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ORIGINAL ARTICLE

Cochrane, evidence-based medicine and associated factors: A cross-sectional study of the experiences and knowledge of Ethiopian specialists in training

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ABSTRACT

Introduction: Evidence-based healthcare is a core competency for practicing healthcare practitioners and those in speciality training. In sub-Saharan Africa, little is known about the teaching of evidence-based medicine (EBM) in residency program. This survey evaluated the experiences and knowledge of Cochrane, EBM and associated factors among Ethiopian specialists in training.

Methods: A convenient sample of trainee specialists completed a pretested self-administered survey. The majority (93%) were ≤30 years old, males (63%) and 41% in paediatrics speciality. The associations of categorical variables with EBM knowledge was assessed by Fisher's exact or Chi-Square tests. Covariates contributing to EBM knowledge were identified using multivariate logistic regression analysis.

Results: Eighty-three trainees participated in the survey (response rate 88.2%). About 75% have heard about Cochrane but no one recognized Cochrane South Africa. Only 25% of the trainees knew the Cochrane Library but none used it in clinical practice. Most (78%) have heard of EBM, 15% had attended EBM course, 96% wanted to attend EBM course and 81% had positive attitudes to EBM. Trainees EBM knowledge was associated with awareness of Cochrane [Adjusted odds ratio (AOR) = 8.5, 95% Confidence interval (CI) 1.3–54.6, P = 0.02], EBM (AOR = 51.2, 95% CI 2.7–960.8, P = 0.009), and being in third year training (AOR = 28.4, 95% CI 1.9–427.2, P = 0.02). The promotion of EBM in residency hospital (AOR = 22.2, 95% CI 2.2–223.8, P = 0.008) and being aware of Cochrane (AOR = 4.8, 95% CI 1.1–21.7, P = 0.04) were predictors of positive attitude. Familiarity with Cochrane Library was influenced by EBM knowledge (AOR = 6.6, 95% CI 1.4–31.5, P = 0.02) and perceived organization barrier to accessing the resource (AOR = 3.2, 95% CI 1.03–10.1, P = 0.04).

Conclusion: Ethiopian trainee specialists lacked formal EBM training, awareness and use of the Cochrane Library. To improve the healthcare quality and patient outcomes, EBM education should be integrated into residency curricula.

AFRICAN RELEVANCE

- Less is known about the barriers to evidence-based medicine faced by resident doctors in sub-Saharan Africa
- Evidence-based medicine education is lacking in residency training curricula in Ethiopia
- Resident need structured evidence-based medicine education to provide evidence-based healthcare to patients
- Evidence-based medicine teaching in residency training improves the quality of healthcare and patient outcomes in Africa
- Enhanced political leadership and health infrastructure are vital for evidence-based medicine practice in Africa.

Introduction

Evidence-based medicine (EBM)[1] is the integration of clinical expertise with current research evidence, and patient values and preferences [1]. Practicing EBM entails many benefits to African

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[1] Evidence-based medicine.

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healthcare systems. It can bridge the current gap between best practice and patient care, enhances patient outcomes, make treatment cost-effective, and ensure better use of healthcare resources [2,3]. Teaching EBM is part of medical curricula worldwide [4–8] to improve knowledge, attitude and behaviour of undergraduates and postgraduates in the use of evidence [1,4,7]. Currently, EBM is a core part of the curricula for practicing health professionals including specialists in training [4,5].

