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Research Article

Information Services in Evidence Based Medical Education: A Review of Implementation Trends

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Abstract

Objective – Evidence based medical education requires supportive information services to facilitate access to the needed educational evidence. Information services designed specifically for evidence based medical education are limited or locally developed for educational units. For librarians to have an opportunity to cooperate efficiently with medical educators in evidence based medical education, they require an empirical prototype for transmission of clinical evidence at the right place and the right time. Therefore, there is a need to recognize types of information services which support evidence based medical education. The purpose of this review is to identify implementation trends of evidence based educational information services.

Methods – We found related studies by implementing search strategies in PubMed, EMBASE, Web of Science, Scopus, LISTA, and Google Scholar with keywords like: evidence based medical education, information services, and library services. We used reference-checking and citation-checking of related articles for completing the process of locating relevant articles. After employing inclusion and exclusion criteria, we selected 11 articles for inclusion in the review and analyzed them using a narrative review technique.

Results – After analyzing the results of the included studies, we identified two elements categorized as program development and five elements categorized as implementation trend. Prerequisites of program and the process of designing were essential parts of program development of information services. Schedule and type of access, how to receive educational-clinical questions, information services types, responding time, and providing evidence based outputs were the elements of the implementation process of educational supported information services.

Conclusion – Designing an evidence based educational information service strongly depends on the information needs of learners at each educational level. Schedule and type of access to information service, time of responding to the received query, and preparation of evidence based output are essential factors in designing practical educational-developed information services.

Introduction

In the 1990s, David Sackett introduced the concept of evidence based medicine (EBM). EBM was defined as the use of up-to-date, best evidence in clinical decision making for a better understanding of causation and prognosis of disease, and selecting more appropriate diagnostic tests and treatment strategies based on patient preferences and the clinical condition of the patient (Sackett et al., 1996). In the practice of EBM, clinicians complement their clinical expertise with the best available evidence (Sackett et al., 1996), which evidence is available

from systematic clinical research like systematic reviews, cohort studies, and randomized control trials (Burns et al., 2011).

EBM and its applications in different functions of medicine have empowered the medical community (Djulbegovic & Guyatt, 2017; Sur & Dahm, 2011). Medical practice, healthcare management, clinical research, and of course, medical education has been affected by EBM principles (Djulbegovic & Guyatt, 2017; Shortell et al., 2007). Evidence Based Education/Best Evidence in Medical Education (EBE/BEME) makes an effort to utilize evidence in education (Davies, 1999) and reshape the practices and approaches of learner training based on the best available evidence (Harden et al., 2000; Hart & Harden, 2000). The goal of EBM in clinical practice is to enhance patient treatment, but in medical education, educators train learners in the practice of EBM to empower them to use evidence in clinical practice (Guyatt et al., 1992).

Medical educators try to have an updated and evidence based approach to their teaching practice in processes such as curriculum revision or implementing new instructional techniques (Poirier & Behnen, 2014). In the evidence based paradigm of teaching, educators combine up-to-date, quality evidence with previous experience and current educational approaches (Chessare, 1996). Typical tasks required for evidence based practice in medical education include phrasing a question, designing a search strategy, appraising the evidence, and making the required intervention in the teaching approaches (Davies, 1999; Harden et al., 2000; Hart & Harden, 2000). A primary challenge of the above procedure is searching the published literature (Poirier & Behnen, 2014).

Finding the best evidence is one of the main challenges of EBE/BEME for medical educators; often they need assistance to effectively find required evidence (Chessare, 1996; Harden et al., 2000; Reed et al., 2005). Difficulty in accessing the empirical educational knowledge has a multidimensional nature. Medical instructors have expressed some barriers to implementing evidentiary information in education. Lack of time for finding evidence based knowledge, the volume of research evidence, lack of educational evidence, lack of access to evidence based educational databases, and difficulty in finding educational evidence were found to be obstacles for accessing relevant evidence (Emami et al., 2019; Onyura et al., 2015; Sandars & Patel, 2015; Suttle et al., 2015; Thomas et al., 2019). Searching for evidence consists of two core challenges: how to search for evidence and where to search for evidence (Haig & Dozier, 2003a, 2003b).

