conferences and journal reading remain the most popular forms of CME used and all doctors found lack of time a barrier to CME activities. [10-12].

There are many issues facing health-related human resource development in the Kingdom of Saudi Arabia, and continuing medical education is not spared from these challenges. CME involves many actors such as providers, sponsors, participants, and regulators. Several challenges have been identified including a lack of transparency in the CME budget, which leads to a too close relationship between the pharmaceutical industry and physicians, as well as issues of coordination between providers, adequate assessment of needs and resources, effectiveness, and quality control [13].

In Saudi Arabia, the Saudi Commission for health specialties (SCFHS) is running different Postgraduate Programs for training of graduates in different health specialties. By the end of the training and passing the assessment modalities the candidate will get the Saudi Board certificate which is the highest professional certificate in general specialties awarded by the Commission. Each program will run for five years. Similarly, the SCFHS is running CME which is defined as educational activities, which aim to keep health practitioners abreast with the latest developments in their specialties and related fields.

In Saudi Arabia, the regulatory body that approves and accredits all CMEs, the Saudi Commission for Health Specialties (SCFHS), has ruled that all healthcare practitioners must acquire a set number of CME hours minimum 30 hours annually for successful licensing to practice as physician in the Kingdom. Resident physicians in different SCFHS post graduate training programs are exempted from CME activities for finalizing their training in the due programs. Yet, they need attending minimal CME hours to be licensed for their practice. Saudi candidates getting their postgraduate training outside the Kingdom are also required to have CME hours before licensing to practice in Saudi Arabia. CME activities are given to practicing physicians (residents, specialists and consultants) [3]

Essentially, this regulation presumes that attending CME events secures the improvement of attendees' knowledge and skills [3]. However, this regulatory approach is not sufficient to ensure effective learning. There is a need to give proper attention to principles of adult learning to enable learners to be active participants in developing training programs. It is also necessary to fashion the learning activities according to learners' goals [14]. In Saudi Arabia, there have been no substantial reports on such aspects of CME [3].

Previously, the related studies have focused on quality issues in CME rather than the needs assessment of physicians who are the major stakeholders [15, 16]. A key study has described the development, implementation, and evaluation of an educational program in family medicine for general practitioners in Saudi Arabia that trained about 20% of all GPs showed very promising results with significant improvement of knowledge [17]. However, there is dearth of information on the CME needs of the participants.

Up to the researcher's knowledge, no similar study has been conducted in Abha City, southwestern Saudi Arabia during the past decade to explore the needs and practices among resident physicians regarding

their continuing education or to clarify trainees' views about different aspects of CME.

Aim of Study:

This study aims to explore CME practices of resident physicians in Abha City and the existing gaps.

Study Objectives

- To identify the current CME practices of resident physicians.
- To explore opinions of resident physicians regarding continuing medical education.

To identify barriers in CME practice among resident physicians.

Methods

Study design:

A cross-sectional survey study was conducted among male and female residents at governmental hospitals (Maternity and Children's Hospital and Aseer Central Hospital) in Abha City in 2018.

Target population and sampling:

With an anticipated proportion of CME training among residents of 50% [3] and an absolute precision of 6% at 95% confidence, the minimal sample size needed for the survey was calculated to be 267 residents [18]. To account for potential nonresponse, an overall sample size of 300 residents was initially planned for the study. A list of residents was obtained that yielded 400 currently enrolled residents from all departments. All residents were invited to participate in the study using an online questionnaire. A total of 313 residents returned filled questionnaires for a response rate of 75%. Thirteen incompletely filled questionnaires were discarded, leaving a final sample of 300 residents.

Survey tool:

This study used a self-administered questionnaire that was constructed by incorporating previous validated questionnaires obtained on request from their authors [3, 19]. Besides the personal characteristics of age, gender, nationality, marital status, specialty, position, qualification, and years of experience, the various aspects of continuing professional education were explored. The aspects of CME that were included were as follows. Current participation in CME activities: frequency of CME activity, type of activity (conference, seminar, self-reading), reasons for doing CME, satisfaction with current CME practices, preferred methods of instruction in different CME activities, and barriers to attending CME. Resident preferences for future CME activities (time of activity, duration, evaluation methods) were also elicited.