Cochrane (http://www.cochrane.org/), a world leader in evidence-based healthcare [9] has taken measures to expand EBM in Africa. It prepares and disseminates systematic reviews and publishes in the Cochrane Library (CL)[2] [10] that is free for low-income countries [11]. Established in 1997, Cochrane South Africa (CSA)[3] promotes evidence-based healthcare and supports authors from 25 African countries, including Ethiopia [12]. Yet, sub-Saharan Africa lags behind in integrating EBM into medical curricula [13–16], and healthcare [17–22]. Studies have shown that awareness of Cochrane [23–26] and EBM resource use are either lacking or poor [17–26]. For example, the CL is free at the point of care in Ethiopia, but it is mostly unknown and underused by clinicians [23,26]. Considering the rising healthcare costs, rapid population growth, limited resources and high maternal mortality [27], Africa must promote evidence-based clinical practice to achieve better health outcomes. It was against this background that the 2012 Kigali declaration was signed [14] to improve the use of evidence for policy and clinical decision-making.

Ethiopian specialists in training are registered medical practitioners attending hospital specialty program in paediatrics, gynaecology and obstetrics, surgery, internal medicine, emergency medicine and other specialities [28–30]. Candidates need government sponsorship and one to four year's service in the public health sector to enrol in the program. Although evidence is usually limited on residency program, trainees in sub-Saharan Africa described that their training focuses greatly on service delivery, complained of psychological distress, excessive workload [31], inadequate supervision and lack of training in EBM [21] and research [32]. Apart from discontent with the training program, their information seeking behaviour [17] and barriers to EBM [19–21] have not been widely evaluated either. In Ethiopia, specialists in training are key member of the hospital healthcare team and provide patient care. As physicians, they make diagnosis and treatment decisions daily to solve clinical problems. Thus far, no evidence is available to describe their awareness, knowledge and attitudes regarding EBM. Understanding their perspectives helps to fill the knowledge gap and to develop educational intervention. This survey aimed to assess the experiences and knowledge of Cochrane, EBM and related factors among specialists in training in Ethiopia.

Methods

We conducted a cross-sectional study in 2014/15 at Tikur Anbessa Specialized Hospital (TASH)[4] [28] and St. Paul's Hospital Millennium Medical College (SPHMMC)[5] [29], in Addis Ababa, Ethiopia. The TASH is the largest teaching referral hospital in Ethiopia with 700 beds, outpatient, inpatient and emergency services. The study hospitals offer residency-training programs in a range of medical specialities. The American International Health Alliance has established Learning Resource Centres at the hospitals to enhance access to evidence-based knowledge resources [33], and has funded the obstetrics and gynaecology residency program at SPHMMC [34]. The survey was an audit and part of a training program to generate baseline information. Although ethical approval was not required, trainees were informed about the benefits of the survey, assured confidentiality, and voluntarily took part.

They were a convenient sample of specialists in training from various medical specialities, level of training and recruited by their respective hospitals. Trainees were eligible to participate if enrolled in speciality training and selected by the hospital to attend the 2014/15 EBM training.

The following questions guided the survey: are Ethiopian specialists in training aware of Cochrane and the Regional Cochrane Centre for Africa? Are they aware of and utilize the free online CL to inform clinical decision-making? What barriers do they face to access the CL and propose to overcome these barriers? What is their awareness, knowledge, training and attitude regarding EBM? and what are their educational needs to practice EBM? To answer these questions, we adopted a survey designed by CSA [25] and pre-tested it before data collection. The internal consistency of the pretested survey was determined by pilot testing and was satisfactory (Cronbach's alpha 0.78).

The self-administered survey was distributed and collected before EBM training by one of the authors (OA). The survey took a median time of 11 minutes (Interquartile range 9 to 20) to complete. To assess the overall EBM knowledge, seven items with variable response types were used (yes/no, multiple choice, Likert scale). They were: awareness of Cochrane; knowledge of CSA; familiarity and use of the CL; knowledge of the CL amid Ethiopian clinicians; EBM awareness, training, and knowledge. To evaluates EBM knowledge level, a six-point Likert scale responses was used (none, poor, average, good, very good, excellent). The knowledge score was the total of correct answers for seven items, ranging from a minimum of '0′ to a maximum of '11′. The Shapiro-Wilk test confirmed the total knowledge scores was not normal (W statistics = 0.95, df = 83, $P = 0.003$), and thus we used the median score of four to categorize the overall EBM knowledge scores. A total score of ≥ 4 constituted adequate EBM knowledge and a low score (< 4) signified poor EBM knowledge.