Information services fulfill the need for access to evidence in medical practice. The main purpose of information services in a health system is to enhance the decision-making of clinicians in the treatment of patients. The actors of an information service are skilled librarians, and the core activity of information services is transforming requests for evidence into relevant, evidence based information which then impacts clinical decision making (Fennessy, 2001). In the process of evidence based decision making, information services with different implementation trends were developed to supply qualified and up-to-date evidence for healthcare practice.

Jordan and Porritt (2004) established an information service to provide evidence based information for clinicians and patients. The information service supported both access to evidence and education for how to utilize what they could access. MCMASTER+ was another type of evidence based information service, which organized information based on evidence hierarchy and facilitated finding required evidence to address related clinical questions (Holland & Haynes, 2005). McGowan et al. (2010) developed an information service to provide evidence for primary care practitioners and enhance clinical decision making. These information services to support clinical practice had commonalities in their implementation processes. For example, the process of developing reference services for clinicians

consisted of two main components: first, selecting and adapting appropriate technology, and second, training the librarian to deliver the information service. Most of the information services supporting clinical decision making were developed on the web with a well-defined, user-friendly interface that enhanced physician access to the best evidence (Holland & Haynes, 2005; Jordan & Porritt, 2004; McGowan et al., 2010). The process of delivering needed evidence began from searching, appraising, and summarizing evidence to transferring it into practice (Davies et al., 2017; Holland & Haynes, 2005; Jordan & Porritt, 2004; McGowan et al., 2010), and reviewing and updating collected evidence periodically (Jordan & Porritt, 2004).

Aims

All of the above evidence based information services were established for clinical practice, but providing evidence for medical education needs its own educational-developed information services (Emami et al., 2019; Onyura et al., 2015). Onyura et al. (2015) stated that the delivery approaches for evidence based knowledge currently available were insufficient and there was a need for new approaches for delivering synthesized evidence that have a concise presentation and are accessible at the point-of-need. In this respect, identifying the implementation trends of information services designed for evidence based education can be prototypical for designing evidence based information services for medical education.

Based on the hierarchy of information services in the Library, Information Science & Technology Abstracts (LISTA) database thesaurus (EBSCO, n.d.-a), information services are developed to fulfill information needs in various fields such as business, agriculture, community, education, and more. In the LISTA thesaurus, "information services in education" was defined as the "use of data storage, organization, search, retrieval, and transmission services in education" (EBSCO, n.d.-b). In the current study, we identified search, retrieval, and transmission aspects of information services in education. Therefore, the aim of this review was to identify the types of information services that were provided for EBE/BEME and compare the trends of supplying evidence for supporting student teaching and learners training under the concept of Evidence Based Educational Information Services (EBEIS).

Table 1
Search Strategy of PubMed

No.	Search Strategy	Results
1	("Education, medical"[Exp.] OR teaching[NoExp.] OR education[NoExp.] OR "education, professional"[NoExp.] OR "education, graduate" [NoExp.] OR "education, continuing" [NoExp.] OR "education, medical, continuing" [MeSH]) OR (teaching OR training OR education* OR instruction*) [ti, other term]	1,522,557
2	("Evidence-based medicine" [Exp.] OR "evidence-based practice" [NoExp.] OR Evidence-based emergency medicine--education[MeSH] OR Evidence-based medicine--education[MeSH: NoExp] OR evidence-based practice--education[MeSH:NoExp]) OR "evidence-based"[ti, ab, other term]	163,230
3	("Information services" [NoExp.] OR "Information storage and retrieval" [NoExp.] OR librarians [MeSH] OR "libraries, medical" [NoExp.] OR "libraries, hospital" [MeSH] OR "library services" [NoExp.]OR"information dissemination" [MeSH]) OR (librar* OR information*)[ti, other term]	161,765
4	1 AND 2 AND 3	1,421
5	Limit to: English language	1,344
6	Limit to: 2010/1/1 and 2020/1/2	721

