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As the dental profession continues to adopt Evidence Based Dentistry (EBD), dental librarians are facing unique opportunities and challenges in their support of EBD education. This study describes the current roles of dental librarians in EBD education including their perceptions of EBD and barriers to their involvement. A web-based survey was distributed to the dental librarians and 71% responded. The results showed that the majority of dental librarians in North America are playing multiple and diverse roles in EBD education. The most frequently cited barrier to their involvement is the low level of interest from the dental faculty/student/school. Most dental librarians felt competent in supporting EBD, although continuing education needs in both EBD and teaching skills were pointed out. In general, dental librarians are eager to support EBD education and they recognize the issues regarding EBD adoption faced by the dental profession.

Headings:

Dental education

Dental librarian

Evidence Based Dentistry (EBD)

Evidence Based Practice (EBP)

Questionnaire

LIBRARIANS' ROLES IN EVIDENCE BASED DENTISTRY EDUCATION IN THE
U.S. AND CANADA

by
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Introduction

In the early 1990s a new paradigm for medical practice emerged, known as Evidence Based Medicine (EBM) (Evidence-Based Medicine Working Group, 1992). EBM has been defined as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients” (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). The former paradigm involved making clinical decisions based on intuition, clinical experience and pathophysiologic rationale, while the new paradigm, EBM, emphasizes using the evidence from medical literature in guiding medical practice (Evidence-Based Medicine Working Group, 1992). As Sackett (1996) pointed out, EBM calls for “both individual clinical expertise and the best available external evidence”, and “neither alone is enough”(Evidence-Based Medicine Working Group, 1992).

The process of EBM includes the following five steps: 1) ask a focused, answerable question derived from the case, 2) search for the evidence in appropriate resources, 3) appraise the evidence for validity, clinical relevance, and applicability, 4) apply the results to practice, and 5) assess the outcome to determine if it is necessary to modify the practice (Cook, Jaeschke, & Guyatt, 1992; Gray & Pinson, 2003;).

McKibbon and Bayley (2004) argued that health sciences librarians can participate in all but the fourth step where clinical expertise is required (McKibbon & Bayley, 2004). A

recent survey by Li and Wu (2009) found that medical librarians in the U.S. have been actively involved in supporting and enhancing EBM as part of their job routine (Li & Wu, 2009).

The concept of EBM has expanded to healthcare disciplines other than medicine, and more inclusive terms such as Evidence Based Healthcare and Evidence Based Practice have been used in the literature. The term “Evidence-Based Practice” was introduced to the National Library of Medicine (NLM) medical subject headings (MeSH) in 2009. The EBM movement has also expanded beyond healthcare. A number of disciplines, such as education (Thomas & Pring, 2004), library science (Eldredge, 2000) and management (Walshe & Rundall, 2001) have also begun to use an evidence based approach in the decision making process, hence the terms Evidence Based Education, Evidence Based Librarianship, and Evidence Based Management.

As part of the EBM movement, the dental profession has also started to adapt Evidence Based Dentistry (EBD) (Dodson, 1997; Ismail & Bader, 2004; Niederman & Badovinac, 1999). In 2001, EBD was defined by the American Dental Association (ADA) as “an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to the patient's oral and medical condition and history, with the dentist's clinical expertise and the patient's treatment needs and preferences” (Hutter, 2004). Just as EBM requires physicians to acquire new skill sets such as accessing, searching and appraising the clinical literature (Evidence-Based Medicine Working Group, 1992), EBD requires such new skills for dentists. Since most dentists were not taught the skills and tools of EBD in dental school (Chiappelli et al., 2003), a variety of barriers exist for dentists who wish to

implement EBD in their routine practice (Hannes, Norre, Goedhuys, Naert, & Aertgeerts, 2008; Iqbal & Glenny, 2002). The importance of EBD education has been raised in an editorial of *Evidence-based Dentistry* (Richards, 2006).

The fact that dentistry is lagging behind in adopting EBD provides dental librarians with unique opportunities and challenges in supporting EBD education and implementation. However, so far there is no empirical study in the literature exploring the current status of dental librarians' perception and knowledge about EBD and their involvement in EBD education. To bridge this knowledge gap, the current study was designed to conduct a confidential online survey of academic librarians who serve dental programs in North America.