Three questions requiring a 'yes', 'no' or 'do not know' answer measured trainees' attitudes towards EBM: EBM promotion in residency hospital; perceived benefit of EBM in clinical practice; and interest in EBM course. Each yes answer scored 1 point, with a total score ranging from '0′ to '3′. The Shapiro-Wilk test verified the total attitude scores lacked normality (W statistics = 0.77, df = 83, $P < 0.001$). Hence, we used a median score of two to classify the total attitude scores. Those with a median score of two or more were considered having a positive attitude and those with a low score (< 2) constituted having a negative attitude.

We conducted descriptive frequency analysis for each variable, summarised result using descriptive statistics and presented in the form of text, proportions, percentages, tables and graphs. The primary outcome variable was overall EBM knowledge, and the independent variables were demographic factors and other variables associated with the outcome variable. We assessed univariate associations of categorical variables with EBM knowledge in contingency tables using Fisher's exact or Chi-squared tests with Yates' correction. Spearman's correlation coefficient was used to test for multicollinearity and evaluate the relationship between the outcome variable and independent variables. A multivariate logistic regression analysis was applied to identify covariates that contribute to the outcome variable, adjusting for the effects of other variables. The magnitude of the associations between the independent factor and the outcome variable was expressed by odds ratio with 95% confidence interval. Data were analysed with IBM SPSS Statistics for Windows (V 20.0).

Results

Out of 94 eligible trainees who attended the EBM training, 83 took part in the survey (participation rate, 88%). Thirty-six (43%) were from SPHMMC and 47 (57%) from TASH. The respondents (n = 83) and non-respondents (n = 11) were similar in age and socio-demographic

[2] Cochrane Library.
[3] Cochrane South Africa.
[4] Tikur Anbessa Specialized Hospital.
[5] St. Paul's Hospital Millennium Medical College.

Table 1
Socio-demographic profiles of specialists in training, Ethiopia.

Characteristic	N	%[a]
Sex:		
Male	52	63
Female	31	37
Age group (years):		
≤30	77	93
31–40	6	7
English reading ability:		
Very comfortable	59	71
Comfortable	24	29
English writing ability:		
Very comfortable	51	61
Comfortable	32	39
Specialty type:		
Internal Medicine	17	21
Paediatric	34	41
Obstetrics & Gynaecology	29	35
Emergency Medicine	3	4
Year of residency:[b]		
Year 1	25	34
Year 2	27	37
Year 3	22	30

[a] Percentages rounded to the nearest whole number.
[b] Figures may not add up to total because of missing data.

characteristics (data not shown). Trainees recruited from TASH and SPHMMC were comparable in a range of socio-demographic features, thus data from the 83 respondents form the basis of this study.

The large majority of trainees were Ethiopian nationals (99%), males, ≤30 years of age, specializing in paediatrics, and in second year of residency. Most were very comfortable reading and writing in English (Table 1). Sixty-four (77%) trainees spoke Amharic as local language, 18 (22%) other local languages and one was from South Sudan and spoke English. The trainees in emergency medicine were all ≤30 years old, in third year, and two were males and one was a female.

Knowledge of Cochrane and evidence-based medicine

Sixty-two (75%) trainees including those in emergency medicine had awareness of Cochrane, while 21 (25%) were not. The trainees gained awareness from various sources (Fig. 1). Awareness of Cochrane was 77% in TASH group and 72% in SPHMMC group ($P = 0.84$). About 52% of trainees felt that Ethiopian clinicians were aware of Cochrane. Seventy-nine (95%) trainees failed to recognize CSA as their Regional Cochrane Centre and four (5%) did not answer the question. Around 78% have heard of EBM, of which 77% were from TASH and 80% SPHMMC, with no major difference (P = 0.87). Only 12 (15%) trainees had attended EBM course, of these 11% were TASH and 19% from SPHMMC (P = 0.42). Practically 46% rated their EBM knowledge as none or poor, 32 (39%) average, and 13 (16%) as good or very good, with no major difference between the groups (P = 0.41).