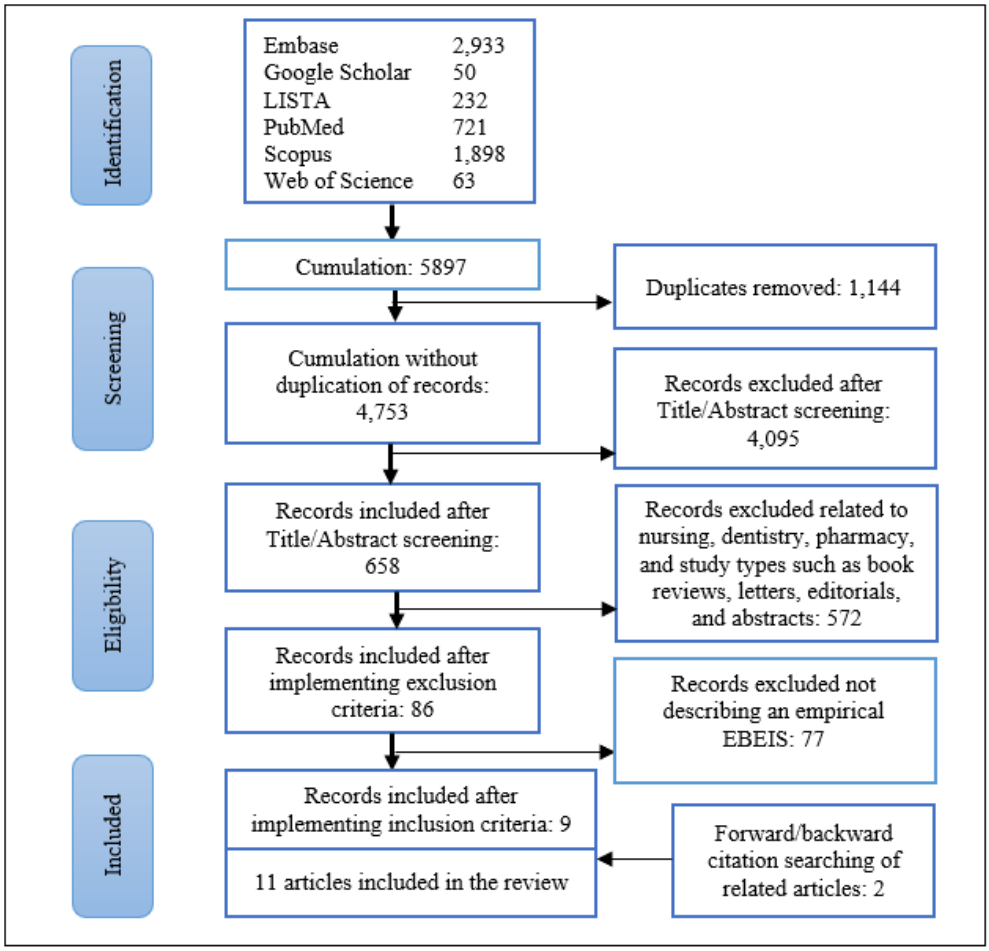

Figure 1
PRISMA flowchart of study selection (Liberati et al., 2009).

Methods

Article Selection

We accessed studies on information services that supported EBE/BEME by searching databases and performing forward and backward citation tracking of related articles. We searched PubMed, Embase, Web of Science, Scopus, LISTA, and Google Scholar using keywords such as "evidence based education," "evidence based medical education," "information service," and "library service." Table 1 depicts our search strategy for the PubMed database.