We analyzed the total satisfaction score by adding up the ordinal responses of trainees according to the satisfaction score between 0 and 4, where *strongly disagree* = 0 and *strongly agree* = 4. Cronbach's alpha

for the 8 satisfaction questions was 0.85, which indicates very good reliability and internal consistency. Obtaining all the necessary official approvals and research ethical committees prior to conduct the study.

Data collection and analysis:

The study questionnaire was emailed to all residents working in the Asser region. Data were analyzed using the SPSS software package, version 22. Categorical data were summarized using frequencies, percent and presented using tables and bar graphs, while continuous data were summarized using median, range, arithmetic mean, and standard deviation (SD). Ch-square, student "t" test and ANOVA were used as tests of significance. The level of significance was set at $p \leq 0.05$.

Results

The present study included a total of 300 residents. Figure 1 shows the CME activities undertaken by the study participants in the previous year. During this period, 239 (79.7%) of the participants reported attending lectures and seminars for their CME needs. There were 102 who attended workshops (34%), whereas 89 (29.7%) reported attending group discussions and 119 (39.7%) reported attendance at case presentations. Electronic CMEs were used by a minority ($n = 24$, 8%), and only 82 (27.3%) attended journal clubs. There were 131 (43.7%) who attended conferences. Residents usually engage in more than one modality of CME activities.

Table 1 shows that the study included 176 (58.7%) males and 124 (41.3%) females among the participating residents, most of whom were Saudis ($n = 289$, 96.3%). Half of all residents were married. By specialty, 24.3% were residents in family medicine, 21.3% in internal medicine, and 12.7% in pediatrics. Other specialties, namely obstetrics and gynecology, ENT, and dermatology, made up approximately 5%, and orthopedics, preventive medicine, and general surgery about 4% of study participants each. Lower figures were shown for ophthalmology (3.7%), radiology (3.3%), and psychiatry (2%), while emergency medicine, restorative dentistry, and urology each made up less than 2% of the residents. By the level of residency, there were 89 residents (29.7%) in first year (R1); almost equal numbers of R2 and R3, 75 and 74 (25% and 24.7% respectively); 44 (14.7%) R4; and only 7 (2.3%) were R5.

Table 1 shows also the average total satisfaction scores. There were no significant differences between males and females regarding satisfaction with CME activities scores ($p = 0.9816$). Similarly, no significant differences in scores were found by nationality and marital status. Satisfaction scores with CME activities were variable across specialties ($p = 0.039$). The lowest satisfaction scores were among psychiatry residents and the highest was among the restorative dentistry and surgery residents. There were no significant differences in satisfaction scores by training level ($p = 0.54$).

Table 1: Satisfaction score with CME activities among the study residents ($n=300$) by characteristics

| Characteristic | Frequency | Percentage (%) | Satisfaction score Mean \pm SD | P-value |
|----------------------------|-----------|----------------|-------------------------------------|--------------------|
| Gender | | | | |
| Males | 176 | 58.7% | 21.017 \pm 5.310 | 0.9816 $^{\alpha}$ |
| Females | 124 | 41.3% | 21.032 \pm 5.847 | |
| Marital Status | | | | |
| Married | 151 | 50.3% | 21.20 \pm 5.44 | 0.5882 $^{\alpha}$ |
| Single | 149 | 49.7% | 20.85 \pm 5.65 | |
| Nationality | | | | |
| Saudi | 289 | 96.3% | 21.017 \pm 5.541 | 0.9236 $^{\alpha}$ |
| Non-Saudi | 11 | 3.7% | 21.182 \pm 5.456 | |
| Training Specialty | | | | |
| Family Medicine | 73 | 24.3% | 21.88 \pm 5.19 | 0.0393 $^{\beta}$ |
| Internal Medicine | 64 | 21.3% | 22.41 \pm 5.35 | |
| Paediatrics | 38 | 12.7% | 19.39 \pm 6.93 | |
| Obstetrics and Gynaecology | 17 | 5.7% | 20.76 \pm 6.09 | |
| ENT | 15 | 5% | 20.07 \pm 4.30 | |
| Dermatology | 14 | 4.7% | 21.29 \pm 5.12 | |
| Orthopaedics | 14 | 4.7% | 21.00 \pm 4.52 | |
| Preventative Medicine | 14 | 4.7% | 19.21 \pm 3.33 | |
| General Surgery | 12 | 4% | 18.83 \pm 6.71 | |
| Ophthalmology | 11 | 3.7% | 19.09 \pm 6.71 | |
| Radiology | 10 | 3.3% | 21.00 \pm 3.62 | |
| Psychiatry | 6 | 2% | 16.00 \pm 5.37 | |
| Emergency Medicine | 4 | 1.3% | 24.50 \pm 4.43 | |
| Restorative Dentistry | 4 | 1.3% | 26.00 \pm 1.83 | |
| Urology | 4 | 1.3% | 20.00 \pm 9.09 | |
| Training Level | | | | |
| R1 | 89 | 29.7% | 20.27 \pm 4.85 | 0.5400 $^{\beta}$ |
| R2 | 75 | 25% | 21.19 \pm 6.72 | |
| R3 | 74 | 24.7% | 21.47 \pm 5.14 | |
| R4 | 44 | 14.7% | 21.82 \pm 5.14 | |
| R5 | 7 | 2.3% | 21.29 \pm 5.59 | |