Factors associated with adequate knowledge of evidence based medicine

Fifty-two (63%) trainees including those in emergency medicine had a median score of four and classified as having adequate EBM knowledge and 31 (37%) inadequate knowledge. The proportion of trainees with adequate knowledge was similar between TASH (70%) and SPHMMC (53%) groups ($P = 0.16$). Adequate EBM Knowledge was associated with the following factors: awareness of Cochrane ($P < 0.001$), EBM awareness ($P < 0.001$), speciality year ($P = 0.005$) and EBM promotion in residency hospital ($P = 0.001$), but not with trainees' demographic factors (Table 2). In regression analysis, however, awareness of Cochrane and EBM, and being in third year were significant predictors of adequate EBM knowledge (Table 2). The likelihood of adequate EBM knowledge for trainees aware of Cochrane was 8.5 times greater than those who were unaware. Those familiar with EBM were also 51.2 times more likely to have adequate EBM knowledge compared to those without. The odd of adequate EBM knowledge for trainees in year three was 28.4 greater compared to trainees in year one or year two of residency.

Attitude towards evidence based medicine

Table 3 shows how trainee specialists responded to the three attitude questions. Most including two emergency medicine trainees agreed EBM was beneficial in clinical practice. Over half also agreed their hospital promotes EBM and most expressed interest to attend further EBM course. Forty-one (87%) TASH and 26 (72%) SPHMMC trainees' perceived EBM was beneficial in clinical practice, with no significant difference in response ($P = 0.08$). Slightly more in TASH (68%) than SPHMMC (39%) felt their hospital promoted EBM ($P = 0.01$). The large majority from both TASH (96%) and SPHMMC (97%) groups strongly supported attending professional development training in EBM ($P = 0.3$).

Seventy (84%) trainees had a median score of two or more and regarded having a positive attitude and 13 (16%) a negative attitude towards EBM. Comparable number of trainees from TASH (94%) and

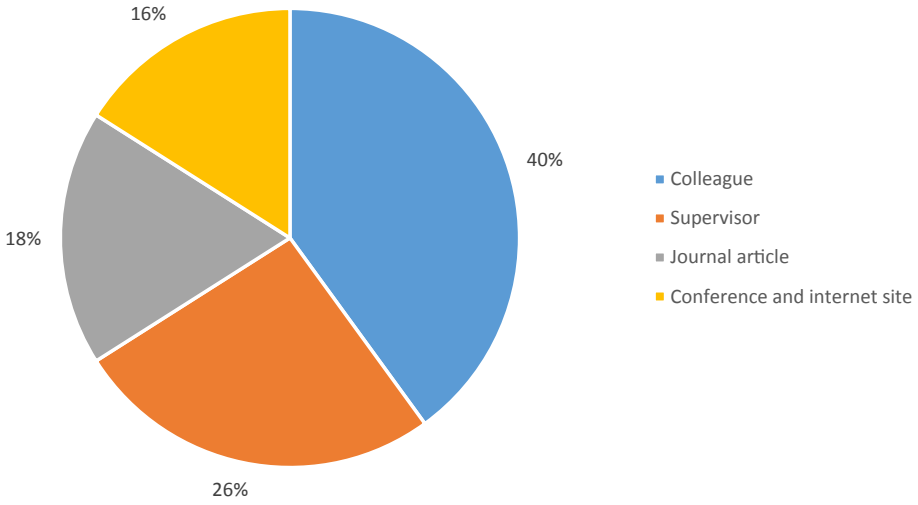

Fig. 1. How specialists in training gained their awareness of Cochrane.