Literature Review

Evidence Based Medicine and Librarians' Roles

As early as 1994, Haines (1994) pointed out in a *Health Libraries Review* editorial that the new opportunities for health sciences librarians in the time of paradigm shift in medical practice (Haines, 1994). She argued that librarians should not be content to “play only a supporting role” in EBM and should be more assertive about the value of their work (Haines, 1994). Similarly, Rose (1998) stressed in a review article that librarians should market the value of their roles in the movement towards EBM (Rose, 1998). McCarthy (1996) described how EBM had extended librarians' role beyond expert searchers to involvement in teaching and training information retrieval (McCarthy, 1996). Eldredge (2000) wrote that librarians' roles in EBM were mainly in the second step of the five-step process of EBM, which was to search for the evidence in appropriate resources (Eldredge, 2000). However, McKibbon and Bayley (2004) drew upon their own professional experience at McMaster University, a world pioneer in EBM, and argued that librarians can participate in all but the fourth step, where clinical expertise is required. The authors further emphasized that librarians can become partners in EBM education for students in the health disciplines (McKibbon & Bayley, 2004). Scherrer (1999) commented that health sciences librarians' role in EBM had evolve “beyond

identification of the literature to involvement in practicing and teaching quality filtering and critical appraisal of the literature” (Scherrer & Dorsch, 1999).

Recently, Perry and Kronenfeld (2005) suggested that librarians should be on the cutting edge of advanced information management technology and should play a role in the development and dissemination of secondary, evidence based digital knowledge resources and services (Perry & Kronenfeld, 2005). Although Rose also mentioned the librarians’ role as “organizer and disseminator of secondary sources of information” as early as 1998 (Rose, 1998), Perry and Kronenfeld (2005) apparently took the idea a step further by emphasizing the development of clinical knowledge management infrastructure rather than the mere complication of Web-based guides of EBM (Perry & Kronenfeld, 2005).

In addition to the advocacy articles cited above and a number of individual case reports on health sciences librarians’ involvement in EBM, such as (Brahmi, London, Emmett, Barclay, & Kaneshiro, 1999; Brown & Nelson, 2003; Geyer & Irish, 2008), there have been relatively few empirical studies dealing with how the library profession is currently involved in supporting EBM. Pappas (2008) recently surveyed all members of the Hospital Libraries Section (HLS) of the Medical Library Association (MLA) to examine members’ perceptions of the skills needed to support EBM (Pappas, 2008). The results indicated that lack of time was the major barrier to hospital librarians’ involvement in EBM. The author also found that most participants had taken formal EBM classes, and that it was mostly nurses who initiated the request to conduct EBM literature searches (Pappas, 2008). More recently, at the 37th Annual Conference of the Canadian Association for Information Science (CAIS/ACSI) Conference, Li and Wu

(2009) presented the results of their survey of medical librarians in academic libraries, hospital libraries, and special libraries in the U.S. (Li & Wu, 2009). Li and Wu's results showed that U.S. medical librarians have been taking on various roles in supporting and enhancing EBM practice both on a routine basis and on a project oriented basis. While hospital librarians are the most active in providing EBM related services such as providing EBM searches, academic medical librarians are especially active in teaching EBM (Li & Wu, 2009).

Evidence Based Dentistry and Librarians' Roles

Since EBM has been conceptually expanded to other healthcare professions, dental librarians have also started to embrace the opportunities and challenges in supporting EBD. Levine (2008) reported the successful development of an interdisciplinary course at the University of Texas Health Science Center at Houston Dental Branch where librarians participated in the designing process and in teaching dental students EBD (Levine, Bebermeyer, Chen, Davis, & Harty, 2008). Maggio and Jeffery (2008) reported active and diverse roles of librarians in teaching EBD (Maggio & Jeffery, 2008). Working closely with the dental faculty, medical librarians at Boston University purchased new materials to support the course, built an EBD tutorial, and created online assignment submission systems. Furthermore, librarians provided a short hands-on training session for the faculty before they taught students (Maggio & Jeffery, 2008). Librarians' roles in EBD education have also been reported by dental faculty. For example, in an article outlining methods and resources useful to teaching EBD in dental schools, Anderson (2008) drew upon his own experience in teaching EBD courses and

specifically emphasized the value of librarians and the library in EBD education (Anderson, 2008).

Dental librarians Facing Unique Opportunities and Challenges

The reported roles of dental librarians in EBD are basically similar to those of medical librarians in supporting EBM. However, additional opportunities and challenges exist for dental librarians to support EBD education and implementation due to the fact that the implementation of EBD in dental practice has been slow in spite of the profession's advocacy (Kao, 2006).