α “using student t test”

β “using ANOVA”

Table 2 describes the residents’ beliefs about continuous medical education as assessed by their level of agreement with various statements. To the statement, “I believe that my CME needs are currently satisfied,” 42.3% of the residents agreed, compared to 24.3% who disagreed. To the statement, “I believe that my medical school education encouraged me to be an independent self-learner,” 49.4% agreed and 24.3% were neutral. More than two-thirds (68.7%) agreed that “I believe that CME activities should be organized on a national level.” To the statement, “CME activities keep me up-to-date,” a majority (65%) agreed and 8% disagreed. Some (68.7%) agreed that “CME activities help me to improve my practice,” in contrast to 8.3% who disagreed. A majority (65%) agreed with the statement, “CME activities affect my professional confidence,” compared to 26.7% who were neutral. As to the statement “CME activities offer new learning opportunities,” 65.3% agreed and 7.7% disagreed or strongly disagreed, respectively. “CME activities provide sufficient scopes for questions and discussions” was agreed to by 57.7%, while 10.7% disagreed.

Table 2: Resident’s beliefs (n=300) about continuous medical education.

| Statement | Agree N ₀ . (%) | Neutral N ₀ . (%) | Disagree N ₀ . (%) |
|--|-------------------------------|---------------------------------|----------------------------------|
| I believe that my CME needs are currently satisfied | 127 (42.3) | 100 (33.3) | 73 (24.4) |
| I believe that my medical school education encouraged me to be an independent self-learner | 148 (49.4) | 73 (24.3) | 79 (26.3) |
| I believe that CME activities should be organized on a national level | 206 (68.7) | 66 (22.0) | 28 (9.3) |
| CME activities keep me up to date | 195 (65.0) | 81 (27.0) | 24 (8.0) |
| CME activities help me to improve my practice | 203 (68.7) | 72 (24.0) | 25 (8.3) |
| CME activities affect my professional confidence | 195 (65.0) | 80 (26.7) | 25 (8.3) |
| CME activities offer new learning opportunities | 196 (65.3) | 81 (27.0) | 23 (7.7) |
| CME activities provide sufficient scope for questions and discussions | 173 (57.6) | 95 (31.7) | 32 (10.7) |

Table 3 describes the residents’ perceptions of the effectiveness of different CME activities (Conferences/symposia, workshops/ courses, and interdepartmental activities). The table shows that

workshops and courses were significantly most effective compared to the other two methods in retention of knowledge, improving attitudes, improving clinical skills, improving managerial skills, and in proving practice behaviors. On the other hand, inter-departmental activities were significantly most effective compared to the other two methods in improving academic skills and improving departmental image.