Table 2
Factors associated with EBM knowledge among specialists in training, Ethiopia.

Variable	Total (%)[a]	Adequate knowledge n (%)[a]	Bivariate correlation analysis	Multiple logistic regression analysis		
			Spearman's correlation coefficients (*P* value)	Crude ORs[b] (95% CI)[c]	Adjusted ORs[b] (95% CI)[c]	*P* value
Awareness of Cochrane						
No	21 (25)	5 (10)	0.47 (< 0.001)	1.0[d]	1.0[d]	–
Yes	62 (75)	47 (90)		10.0 (3.1–31.9)	8.5 (1.3–54.6)	0.02
Awareness of EBM						
No	18 (22)	2 (4)	0.56 (< 0.001)	1.0[d]	1.0[d]	–
Yes	65 (78)	50 (96)		26.7 (5.5–129.3)	51.2 (2.7–960.8)	0.009
Speciality Year[e]						
Yr 1	25 (34)	10 (22)	0.38 (0.001)	1.0[d]	1.0[d]	-
Yr 2	27 (37)	17 (37)		2.6 (0.8–7.8)	1.5 (0.3–6.6)	0.61
Yr 3	22 (30)	19 (41)		9.5 (2.2–40.8)	28.4 (1.9–427.2)	0.02
Hospital promotes EBM						
Do not know	17 (21)	7 (14)	0.39 (< 0.001)	1.0[d]	1.0[d]	-
No	20 (24)	8 (15)		0.9 (0.3–3.6)	0.5 (0.1 – 3.6)	0.47
Yes	46 (55)	37 (71)		5.8 (1.8–19.7)	1.6 (0.3–9.9)	0.59

[a] Percentages rounded to the nearest whole number.
[b] Odds ratio.
[c] Confidence interval.
[d] Reference category.
[e] Figures may not add up to total because of missing data.

Table 3
Self-reported attitudes towards evidence-based medicine (EBM) among specialists in training, Ethiopia.

Item	Yes n (%)[a]	No n (%)[a]	Don't know n (%)[a]
EBM is beneficial in clinical practice	67 (81)	3 (4)	13 (16)
EBM is promoted in my residency hospital	46 (55)	20 (24)	17 (21)
I am interested in EBM training	80 (96)	1 (1)	2 (3)

[a] Percentages rounded to the nearest whole number.

SPHMMC (72%) were judged to have a positive attitude towards EBM ($\chi^2 = 5.54$, df = 1, $P = 0.019$). Further, univariate analysis showed positive attitude was associated with perceived benefits of EBM ($P < 0.001$), EBM awareness ($P = 0.006$), EBM promotion in residency hospital ($P < 0.001$), interest in EBM course ($P = 0.003$), speciality year ($P = 0.002$), residency hospital ($P = 0.02$), and awareness of Cochrane ($P = 0.02$). These relationships were also observed in bivariate correlation analysis. However, in multivariate analysis, EBM promotion in residency hospital [Adjusted odds ratio (AOR) = 22.2, 95% CI 2.2–223.8, $P = 0.008$] and awareness of Cochrane (AOR = 4.8, 95% CI 1.1–21.7, $P = 0.04$) were the only predictors of positive attitude. Trainees who alleged EBM promotion in residency hospital, rather than those who disagreed were about 22.2 times more likely to hold a positive attitude. Those aware of Cochrane were also roughly 5 times more likely to have positive attitudes towards EBM than those lacking awareness of Cochrane.