A variety of barriers to implementing EBD have been identified in empirical studies (Hannes et al., 2008; Iqbal & Glenn, 2002) and speculated about in opinion articles (Kao, 2006; McGlone, Watt, & Sheiham, 2001). Lack of knowledge of EBD was reported as one of barriers in both a survey study and a focus group study (Hannes et al., 2008; Iqbal & Glenn, 2002). Meanwhile, it was pointed out in a guest editorial in *Journal of Dental Research* that "most dentists were not taught the skills and tools of evidence-based dentistry in dental school" (Chiappelli et al., 2003). Although the barriers for dentists in implementing EBD may not be addressed by EBD education alone (Kao, 2006; McGlone et al., 2001), the importance of teaching dental students the key skills required to practice EBD was emphasized in an editorial of *Evidence-based Dentistry* (Richards, 2006). With the continuous evolution of EBD, EBD education has been included in formal educational programs and has made significant progress in predoctoral education (Campbell, 2009). According to Campbell's (2009) article, while most U.S. dental schools (88%) currently teach their graduating students the basic principles of

EBD, only 55% of the dental schools have completely integrated the EBD principles into their entire curricula (Campbell, 2009). The lack of integration of EBD across the curriculum has been recognized as a challenge facing dental education (Richards, 2006).

Importance of Study

Dental librarians are presented with unique opportunities and challenges in support of dental education to prepare a new generation of dentists with the knowledge and skills to implement EBD. However, so far there have been no empirical studies conducted to explore the current status of dental librarians' roles in EBD education. The current study aims to describe dental librarians' perceptions of EBD and to describe if and how they are involved in EBD education by conducting a survey among dental librarians who serve dental programs in the U.S. and Canada.

Results from this survey are relevant to both to the library and dentistry professions. First, by examining the challenges and barriers faced by dental librarians in supporting EBD, this study helps to identify education needs of library and information science students and continuing education needs of dental librarians. Second, the perception and experience of dental librarians on EBD education provides the dentistry profession with insights into EBD education and how librarians' expertise can help.

Methods

A confidential online survey methodology of dental librarians in the U.S. and Canada was approved by the University of North Carolina at Chapel Hill (UNC-CH) Institutional Review Board (IRB). The survey methodology included recruiting subjects, designing and pretesting the questionnaire, distributing the questionnaire, and data analysis.

Recruiting Subjects

The target population of this survey is academic librarians who serve DDS (Doctor of Dental Surgery) or DMD (Doctor of Dental Medicine) programs in the U.S. and Canada. Both DDS and DMD degrees use the same curriculum requirements set. The term DDS is used hereafter to refer to both degrees. The American Dental Association website (<http://www.ada.org/267.aspx>) provides a list of all the accredited DDS programs in the U.S., which are located in 58 different institutions. The Commission on Dental Accreditation of Canada website (http://www.cdac.ca/cdacweb/en/search_for_accredited_programs/) lists all the accredited DDS programs in Canada, which are located in 10 different institutions. The official Wiki of the Medical Library Association (MLA) Dental Section (<http://mladentalsection.pbworks.com/Dental-Libraries>) provides a directory of dental librarians from the 57 out of the 58 institutions in U.S. and all the 10 institutions in

Canada. Therefore, using the contact information provided by MLA dental section is sufficient to reach the majority of participants of interest. For most of the institutions, only one dental librarian is listed in the directory provided by MLA Dental Section. Two institutions have two dental librarians listed respectively, and the first listed one was contacted. Kate McGraw, who is the Dental Librarian at the UNC-CH Health Sciences Library, was excluded from the study because of her role in recruiting participants and pretesting survey questionnaire (see below). At this point, there were a total of 66 potential participants.

Considering the small size of the population of interest, no sampling was conducted. Various means were used to achieve a high response rate. A pre-notification email message ([Appendix B](#)) was sent to all the potential participants by McGraw, who is an active member of the MLA Dental Section and served as the Chair in 2008-2009. A number of potential participants showed immediate enthusiasm about this survey based on the pre-notification email messages. Ten email messages were bounced back. By visiting each library's website, the researcher was able to identify the current contact information for all but one of the dental librarians. In the end, 65 potential participants were identified for survey distribution with 10 in Canada and 55 in the U.S.

Designing and Pretesting Survey

A questionnaire (see the [Appendix A](#)) with a total of 14 multiple-choice questions and one open-ended question was developed specifically for this study. Question categories included basic work experience, involvement in EBD education, and training

on and perceptions of EBD. The questionnaire was pretested before distribution by McGraw, Joanne Marshall and Connie Schardt.