Table 3: Residents' perceptions (n=300) of the effectiveness of different CME activities.

| Benefit of CME Activity | CME method analyzed for effectiveness | | | | | | | | | P ^α |
|--------------------------------|---|---------------|---------------|--|---------------|---------------|--|---------------|---------------|----------------|
| | Conference/Symposia N ₀ . (%) | | | Workshop/courses N ₀ . (%) | | | Inter-Departmental Activities N ₀ . (%) | | | |
| | A | B | C | A | B | C | A | B | C | |
| Retention of knowledge | 47 (15.7) | 144 (48.0) | 109 (36.3) | 37 (12.3) | 111 (37.0) | 152 (50.7) | 43 (14.3) | 124 (41.3) | 133 (44.4) | 0.013 |
| Improving attitude | 55 (18.3) | 132 (44.0) | 113 (37.7) | 36 (12.0) | 117 (39.0) | 147 (49.0) | 40 (13.3) | 116 (38.7) | 144 (48.0) | 0.025 |
| Improving clinical skills | 56 (18.7) | 127 (42.3) | 117 (39.0) | 21 (7.0) | 95 (31.7) | 184 (61.3) | 37 (12.3) | 108 (36.0) | 155 (51.7) | 0.001 |
| Improving clinical outcomes | 42 (14.0) | 117 (39.0) | 141 (47.0) | 28 (9.3) | 101 (33.7) | 171 (57.0) | 32 (10.7) | 110 (36.7) | 158 (52.7) | 0.129 |
| Improving managerial skills | 54 (18.0) | 131 (43.7) | 115 (38.3) | 29 (9.7) | 109 (36.3) | 162 (54.0) | 32 (10.7) | 122 (40.7) | 146 (48.6) | 0.001 |
| Improving academic skills | 56 (18.7) | 103 (34.3) | 141 (47.0) | 35 (11.7) | 101 (33.7) | 164 (53.3) | 30 (10.0) | 106 (35.3) | 164 (54.7) | 0.019 |
| Improving communication skills | 50 (16.7) | 123 (41.0) | 127 (42.3) | 34 (11.3) | 106 (35.3) | 160 (53.4) | 42 (14.0) | 111 (37.0) | 147 (49.0) | 0.055 |
| Improving practice behavior | 50 (16.7) | 123 (41.0) | 127 (42.3) | 30 (10.0) | 100 (33.3) | 170 (56.7) | 39 (13.0) | 115 (38.3) | 146 (48.7) | 0.008 |
| Improving departmental image | 54 (18.0) | 131 (43.7) | 115 (38.3) | 40 (13.3) | 113 (37.7) | 147 (49.0) | 35 (11.7) | 111 (37.0) | 154 (51.3) | 0.012 |

A = Least Effective, B = No Opinion, C = Most Effective

α "using Chi square test"

Table 4 shows participants' preferred methods of instruction in the CME activities during the past one year. The highest frequency of residents preferred that lectures should take place in the form of a conference/symposium (n = 111, 37%). For demonstration-type CME activities, residents preferred that it should take place in workshops (n = 119, 39.7%), while for hands-on practice, most residents preferred that it should take place in workshops (n = 162, 54%). Similarly, for small group CME seminar practice, the highest frequency of residents preferred workshops (n = 108, 36%). However, for live-case-presentation CMEs, residents equally preferred workshops and conferences (n = 88, 29.3%; 89, 29.7%, respectively), while for simulation CMEs, workshops were the preference of 40.7% (123) of the residents. For distance learning CMEs and electronic meeting CMEs, the highest frequency of residents preferred conferences (n = 119, 39.7%; n = 134, 44.7%, respectively).

Table 4: Residents' preferred methods (n=300) of instruction in the CME activities during the past one year

| CME methods | Conference /Symposium | Workshop | Courses | Inter- Departmental Activities |
|-------------------------|--------------------------|------------|-----------|--------------------------------|
| | NQ. (%) | NQ. (%) | NQ. (%) | NQ. (%) |
| Lecturing | 111 (37.0) | 52 (17.3) | 60 (20.0) | 77 (25.7) |
| Demonstration | 97 (32.3) | 119 (39.7) | 60 (20.0) | 24 (8.0) |
| Hands-on practice | 50 (16.7) | 162 (54.0) | 49 (16.3) | 39 (13.0) |
| Small group seminar | 52 (17.4) | 108 (36.0) | 68 (22.6) | 72 (24.0) |
| Live case presentation | 89 (29.7) | 88 (29.3) | 50 (16.7) | 74 (24.7) |
| Simulations | 57 (19.0) | 123 (40.7) | 55 (18.3) | 66 (22.0) |
| Distant learning | 119 (39.7) | 70 (23.3) | 84 (28.0) | 27 (9.0) |
| Electronic conferencing | 134 (44.7) | 53 (17.7) | 82 (27.3) | 31 (10.3) |