Inclusion and Exclusion Criteria

After implementing search strategies in each database, we excluded non-English articles, as well as articles focused on evidence based dentistry, nursing, and pharmacy studies. Because fields like dentistry have unique educational needs versus medicine, we omitted them from the review. We also excluded study types such as letters, chapters, book reviews, editorials, conference abstracts, and viewpoints. We included studies that described an empirical experiment on the structure and trend of implementing an EBEIS. In this review, it was

important that the information services were not applied in non-educational clinical settings, nor were proposed templates or opinions. We ended up with 11 articles published between 2010 and 2020 included in the review. We have described the process of selecting related studies in Figure 1.

We compared the bibliographic and introductory data of included studies in Table 2.

Data Analysis

In this study, we used a narrative review technique for bringing together findings of the different studies and accomplishing the review. Narrative analysis with tabular accompaniment is a typical analysis technique for reviews (Grant & Booth, 2009). A narrative review synthesizes the available evidence from different studies to provide a conclusion from collected literature (Green et al., 2006). For the analysis of included studies, first we read the articles carefully. Second, we compared the implementation trends of applied information services in the educational clinical setting and identified the similarities and differences between structures of implementation trends. Third, we extracted the related themes for each similar part of the identified structure through note-taking. Also, we considered the related themes for any differences between applied information services. Finally, we organized the related themes of similar parts of implementation trends within the comparison tables.

Table 2
Introductory Data of Included Studies

First author	Year published	Year implemented	Country	Setting	Type of education	Trend of implementation
(Aitken et al., 2011)	2011	2009	Canada	Morning report/ rounds/ team conference	RE[a]	Searching evidence based information and delivery of documents
(Neves & Dooley, 2011)	2011	2008-09	Canada	Case-oriented problem solving curriculum	UGME[b]	Curriculum architecture-based LibGuides
(Weaver, 2011)	2011	2002-10	USA	Morning report	RE	Learning package service
(Santos & Mariano, 2014)	2014	2013	Philippines	Morning rounds	CPE[c]	Consulting, searching and delivering of information resources
(Yaeger & Kelly, 2014)	2014	2012	USA	Patient rounds	RE	Searching and providing evidence for clinical questions
(Zeblisky et al., 2015)	2015	2013-15	USA	EBM conference	RE	Consult searching service

(Herrmann et al., 2017)	2017	2014-15	USA	Patient-family centered rounds	CE[d]	Consulting and delivery searching service
(Blake et al., 2018)	2018	2017	USA	Simulated patient scenarios	UGME	Information service supporting patient-based scenarios designing/ consulting searching service
(Brian et al., 2018)	2018	2016	USA	Inpatient rounds	CE	Consult and delivery information service
(Gillum et al., 2018)	2018	2013-18	USA	Personal librarian program	UGME	Consulting and assisting searching service
(Gibbons & Werner, 2019)	2019	2014-19	USA	Clinical rounds	CE	Real-time clinical searching service

[a] Residency Education, [b] Under-Graduated Medical Education, [c] Continuing Professional Education, [d] Clinical Education

Results

Implementation of a program was defined as developing performing procedures for planned tasks and achieving determined objectives (National Minority AIDS Council, 2015). In this regard, we tried to highlight typical characteristics of implementation trends in EBEIS which were common amongst included studies. After the analysis and comparison of studies, we recognized five oft-mentioned elements of information services implementation trends. In addition, for a better understanding of the implementation process of information services, we summarized the program development process and practical effects of information services.

Program Development of Information Services

Program development has a multi-step process. The main elements of the program development process are required resources for program implementation, program designing, and predefined measures for determining outputs of the program (National Minority AIDS Council, 2015). We determined two elements of program development by comparing the findings of the included studies.