Distributing Survey

The online questionnaire was programmed and administered by using Qualtrics survey software (Provo, UT). By using the Survey Mailer feature of Qualtrics, a unique survey URL was sent to each potential participant. Invitation email messages ([Appendix C](#)) were then sent to an updated list of potential participants one day after the pre-notification messages were sent. A week later, email reminders were sent to those who had not responded. Five days later (two days before closing the survey), final email reminders were sent out with a specific deadline. During this process, thank-you email messages were sent to those who had participated.

Data Analysis

Qualitative data for multiple-choices questions was automatically generated by Qualtrics. Content of responses to the open-ended question and text entries for some of the multiple-choices questions was analyzed and categorized into appropriate topics, such as roles in teaching EBD, roles in other EBD services, and barriers to EBD involvement

Results

Survey Response Rate

Forty-six out of 65 dental librarians participated in the survey, yielding a response rate of 71%. These participants came from 46 different institutions, which constituted 79% of all the institutions in the U.S. and Canada offering the DDS program. Thirty-nine participants were from U.S. institutions, while seven were from Canadian institutions.

Participant Background

More than half (57%, n=26/46) of the participants have worked in their current libraries for 11 or more years (Figure 1). Eight (17%) participants reported 6-10 years, five (11%) reporting 3-5 years, and seven (15%) reported two years or less (Figure 1). The majority (91%, n=42/46) noted that they served as the primary contact librarians for other programs besides DDS programs, while four participants served as the primary contact librarians for DDS programs only.

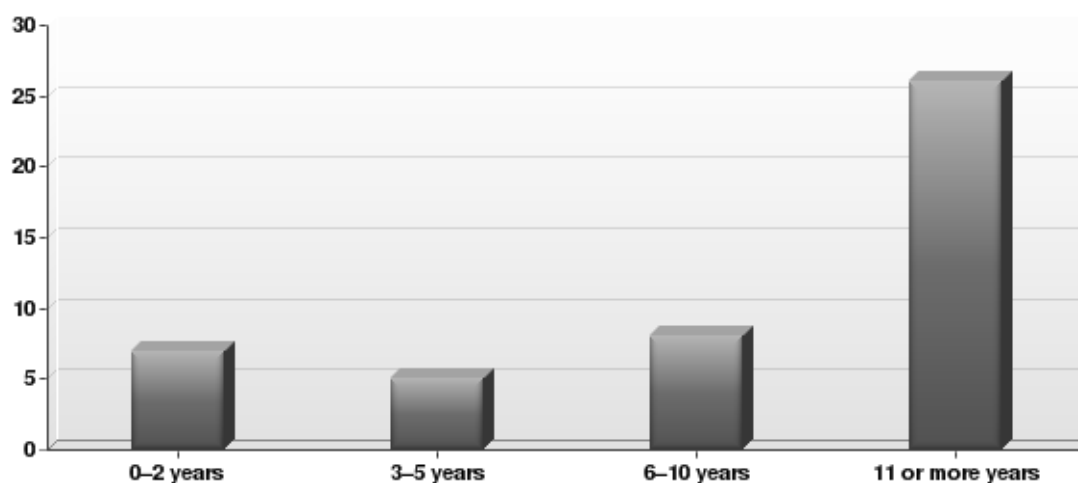


Figure 1 Participants' years of experience working in their current library. Note: see Appendix A for the questionnaire with fulltext of response categories.

EBD Educational Opportunities for DDS Students

Forty-four out of 46 participants responded to the question on the availability of EBD educational opportunities for DDS students in their institution. The most frequently cited opportunity was “the principles of EBD are integrated throughout an entire curriculum” (52%, n=23/44), while the least cited opportunity was standalone courses with five respondents reporting “standalone for credit courses” and one respondent reporting “standalone non-credit courses” (Figure 2). When asked if students were required to take the standalone courses, all of the 6 respondents answered yes. “Individual classes” was cited by 32% of the respondents (n=14/ 44). “Other (please specify)” was also cited by 32% of the respondents, but only one new educational opportunity was identified after content analysis: online resources created and/or provided by the libraries.