Table 5 shows the frequency distribution of respondents by their preferred CME resources, frequency of CME activity, and reasons for using different CME activities and barriers. The most prevalent self-reading method was reading medical books (n = 230, 76.7%), followed by online websites for self-reading (n = 196, 65.3%). One out of each five residents reported reading medical journals, which was lower than the 30.3% who reported using social media for self-reading purposes. When asked how often they read, the highest frequency of residents (n = 128, 42.7%) reported weekly self-reading, compared to 116 (38.7%) who reported daily self-reading. The reasons for using self-reading as a CME method were ease of time

management (n = 208, 69.3%), ease of place (n = 104, 34.7%), price (n = 54, 18%), subject (n = 86, 28.7%), and reputation of provider (n = 13, 4.3%). Barriers to self-reading were reported as being busy (n = 212, 70.7%), lack of interest (n = 31, 10.3%), lack of provision (n = 26, 8.7%), lack of suitability (n = 15, 5%), and high cost (n = 26, 8.7%).

Table 5: Distribution of residents by their preferred CME resources, frequency of CME activity, reasons to use different CME activities and barriers to attending CME

| Variable | Self-Reading N ₀ . (%) | Attending Lectures & Seminars N ₀ . (%) | Attending Courses N ₀ . (%) |
|------------------------|--|---|---|
| CME Resources | Medical books: 230 (76.7%) Medical journals: 63 (21%) Online websites: 196 (65.3%) Social media: 91 (30.3%) | Conferences: 106 (35.3%) Live casts: 74 (24.7%) Presentations: 195 (65.0%) Distance learning: 19 (6.3%) Other methods: 13 (4.3%) | Training courses: 186 (62%) Workshops: 115 (38.3%) Group discussions: 83 (27.7%) Others: 16 (5.3%) |
| Frequency | | | |
| weekly | 128 (42.7%) | 130 (43.3%) | 66(22%) |
| daily | 116 (38.7%) | 46 (15.3%) | 23(7.7%) |
| monthly | 37 (12.3%) | 88 (29.3%) | 81(27%) |
| rarely | 17 (5.7%) | 57 (19%) | 134(44.7%) |
| Reason | | | |
| time | 208(69.3%) | 125(41.7%) | 122(40.7%) |
| place | 104(34.7%) | 134(44.7%) | 112(37.3%) |
| price | 54(18%) | 37(12.3%) | 39(13%) |
| subject | 86(28.7%) | 49(16.3%) | 73(24.3%) |
| speaker certification | ----- | 26(8.7%) | 36(12%) |
| reputation of provider | 13(4.3%) | 14(4.7%) | 23(7.7%) |
| Barriers | | | |
| being busy | 212(70.7%) | 155(51.7%) | 124(41.3%) |
| lack of interest | 31(10.3%) | 50(16.7%) | 36(12%) |
| lack of provision | 26(8.7%) | 50(16.7) | 87(29%) |
| lack of availability | NA | 67(22.3%) | 101(33.7%) |
| lack of suitability | 15(5.0%) | 18(6%) | 15(5%) |
| high cost | 26(8.7%) | 37(12.3%) | 46(15.3%) |

Another method of CME was attending lectures and seminars, for which 106 residents (35.3%) reported attendance at conferences, 74 (24.7%) live casts, 195 (65.0%) presentations, and 19 (6.3%) used distance learning. In terms of the frequency of lectures and seminars for CME activities among residents, the highest frequency of residents (n = 130, 43.3%) reported weekly attendance, compared to 46 (15.3%) who reported daily use of lectures and seminars for CME needs. Also, 88 (29.3%) reported monthly attendance, while 57 (19%) reported rarely attending lectures or seminars. As for why they chose lectures and seminars as a CME method, time was reported by 125 residents (41.7%), place by 134 (44.7%), price by

37 (12.3%), subject by 49 (16.3%), speaker certification by 26 (8.7%), and the reputation of the provider by 14 (4.7%). Barriers to using lectures and seminars for CME activities as reported by residents were being busy by 155 (51.7%), lack of interest by 50 (16.7%), lack of provision by 50 (16.7%), lack of availability by 67 (22.3%), lack of suitability by 18 (6%), and high cost by 37 (12.3%).