Knowledge of the free on-line Cochrane Library

Seventy-seven (93%) trainees answered the question on awareness and accessing the free online CL. Nearly 25% were aware and knew how to access it, but most (75%) were not. Familiarity with the CL was comparable between TASH (26%) and SPHMMC (19%) groups ($P = 0.7$). Nearly 51% affirmed that Ethiopian clinicians were aware of the CL. Cross-examining the 25% awareness level against trainees' demographic factors and other study variables revealed a significant relationship with EBM knowledge ($P = 0.006$) and type of perceived barriers to the CL ($P = 0.04$). In bivariate correlation analysis, awareness of the CL was positively correlated with EBM knowledge (Spearman's rho = 0.30, $P = 0.006$) and negatively with type of perceived barriers (Spearman's rho = -0.26, $P = 0.02$). In a multivariate analysis, EBM knowledge [Adjusted odds ratio (AOR) = 6.6, 95% CI (1.4–31.5), $P = 0.02$] and type of perceived barrier [AOR = 3.2, 95% CI (1.03–10.1), $P = 0.04$] were predictors of awareness of the CL. Trainees with adequate EBM knowledge, rather than inadequate knowledge were seven times more likely to have awareness of the CL. Those who cited organizational barriers were about three times more likely to be aware of the CL compared to those who stated personal hurdles to awareness of the CL.

Perceived barriers to access and utilize the Cochrane Library

None of the 19 trainees with awareness of the CL had accessed it. Thirteen (68%) trainees cited lack of training in searching skills and 17 (90%) poor infrastructure. Overall, 61 (74%) of the trainees gave personal barriers for the lack of awareness of CL and 22 (27%) organizational barriers relating to poor infrastructure and internet access at residency hospital. Two of the emergency medicine residents faced organizational barriers and one a personal barrier. Those unaware of the CL were more likely to report personal hurdles than those with awareness ($\chi 2 = 5.14$, df = 1, $P = 0.02$). Personal barrier to the CL was 94% by medical interns, 79% obstetrics and gynaecology, 62% paediatrics and 33% by those in emergency medicine, hence medical interns were marginally more likely to cite personal barriers than other trainees ($P = 0.02$). Personal barriers was 33% by trainees aged 31–40 years and 77% by those ≤30 years old, suggesting young trainee specialists were slightly more likely to describe personal barriers to the CL than older trainee specialists ($P = 0.04$).

Perceived enablers to access and use the Cochrane Library

The trainee specialists identified possible enablers to deal with the barriers they perceived towards the CL in their residency hospital. Thirty-four (41%) trainees sought in-service training in information searching the CL; 25% suggested infrastructure upgrade including access to reliable internet services; and 27% proposed more awareness-raising campaign on the CL targeting all healthcare professionals in Ethiopia.

Discussion

This survey determined the experiences and knowledge of Cochrane, EBM and the associated factors among Ethiopian specialists in training. The majority (75%) were aware of Cochrane. The finding concurs with two studies [24,26] but greater than the 44% reported by Abdulwadud [23] and the 35% by Oliver & Young [25]. The discrepancy could be due to different recruitment strategies and methods. The two studies administered the surveys by email, had smaller samples and achieved less than 50% response rates. One of the studies [23] also recruited various health professionals from the community, and the other [25] focused on Cochrane authors in all developing countries. Unlike the two studies [23,25], our survey was face-to-face, recruited only trainee specialists and achieved 88% participation rate. The majority in this survey did not know CSA as their reference Cochrane Centre, in accord with past studies [23,24,26]. The CSA runs capacity-building programs like the Reviews for Africa and HIV/AIDS Mentoring Programs [12] for 25 countries including Ethiopia. Poor awareness of CSA is a hurdle for trainees to benefits from the programs CSA provides to develop their EBM knowledge and research skills. Our sample was unrepresentative and trainees assessed their own awareness, which makes the generalizability of the finding doubtful to other settings or total specialists in training. Anyhow, a strategy that targets teaching hospitals would enhance awareness of CSA among trainee specialists in Ethiopia.