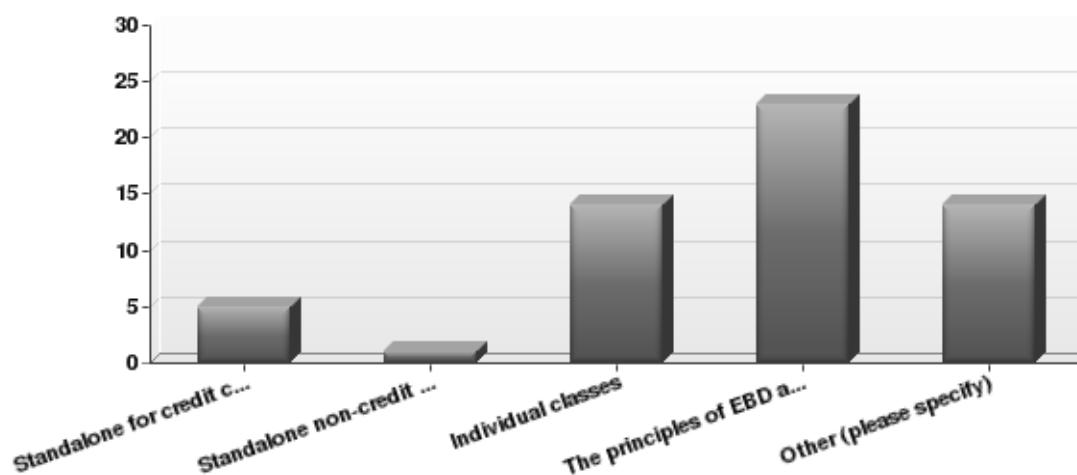


Figure 2 EBD educational opportunities for DDS students. Note: see Appendix A for the questionnaire with fulltext of response categories.

Roles in Teaching DDS Students EBD Courses

The majority (72%, n=33/46) of the participants indicated their involvement in teaching DDS students EBD courses. The most frequently cited role was “teaching students EBD literature searching skills” (97%, n=32/33), followed closely by “offering students individual or group consultations upon request” (88%, n=29/33) (Figure 3). Roles that were also heavily cited included “training dental faculty on EBD literature searching” (58%, n=19/33), “purchasing new materials to support the course” (55%, n=18/33), “developing/ maintaining course-tailored instructional materials” (48%, 16/33), and “designing or helping design course materials” (42%, n=14/33) (Figure 3). One participant also reported the role of encouraging “use of mediated library services as learning opportunity for developing search skills”.

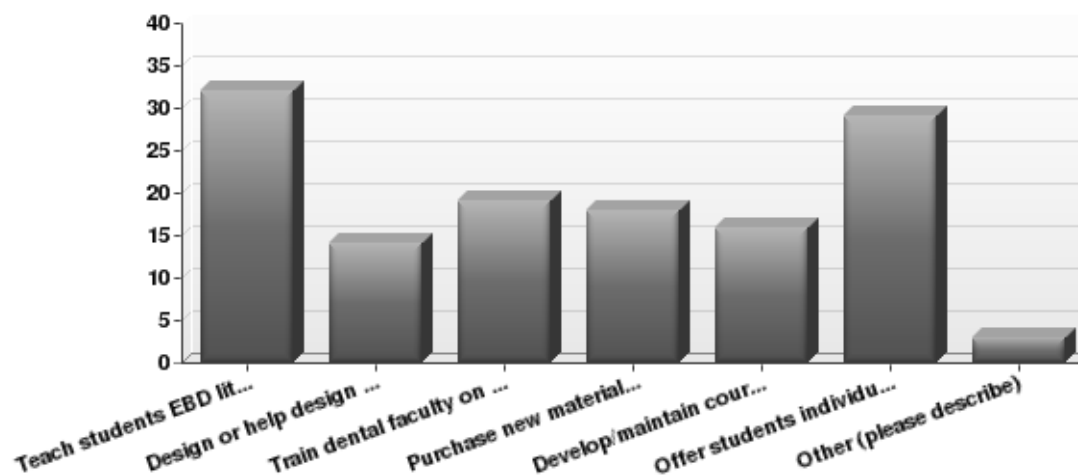


Figure 3 Librarians' roles in teaching DDS students EBD courses. Note: see Appendix A for the questionnaire with fulltext of response categories.

Involvement in other EBD Services

Forty-five out of 46 participants responded to the question on providing other services related to EBD besides teaching DDS students EBD courses. The two most frequently cited services were “offering dental students consultations on EBD literature searching skills upon request” (89%, n=40/45) and “offering dental faculty consultations on EBD literature searching skills upon request” (87%, n=39/45) (Figure 4).

Approximately half of the respondents cited “developing/ maintaining instructional materials” (51%, n=23/45) and “offering workshops or short classes on EBD literature searching skills” (44%, n=20 /45) (Figure 4). Five participants indicated no involvement in EBD services other than teaching EBD courses (Figure 4). EBD related services reported by respondents included 1) conducting EBD searches upon request, 2) serving

on thesis committee, and 3) maintaining an “archive of selected examples of dental systematic review searches on common topics”.