Attending courses as a CME activity was reported by 186 (62%) residents, 115 (38.3%) residents reported attending workshops, while group discussions were reported by 83 (27.7%). In terms of the frequency of attending CME courses, the highest frequency of residents (n = 134, 44.7%) reported rare attendance, compared to 81 (27%) who reported monthly attending CME courses. However, 66 (22%) reported weekly attendance and 23 (7.7%) daily. In terms of the reason for choosing courses as a CME method, time was reported by 122 (40.7%), place by 112 (37.3%), price by 39 (13%), subject by 73 (24.3%), speaker certification by 36 (12%), and reputation of provider by 23 (7.7%). Barriers to attending courses were; being busy (n = 124, 41.3%), lack of interest (n = 36, 12%), lack of provision (n = 87, 29%), lack of availability (n = 101, 33.7%), lack of suitability (n = 15, 5%), and high cost (n = 46, 15.3%).

Figure 2 shows residents' preferences regarding various aspects of CME activities. The preferred duration for CME activities for the majority of participating residents (n = 153, 51%) was one to two days, followed by 137 (45.7%) who preferred three to seven days. The majority (n = 194, 64.7%) preferred that CMEs should take place on a workday, compared to 106 (35.3%) who preferred a non-workday. Mornings were preferred by most participants (n = 216, 72%), with only 45 (15%) preferring afternoons and 43 (14.3%) evenings. Regarding method of evaluation, the highest frequency of residents (n = 135, 45%) preferred a questionnaire evaluation for CME activities, compared to 114 (38%) who preferred group discussion and 55 (18.3%) who preferred verbal assessment.

Discussion

CME, Continuing Medical Education, constitutes a wide range of educational activities that aim for the maintenance, development, and improvement of the knowledge, skills, and professional performance that enable practicing clinicians to provide safe and efficacious clinical services. Lifelong learning remains an indispensable element in enhancing clinical knowledge and professional behavior among practicing clinicians [20], as clinical experience over the years does not necessarily yield higher levels of skills, professional behavior, or knowledge [21, 22]. This study is unique in exploring various aspects of CME activities utilized by resident trainees in Abha City in Saudi Arabia, as well as their opinions of the effectiveness of CME activities and the barriers that hinder accessing them.

This study found that the most popular CME activity among the participating residents was lectures and seminars. Lectures are not just popular in our sample of trainees, but also remain the main source for CME. Around the world, studies exploring physicians' CME preferences agreed with our study findings [6, 23]. Also, a recent exploratory study from Saudi Arabia confirmed that the majority of healthcare professionals preferred symposia and short courses [3]. Indeed, lectures are famous as one of the most common forms of dispensing knowledge among clinicians and have been found to have a positive

impact on knowledge and skills, though they have very little performance-improving effect [6]. The least popular CME activity was electronic activities. These are *non-contact* CME activities, which could be one of the reasons for their unpopularity among trainees [24]. Research has found that the more interaction there is between the adult learner and the educator, the greater the satisfaction with the learning method [23]. Electronic CME activities have certain sophisticated requirements, such as access to smart devices and software and the ability to afford extensive data connectivity costs [25]. Electronic CME activities have many advantages, such as flexibility and individualized learning format [24, 26], and trainees should be encouraged to make effective use of them. Notably, some studies did not find substantial differences between didactic lectures and online teaching methods in improving diagnostic skills among physicians [27, 28].

In the current study, the resident physicians did not show much inclination towards using live casts, or electronic conferencing, particularly for workshops, courses or inter departmental activities. This is an interesting finding, considering that internet penetration rate in KSA at 93.3%, is among the highest globally [29]. This highlights under-usage of an effective resource friendly learning method, which has shown to improve knowledge, attitude and practice of physicians [30]. This trend has been reported earlier by students from a university in Najran, Saudi Arabia, who reported that 97% of them have computer and internet access, yet 73% opted for conventional learning methods.[31]