Nearly 78% of our trainees had awareness of EBM. This result concurs with other studies [35–37] but differs from the 85% among Sudanese residents [21]. That study randomly recruited only third year residents and used interview technique to collect data. This survey however was self-administered and recruited a convenient sample of residents from all levels of training. Consistent with previous studies [18–22,26,35–42], 85% of our trainees did not attend EBM course. Awareness of Cochrane and EBM, and being third year resident has contributed to EBM knowledge. Possibly, trainees gained their knowledge through personal experience because most were unexposed to EBM education. EBM Knowledge and skills is critical to apply EBM in clinical practice as previously reported [37,39]. Our findings lack robustness since the sample was unrepresentative of the target population and not randomly selected. Conversely, only 15% had attended EBM course and 96% were keen to attend EBM course. The inclusion of EBM in residency curricula enables trainees to recognize the importance of practicing EBM through learning and applying the principles during and post speciality training.

Most trainees showed a positive attitude towards EBM, in agreement with empirical evidence [20,21,26,35–42] and a resident study in Sudan [21], which found positive attitude towards EBM among residents who did not attend EBM training. Possibly, our trainees gained the attitudes through experience or from reading EBM materials at the Learning Resource Centres in their hospitals. Consistent with previous studies [39,42], this survey revealed that trainees who reported EBM promotion in their hospitals and aware of Cochrane displayed positive attitudes towards EBM. This evidence confirms a hospital that promotes EBM could positively influence trainee's attitudes. While our trainees' attitude looks conducive, it is hard to make valid inferences about the entire population of Ethiopian specialist in training. We also relied on self-report attitude prone to bias and unsure if trainees' positive attitude will translate into good clinical behaviour.

Trainees cannot keep up to date with all the latest evidence as the volume of evidence increases quickly [9]. Based on World Bank classification [11], Ethiopia is a low-income country with free online access to the Cochrane Library through Wiley-Blackwell, the Health Inter Network Access to Research Initiative, and the International Network for the Availability of Scientific Publications' Program. However, only 25% of trainees were aware and none of them used it to inform clinical decision-making. This finding agrees with the literature [19,22,26,36,41,42] and validates poor use of the CL by clinicians in Africa [19,22,26]. In Nigeria, about 7% [22] to 10% [19] of physicians use the CL. In accord with past evidence [42], trainees with adequate EBM knowledge and perceived organizational barriers had better awareness of the CL. This highlights that adequate EBM knowledge may influence the information seeking behaviour to utilize EBM resource [17,36]. The CL is a useful EBM knowledge source that can positively influence trainee's clinical practice because it has up-to-date systematic reviews pertinent to Ethiopia, especially on pregnancy and childbirth, HIV/AIDS, infectious diseases, public health, acute respiratory infections and other priority health conditions [10]. Trainee specialists have unmet training needs to use the CL. Addressing their needs enhances awareness of the resource, use of evidence, and the quality of care provided to patients. Otherwise, they will rely on printed materials such as textbooks or internet for medical information to manage patients [17].

Our trainees identified personal and organizational barriers to access the CL, concurring with the literature [17–22,26,35–39,43,44]. The result also replicates the finding from North West Ethiopia [44], which found health workers in public health facilities had neither a library service nor internet to access to search for medical information. Information technology and knowledge management help to strengthen the health system and patient care delivery. Trainees require efficient infrastructure with reliable internet services to search EBM resources and make informed clinical-decisions [2]. Health workers with internet access do practice EBM better compared to those without internet access [39]. Overcoming the barriers is important to influence their information seeking behaviour and professional practice [36]. To provide the trainees with skill-building training on the CL and infrastructure upgrade of the residency hospital are essential. The latter can ease access to online EBM resources, e-journals and EBM tools [36,39,44]. Trainees have strong motivation to learn the CL and encouraging them to download the free CL tutorial from the Cochrane website can help build their information searching skills.