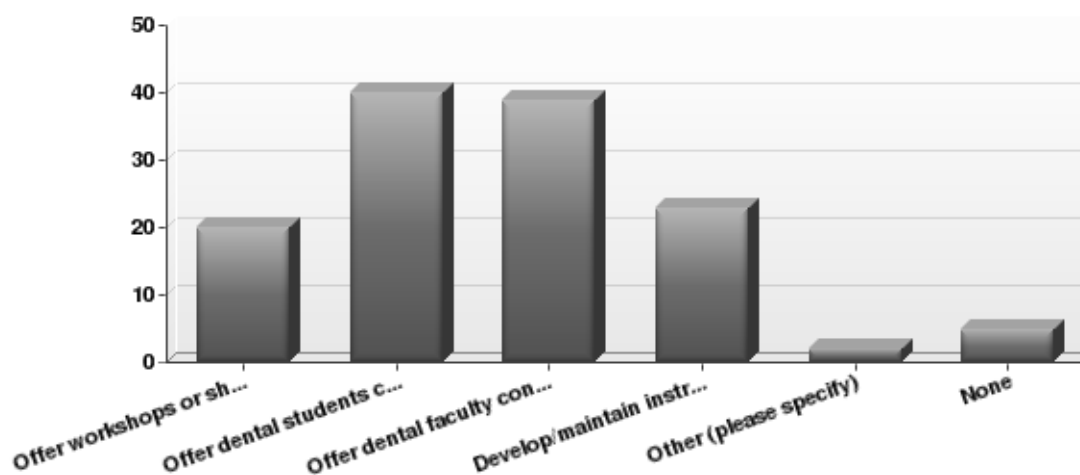


Figure 4 Librarians’ involvement in EBD services besides teaching EBD courses.
Note: see Appendix A for the questionnaire with fulltext of response categories.

Frequency of Assisting EBD Literature Searching

More than half (52%, n=24/46) of the respondents reported they assisted DDS students with EBD literature searching at least once or twice a year, 11 respondents reported at least once or twice a month, and 3 respondent reported at least once or twice a week. Seven respondents reported they had never assisted dental faculty with EBD literature searching. Similarly, more than half (57%, n=26/46) of the respondents reported they assisted dental faculty with EBD literature searching at least once or twice a year, 10 respondents reported at least once or twice a month, and one respondent reported at least

once or twice a week. Nine respondents reported they had never assisted dental faculty with EBD literature searching.

Competency in Providing EBD Services

The majority felt competent in providing EBD services (89%, n=41/46). All of those who did not feel competent noted that they did not have much hands-on experience in providing such services.

Methods to Gain EBD Knowledge

Forty-four out of 46 participants answered the question on the methods used to gain EBD knowledge. The most frequently cited method was self-instruction (93%, n=41/44) (Figure 5). The second most frequently cited method was conference programs (61%, n=27/44), followed closely by workshops (57%, n=25/44), in-service training (48%, n=21/44) (Figure 5). Medical Library Association (MLA) Continuing Education was cited by 13 participants, and library school program was cited once. Several participants noted that colleagues, mentors, or health sciences librarians were great sources of EBD knowledge. Other sources of EBD knowledge indicated by participants included Canadian Health Libraries Association (CHLA) Continuing Education and American Dental Association (ADA) website.

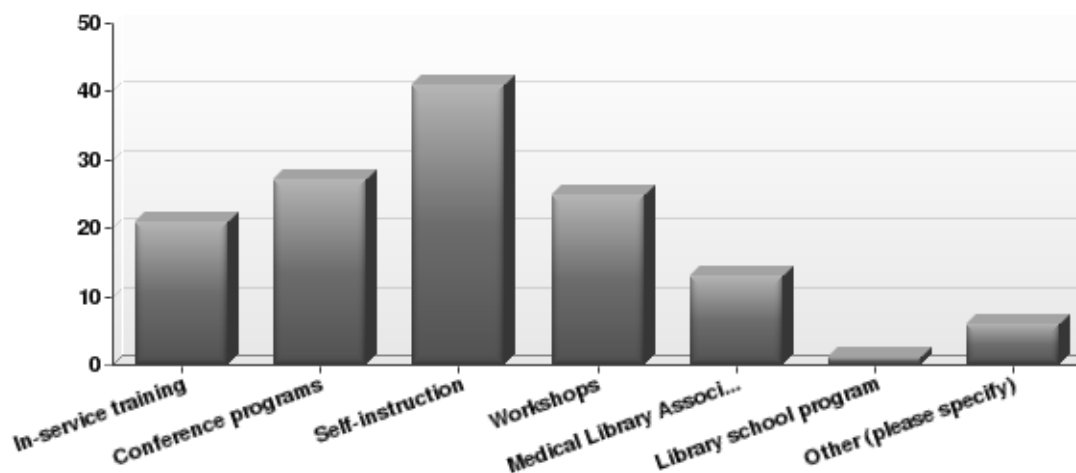


Figure 5 Librarians' methods to gain EBD knowledge. Note: see Appendix A for the questionnaire with fulltext of response categories.