One of the main findings of this study is that the main barrier against attending all forms of CME was being busy, although it was higher for self-reading than contact CME like attending lectures and seminar courses. Our findings are a stark reminder of the reality of how busy clinical services are nowadays. No matter how motivated a clinician is, time pressures can hamper their CME goals attainment. This finding has been confirmed across national and international studies [32], and indeed little has changed in the past two decades, as a study in the same region some 20 years ago revealed that physicians had little time allocated for CME practice [33]. Time constraints were the second most common reason for not attending CME activities in a Pakistani sample of physicians[34]. The problem of a lack of protected time, we suspect, must have increased in recent times. Contrary to our findings, a recent study from the Eastern Region of Saudi Arabia found that lack of postgraduate education and dissatisfaction with CME activities were the main reported barriers to physicians' accessing CME activities [25]. Interestingly, that study found that high case load is an impetus for physicians to gain extra knowledge and skills and engage in CME more frequently [35].

Another reassuring finding in this paper that almost half of the participants affirmed that conferences improved their clinical practice and academic skills. Also, two out of every three residents confirmed that workshops and courses improved their clinical skills. This overall improvement in clinical skills as an effect of engaging in CME has been well established in several educational papers [36-39] and is consistent with the results of the current study. The results of our study are grounds for cautious optimism and point to improvements in physicians' satisfaction with CMEs over that reported in the last decade[19].

This study did not establish any background factors exerting a significant impact on satisfaction with CMEs, which agrees with the results of another study [40]. It is reassuring that gender was not a determining factor in satisfaction with CME activities. Only few differences were observed between training specialties, and it was worrying that psychiatric trainees were the least satisfied among the participants. Many surveys indicate that dental health professionals are in general more satisfied with CME activities than other health-care workers[39]. This could explain the differences in satisfaction scores between trainees in restorative dentistry and other medical trainees.

This study provided some much-needed answers. While it was comprehensive in assessing the CME practices and needs of the residents, it is limited by the fact that the study concerns resident physicians of one region and its results are not generalizable to all of KSA. Other limit to our study was involved all resident physicians at governmental care hospitals in Abha City which trained hospitals and all residents were considered as trainees' physician.

Limitations of the study were mostly related to being performed in a local region of Saudi Arabia. Generalization of the present study should be performed with some caution.

Conclusions

In conclusion, resident physicians mostly attended conferences, lectures and seminars and to a lesser extent workshops and group discussions for their CME needs. Electronic CMEs were used by a minority of them. They reported workshops and courses most effective in retention of knowledge, improving attitudes, improving clinical skills, improving managerial skills, and in proving practice behaviors. The reported barriers to CME were being busy, lack of provision, lack of suitability and high cost. Based on the findings of this study, it is recommended that online learning be promoted as a CME format for trainees and practicing clinicians in Saudi Arabia. There should be support of residents and clinicians through provision of protected time for their CME activities outside their daily clinical commitments. Future research should focus on the effects of various forms of CME on clinical effectiveness as well as the professionalism and communication skills of physicians.

Abbreviations

Continuing Medical Education (CME), Number(n),Saudi Commission for Health Specialties (SCFHS),standard deviation (SD),Analysis of variance(ANOVA),statistical hypothesis test (t -test),The level of significance (p),King Khalid university (KKU),Research ethical committee (REC),Ear nose throat (ENT),Residents first level(R1)

Residents second (R2), Residents third (R3), Residents fourth(R4),Residents fifth (R5).

Declarations

Ethics approval and consent to participate:

Informed consent was obtained from all residents prior to data collection as written consent. All the selected respondents were given assurance of confidentiality that the information gathered will be used exclusively for research purposes. This study was approved by the Institutional Review Board of the College of Medicine; King Khalid university (KKU) (Reference #: REC: 2018/05/72).

All necessary official approvals to conduct this study were obtained.

Consent for publication: Not applicable.

Availability of data and materials:

The data that support the findings of the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests

Funding: None

Authors' contributions

SA, NM and AM were the main authors of the manuscript. AF planned the study. NM and AF contributed to the data analysis and manuscript writing with assistant and supervision of SA. MA, AA and AM assisted in final analyses and writing the manuscript in final proof article. All authors approved submission of the final manuscript.

Acknowledgments:

The authors would like to thank all the resident physicians, who despite their tight schedules agreed to participate in this work. Without their contribution, this study would not have been possible. We also acknowledge the support of all those who facilitated this work.