Prerequisites of Programs

One of the prerequisites of using EBEIS is understanding EBM principles. It is essential to ask an evidence based question to receive a relevant response from the information service (Aitken et al., 2011; Brian et al., 2018). It is important to have a librarian present at the point of teaching when the cases are presented. It helps the librarian more quickly and effectively respond to the learners' queries (Aitken et al., 2011; Blake et al., 2018; Gibbons & Werner, 2019;

Herrmann et al., 2017; Yaeger & Kelly, 2014). Other prerequisites for an effective information service are speed of Internet connection and access to evidence based databases. Providing appropriate evidence based information on an educational-clinical question strongly depends on the accessibility of information sources like databases (Santos & Mariano, 2014). In this regard, the availability of infrastructures like a reference-tracker or data repository which deposits data like educational-clinical questions/answers, frequency of responded/non-responded questions, and common clinical patient problems is essential. Deposits of interacted data can be used for subsequent referencing and establishing a database of evidence based educational information for high prevalence clinical disorders (Gillum et al., 2018).

Process of Designing

If an information service is intended to support the evidence based needs of a curriculum, the librarian should consider the structure and needed resources of the curriculum in the design process (Neves & Dooley, 2011). In this regard, surveying the information needs of intended users helped to design the most appropriate services (Zeblisky et al., 2015). The diversity of access channels to information services is an essential factor in the design process. Access via multiple communication channels like email, web, social networks, or face-to-face communication facilitates the use of information services for busy clinicians (Brian et al., 2018).

Implementation Trends of EBEIS

Schedule and Type of Access to Information Services

The schedule of implementing information services strongly depended on the volume of assigned tasks that the librarian had to do alongside the duties of information services. In addition, information services which used telecommunications channels like phone or email (Brian et al., 2018; Gillum et al., 2018; Herrmann et al., 2017; Santos & Mariano, 2014; Weaver, 2011) could provide services during a wider span of time (Table 3).

In the included studies, information services were implemented in different levels of medical education from undergraduate to postgraduate degree programs. In undergraduate medical education, medical students receive the knowledge and skills needed to be a junior doctor. Then, the junior doctor receives more training, especially via clinical education, to gain experience, develop skills for patient care, and prepare for entrance into residency education. This period is considered the internship. Residency education is a period of training to educate competent clinicians in a specific medical specialty such as internal medicine. Internship and residency programs are the two stages of postgraduate medical education. Clinical education provides an opportunity for the trainees to acquire practical skills by rotating between clinical departments of a hospital. Clinical education is an essential part of postgraduate training (Weggemans et al., 2017; Wijnen-Meijer et al., 2013). In addition, the final stage of medical education is continuing professional education (CPE), which promotes lifelong learning for clinicians within their clinical settings. CPE supports clinical skill development of medical doctors and enhances the outcomes of patient treatment (Bennett et al., 2000). CPE programs are delivered via different methods such as rounds, workshops, seminars, conferences, online learning, telemedicine, and other methods.

Medical trainees at the undergraduate and graduate levels receive clinical education in the teaching setting of morning reports and rounds. Morning report is a case-based meeting where medical students and their educators discuss a clinical case related to a patient recently admitted to the teaching hospital (Amin et al., 2000). Rounds or ward rounds are held beside the patient's bed and consist of medical educators and students that listen to the patient

Table 3
Schedule/Access to Information Services

Setting	Type of education	Schedule of implementation	Type of access
Morning report/ rounds/ team conference (Aitken et al., 2011)	RE[a]	10-12 hours per week	Face-to-face
Patient rounds (Yaeger & Kelly, 2014)	RE	Once per week	Face-to-face
Morning rounds (Santos & Mariano, 2014)	CPE[b]	Every working days	Face-to-face/email/ phone
Morning rounds (Santos & Mariano, 2014)	CPE	24 hours/ all days of week	Phone/email
Morning report (Weaver, 2011)	RE	5 days a week	Face-to-face / email
EBM conference (Zeblisky et al., 2015)	RE	Once per month	Face-to-face
Patient-family centered rounds (Herrmann et al., 2017)	CE[c]	Not mentioned	Face-to-face/ email
Clinical rounds (Gibbons & Werner, 2019)	CE	Once a week	Face-to-face
Inpatient rounds (Brian et al., 2018)	CE	Between 3 to 5 days a week	Face-to-face/ email
Personal librarian program (Gillum et al., 2018)	UGME[d]	When the users needed	Face-to-face/ email

[a] Residency Education, [b] Continuing Professional Education, [c] Clinical Education, [d] Under-Graduated Medical Education

and discuss the case of disease presented (O'Hare, 2008).