Barriers to Librarians' Involvement in EBD Education

Lack of interest from dental students

Forty-five out of 46 participants answered the question on the barriers to their desired level of involvement in EBD education with one stating desired level of involvement was reached and the rest citing at least one barrier. The most frequently cited barrier was “not enough interest from the dental school or dental faculty” (64%; n= 29 /45) (Figure 6). This point of view was elaborated by two out of the 11 participants who responded to the open-ended question at the end of the survey. Both respondents pointed out the challenge of showing dental students how EBD will benefit their future private practice and how it fits into their business models.

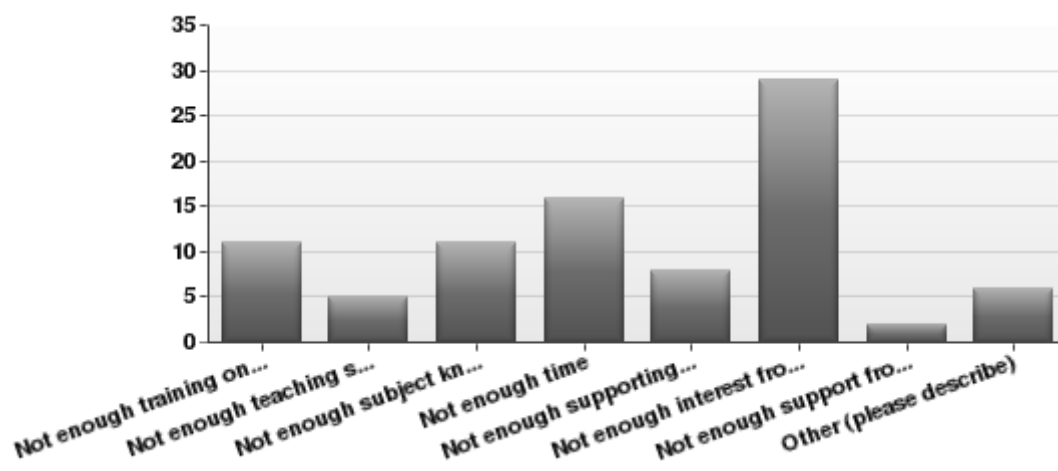


Figure 6 Barriers to librarians' involvement in EBD education. Note: see Appendix A for the questionnaire with fulltext of response categories.

Lack of training on EBD skills

“Not enough time” “not enough subject knowledge”, and “not enough training on EBD” were also indicated by more than 10 respondents (Figure 6). The need of EBD training was also noted by two out of the 11 participants who responded to the open-ended question at the end of the survey. In particular, MLA was called for in its potential roles in advocating EBD and supporting EBD continue education.

Lack of teaching skills

“Not enough teaching skills” was cited as a barrier by five participants (11%) (Figure 6). One respondent elaborated in the final open-ended question that teaching had become “a primary focus” of librarians, and library schools needed to adjust their curriculum to better prepare their students in this role.

Crowded dental curriculum

The challenge of integrating EBD into the already crowded dental curriculum was specified as a barrier by three participants. Similar comments were made by two participants in the final open-ended question.

Other barriers

Other barriers, such as “not enough support from library administrator in professional development”, and “not enough supporting staff”, were cited by several respondents (Figure 6).

Perceptions of EBD

In the final open-ended question, widespread appreciation and enthusiasm toward EBD was expressed by the dental librarians. One participant expressed satisfaction with the current status of EBD education in the program he/she worked with, i.e. EBD was integrated into the curriculum and patient care. In addition to recognizing the barriers mentioned above, one of the participants commented that while the dental profession has started move toward EBD, “it needs to foster the development of more effective research to strengthen the evidence base and must learn how to develop secondary sources built around how dentist actually practice”.

Discussion

There are 58 institutions in U.S. and 10 institutions in Canada that offer the DDS programs. Participants in this study were from 46 different institutions with 39 in the U.S. and 7 in Canada, so the findings in the study can be considered representative of dental librarian profession in North America.