The majority (93%) of trainee's are young physicians aged $\leq$30 years. Teaching hospitals can cultivate a culture of EBM by evolving their professional competency of critical thinking, attitude, information seeking behaviour and durable learning skills [45,46]. Given EBM is absent from Ethiopian medical education [Azazh A, October 2016, personal communication], the traditional curricula should be aligned with international and regional recommendations [4,6,14]. The designed program replicate adult learning principles, integrated into clinical services, and harmonized with classroom teachings [2,4,45–47], include the principle of EBM, formulating an answerable clinical question, evidence searching, critical appraisal and research skills development. The traditional theory-based teaching must change to competency-based training to incorporate journal clubs, clinical meetings, and use of EBM guidelines [2,48]. Establishing a regular evidence-based journal club within institutions promotes an increased awareness of EBM, keep up-to-date with the literature and educate trainees to assess research evidence and its applicability to clinical practice. For trainees to be familiar with locally relevant guidelines, their selection need to mirror the disease burden of Ethiopia, particularly HIV/AIDS, maternal and children, emergency care and other priority conditions. Overlooking the training needs of academic core faculty and clinical supervisors undermines efforts to implement EBM education. Future educational initiatives should also identify and address their EBM training needs to support trainees effectively in classroom and clinical settings [4,36].

The current survey has strengths and weaknesses. There are four main strengths: it was the first survey from the perspectives of trainee specialists; we adopted CSA survey, pretested and reported the reliability; conducted the research as part of training with no additional funding; and achieved a high participation rate. The survey has a few weaknesses. We recruited convenient unrepresentative trainees from only two hospitals; employed a cross-sectional study design and the findings are only valid to a single point of time; and trainees' responses

were likely to be affected by social desirability bias, a type of response bias that is they may incline to give favourable answers instead of honest answers. We also did not carry out power calculation for the present survey and the wider 95% confidence interval for some odds ratios suggests small sample size. Thus, the findings of this survey necessitate cautious interpretation. Despite the limitations, the findings contribute to the knowledge base and present baseline information to educational authorities. Further research with a larger and representative sample size should identify areas in which trainee specialists could be trained and supported to practice EBM.

Conclusion

Attitude towards EBM was generally good among Ethiopian specialists in training. However, they lacked proper EBM training, awareness of the Regional Cochrane Centre, use of the free online Cochrane Library, and alleged infrastructural hurdles in residency hospital to access and use the EBM resource. Ethiopian specialists in training have realistic need for EBM education. Teaching hospitals could influence their professional practice by teaching EBM and upgrading the health infrastructure including internet services. Currently, Ethiopia has 35 medical schools. Reforming the traditional undergraduate curricula is vital to optimize the medical education system, because the graduate physicians' population will soon increase and more graduates would like to join the residency programs. Planned EBM teaching enhances not only the quality of medical education but also the quality of healthcare provided to patients. Currently, Ethiopia has no national policy to facilitate the uptake of evidence in health and education sectors. For instance, EBM experts are lacking at the Federal Ministry of health to offer advice to policy-makers on public health programs such as maternal and newborn health [49]. A national policy for EBM program could lay a foundation to support EBM in medical education, healthcare system and health policy in Ethiopia.

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Dissemination of results

We shared the findings with academic and senior staff members at the study hospitals. We also plan to present at the annual conference such as Ethiopian Medical Association, Public Health Association, Ethiopian Society of Emergency Professionals, and to stakeholders via presentation, reports and hospital newsletters. Our findings will also provide useful baseline information for future studies examining the same topic among residents in Ethiopia.

Author contribution

OA conceived and designed the survey, supervised data collection, entered and analysed the data, and drafted the manuscript. AA, AM, TB, FD, and HGE coordinated and supervised data collection at TASH. BN organized and collected data at SPHMMC. All authors revised the draft manuscript, contributed intellectually and approved the final manuscript. All authors agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of interest

The American International Health Alliance funded the EBM training in the study hospitals, but was not involved in any other aspect of the work. The authors declare no further conflicts of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.afjem.2019.01.005.

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