Methods of Receiving Educational-Clinical Questions

In most of the implementation trends for EBEIS, there is a preference for the presence of a librarian in educational-clinical meetings such as rounds, morning reports, and EBM conferences (Aitken et al., 2011; Brian et al., 2018; Gibbons & Werner, 2019; Herrmann et al., 2017; Santos & Mariano, 2014; Weaver, 2011; Yaeger & Kelly, 2014; Zeblisky et al., 2015). However, some of the information services were provided only virtual, with online chatting as a predefined connection channel between librarians and users. Also, users were able to submit their feedback on the quality of information services via a text box on the web (Neves & Dooley, 2011). Another channel that was provided for receiving educational-clinical queries was an online submission form. Receiving queries online made access to information services easier (Brian et al., 2018).

Types of Delivery of Information Services

The most prevalent type of EBEIS was mediated searching and document delivery based on educational-clinical queries (Aitken et al., 2011; Brian et al., 2018; Gibbons & Werner, 2019; Herrmann et al., 2017; Santos & Mariano, 2014; Weaver, 2011; Yaeger & Kelly, 2014), consulting services for how to formulate a question, and assistance searching the evidence (Blake et al., 2018; Gillum et al., 2018; Herrmann et al., 2017; Santos & Mariano, 2014; Zeblisky et al., 2015).

Table 4
Evidence Based Outputs of Information Services

Reference number	Case presentation	Controlled vocabulary	Key words	Applied search strategy	Search results	Full-text of search results	Abstract of search results	Type of education
(Yaeger & Kelly, 2014)	- [a]	+ [b]	+	+	+	-	-	Residency education
(Santos & Mariano, 2014)	-	-	-	-	-	+	+	Continuing professional education
(Weaver, 2011)	+	-	-	-	+	-	-	Residency education
(Herrmann et al., 2017)	-	-	-	-	-	-	+	Clinical education
(Brian et al., 2018)	-	-	-	-	-	+	-	Clinical education
(Blake et al., 2018)	+	-	-	-	-	-	-	Under-graduate medical education

[a] not-provided, [b] provided

With mediated searching, the librarian received queries, searched appropriate databases, and delivered relevant evidence to the student.

Time of Responding to Queries

The time that it took a librarian to respond to the educational-clinical questions influenced the intended learning of trainees. Some of the information services were designed to provide the needed evidence based information at the educational session itself or on the same day (Aitken et al., 2011; Brian et al., 2018; Gibbons & Werner, 2019; Yaeger & Kelly, 2014). In other studies, the authors did not mention time expectations for receiving answers (Herrmann et al., 2017; Santos & Mariano, 2014; Weaver, 2011). With information services that provided online access to questions and answers, librarians responded to queries in one to three days (Brian et al., 2018).

Providing Evidence Based Outputs

The preparation of evidence based outputs for evidence requests is an essential part of an educational information service. Evidence based output is a document of what a librarian has done to fulfill an evidence request. The evidence based output consists of three distinct parts: a) the clinical case presentation of the patient, b) a record of what keywords and search strategies were used for retrieving evidence, and c) the retrieved search results, which may include the abstracts and full text. Each information service examined presented at least one aspect of the outputs, but a service with all these outputs better supports the educational needs. The purpose of preparing outputs is to provide a documented record for what librarians do, thereby helping trainees and educators learn to better perform their own search for retrieving needed evidence. Preparing an evidence based output for each request of clinical evidence is

time-consuming for the librarian, but educators and learners then have the information documented for further learning and later referrals, as well as evidence based data to deposit in local evidence based databases for future educational purposes (see Table 4).