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Figures

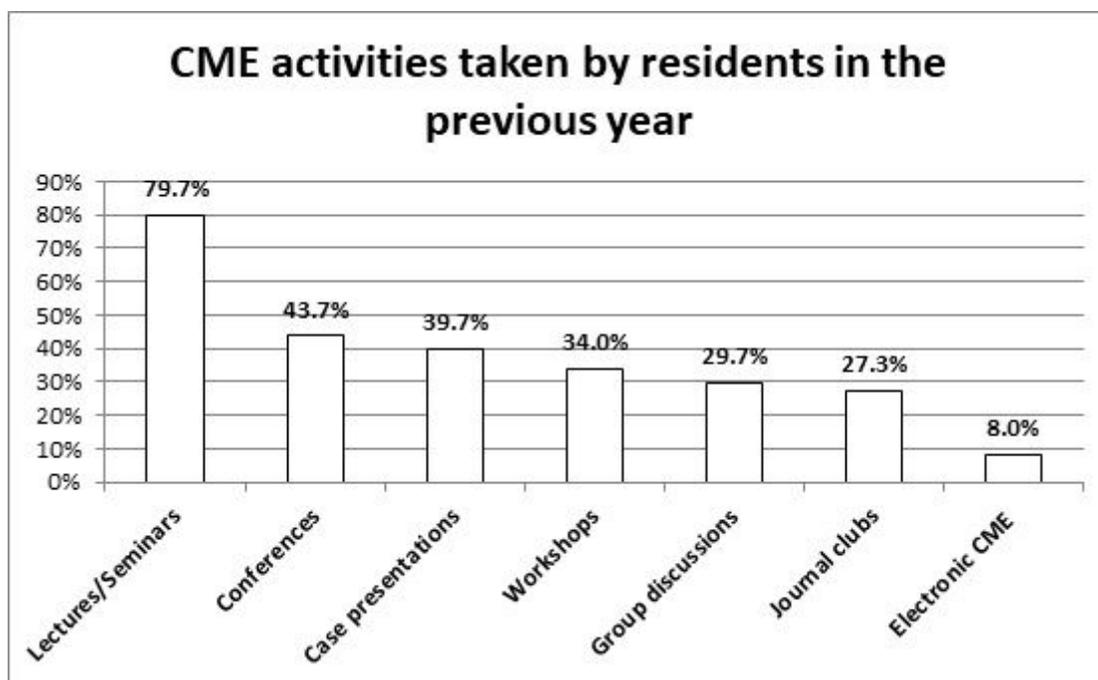


Figure 1

Distribution of CME activity taken by the residents in the previous year

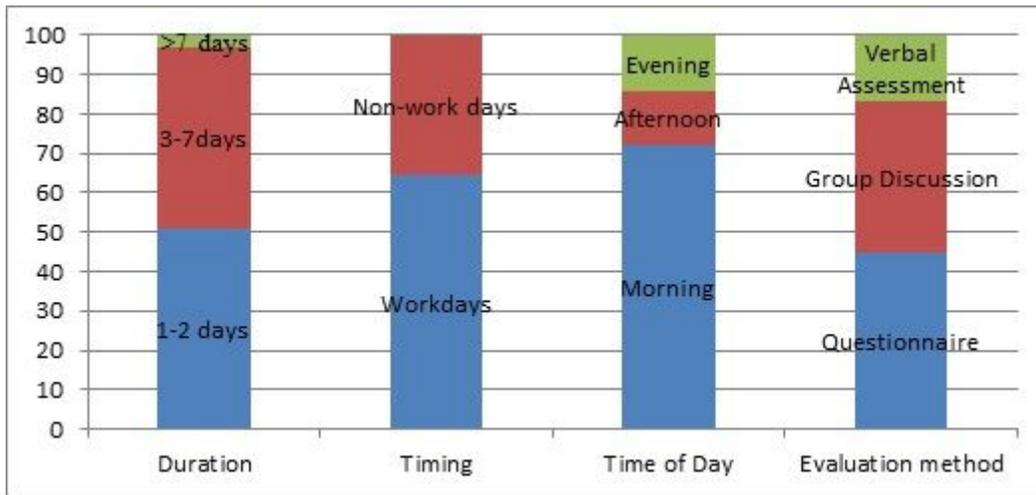


Figure 2

Residents' preferences regarding various aspects of CME activities

Supplementary Files

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