Effects on Trainee Learning

In the field of medical education, EBEIS enhanced learners' understanding of evidence based practice in medicine (Blake et al., 2018; Brian et al., 2018; Yaeger & Kelly, 2014). After learning about EBM resources (Blake et al., 2018; Brian et al., 2018; Gibbons & Werner, 2019), the evidence retrieval behaviour of medical students shifted to more reliable databases for finding answers to clinical questions (Aitken et al., 2011). The evidence based searching skills of learners were strengthened and learners were able to formulate more meaningful evidence based searches (Brian et al., 2018; Herrmann et al., 2017; Zeblisky et al., 2015). In addition, providing such information services meant learners were supplied up-to-date, high-quality information more quickly (Brian et al., 2018; Gibbons & Werner, 2019), and enhanced the learning process (Gibbons & Werner, 2019). Another practical effect of EBEIS was saving time for learners in finding needed evidence (Herrmann et al., 2017).

Discussion

According to an analysis of the included studies, EBEIS have been implemented in different types of teaching-related units (e.g., teaching hospitals), and in varied target settings (e.g., clinical rounds). In all educational settings, there is a need for learners to access evidence. EBEIS were flexible in servicing different needs within their predetermined teaching programs. In this regard, information services can be implemented in different educational settings with diverse types of access and schedules of service delivery. Consequently, changes in curricula and teaching programs that produce new information needs can be met with reciprocal revisions in the implementation plan of the information services.

It is noteworthy that some of the studied information services had unique procedures in their implementation, which were not executed in the other information services, and therefore were not categorized into identified characteristics as a part of this study. Yaeger and Kelly (2014) stated in their study that a pre-prepared summary of the patient's clinical situation and current clinical management was provided for the librarian ahead of clinical meetings. This procedure helped the librarian to present in the meetings with more confidence, especially for librarians who are new to delivering EBEIS.

In some circumstances, the librarian taught the trainees EBM principles and skills, including understanding and creating PICO questions and designing a search strategy according to the PICO structure, to help accomplish one of the prerequisites of using EBEIS (Aitken et al., 2011; Zeblisky et al., 2015). In this regard, librarians in some of the information services collaborated with teaching teams to prepare educational materials for trainees. In such situations, librarians working in the clinical environment could provide more applicable materials than those excluded from clinical situations (Blake et al., 2018). In this regard, Safdari et al. (2018) found the types of educational roles and activities of health care librarians in teaching information literacy skills and evidence based practice principles to medical students, educators, and clinicians, especially in the location of clinics or via online training. Such educational activities included developing interactive online tutorials, developing video instructions, and co-teaching in medical faculties. Safadari et al. identified librarian participation methods in educational programs that can be considered in the development of EBEIS.

Another unique procedure which supported student learning was assigning a group of

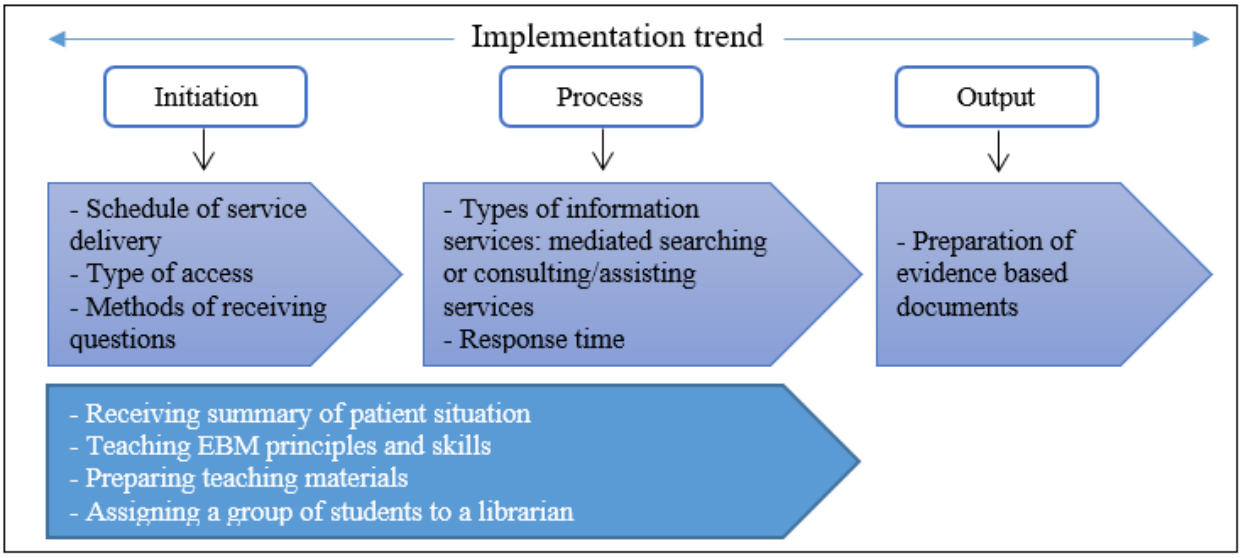

Figure 2
Schematic diagram of implementation characteristics of information services.

trainees with a set number to each librarian. The librarian monitored the students' skill learning according to pre-determined learning objectives, and reciprocally, each student knew which librarian to contact when they encountered a learning problem (Gillum et al., 2018).

Figure 2 presents a schematic diagram of identified characteristics of information services within the sequence of program implementation. Also, we included uncategorized characteristics of information services in the diagram, described in the previous paragraphs.

The main limitation of this study was differentiating between evidence based information services which were designed for clinical practice, medical education, or both simultaneously. In this respect, we tried to include studies which explained the implementation of an information service for supporting evidence for any type of educational procedure.

Conclusion

We conducted this study to identify the structure of the implementation process of information services which supported evidence based medical education. After conducting search strategies in target databases and employing inclusion/exclusion criteria, we selected and analyzed 11 articles. Information services which were studied in this review supported empirical knowledge for evidence based medical education at different levels of training and facilitated evidence based change in educational approaches. The summarized trend of implementing EBEIS consisted of:

(1) schedule and type of access;
(2) methods for receiving questions;
(3) information service types;
(4) response time; and
(5) preparation of evidence based outputs.

On the basis of the implementation trends of information services being studied, an applicable EBEIS based on the needs of each educational level can be designed.

According to the findings of the current review, we propose the following practical recommendations. First, a needs assessment of predefined users is a necessary prerequisite

before designing a practical EBEIS. Based on the characteristics of stakeholders of information services, librarians can benefit from various needs assessment techniques. The characteristics and needs of stakeholders should determine the appropriate assessment technique that results in the most useful data. Second, each educational level needs to have a specifically-designed information service separately. Third, mediated searching can be used for undergraduate levels and consulting information services can be used for graduate or professional levels. Fourth, types of data needed in the evidence based outputs depend on the needs of intended users. Finally, more detailed evidence based outputs will fulfill more educational needs in the future.

It is also plausible to suggest future studies to compare the structure of evidence based information services which support clinical practice with information services that were developed for medical education, in order to identify additional characteristics of implementation trends of evidence based information services.

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Author Contributions

Sedigheh Khani: Conceptualization, Data curation, Methodology, Visualization, Writing – original draft **Sirous Panahi:** Conceptualization, Data curation, Methodology, Writing – review & editing **Ali Pirsalehi:** Conceptualization, Writing – review & editing **Ata Pourabbasi:** Conceptualization, Writing – review & editing

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