Most of the participants have a number of years' library experience and also serve programs other than the DDS program. The majority participants felt competent in providing EBD services, and most are playing multiple and diverse in support of EBD education. The majority participate in EBD education, especially by teaching D.D.S. students EBD literature searching skills during EBD courses. Besides this teaching role, dental librarians are also taking other roles including providing students with individual assistance, providing collection development support, developing instructional materials, and promoting use of library resources. Meanwhile, most dental librarians are also involved in providing EBD related services beyond the EBD courses. In particular, they provide dental students and faculty with consultations on EBD literature searching skills upon request.

Obstacles to the implementation of Evidence Based Practice in the allied health professions have been discussed by health sciences librarians in a review article by Kronenfeld (2007). It is not clear how dental librarians perceive the barriers to their support of EBD and the barriers to the adoption of EBD in the dental profession. The

current study found that “not enough interest from the dental school or dental faculty” was the most cited barrier to dental librarians’ desired level of involvement in EBD education. This low level of interest from dental students/faculty could potentially explain the low demand of EBD consultation requests indicated by the consultation frequency reported by dental librarians. Although providing individual consultation upon request was cited by almost 90% of the participants, the most reported frequency was “at least once or twice a year”. Meanwhile, when asked the reason for lack of competency in providing EBD services some participants indicated they did not have many hands-on opportunities with EBD since EBD had not been introduced to the dental curriculum yet.

Various obstacles to the adoption of EBD by dentists have been discussed in the dental profession (Chiappelli et al., 2003; Hannes et al., 2008; Iqbal & Glenny, 2002; Kao, 2006), among which are the lack of high-quality evidence from high-quality dental clinical trials (Innes, Evans, Clarkson, & Foley, 2005) and the lack of secondary tools for practicing dentist to evaluate the literature (Chiappelli & Prolo, 2002). One of the participants touched specifically on these two issues in the open-ended question, suggesting that dental librarians are well-versed in recognizing the needs and concerns in the dental profession. Heavy workload in dentistry was one of the obstacles reported by Hannes (2008). Similarly, several participants perceived the already crowded dental curriculum as a barrier. The dental literature has recognized that lack of integration of EBD across the curriculum as a challenge facing dental education. Campbell (2009) cited that 55% of the dental schools have completely integrated the EBD principles into their entire curricula (Campbell, 2009). According to this survey, about half of the participants

(52%) reported that the principles of EBD were integrated across the entire curriculum in their institution, largely confirming Campbell's (2009) data.

The survey results pointed to a need for EBD continuing education for dental librarians. One area of training need is in EBD itself. EBM requires that both health care providers and librarians acquire new knowledge and develop new skills (Scherrer & Dorsch, 1999). Several participants in the current study felt the Evidence Based Medicine course offered through the School of Information and Library Science at UNC-CH was not enough (for details about this course, see Appendix F. Evidence Based Medicine Training Resources for Librarians), and MLA need to provide additional training opportunities. Another participant also touched on the challenge of developing dentistry-related examples when he/she tried to draw upon his/her knowledge in EBM.

The other area of training need is in teaching skills and methodology. In their report on librarians' role in EBD, Maggio and Jeffery (2008) mentioned that librarians in the Alumni Medical Library at Boston University collaborated with Center for Excellence in Teaching to sharpen their teaching skills (Maggio & Jeffery, 2008). One participant in this study indicated the library and information science school curriculum need to reflect the growing roles of librarians in teaching. Petrinic (2007) also made similar suggestion based on the findings in her recent study on the education and training needs of health librarians (Petrinic & Urquhart, 2007).

Limitations

This study has several limitations. A limitation present in all survey studies is that the results are based on self-reporting. While dental librarians are in the best position to examine their own involvement in EBD education, it would be desirable to see how dental students and dental faculty perceive librarians' roles in EBD education. Further studies can be conducted to examine the knowledge and perceptions of dental faculty (e.g. the dean of the dental school) regarding EBD and librarians' roles in EBD education. Secondly, the multiple-choice questions can be less demanding on the participants' time, but the listed items could potentially restrain participants' thinking processes. When applicable, an option allowing text entry was provided. The open-ended question at the end of the survey was also intended to offer participants the chance to express anything they felt were left out in previous questions.

Conclusion

Forty-six dental librarians from 46 different institutions in the U.S. and Canada participated in this study. This survey results showed despite of the low level of interest from some of the dental schools/students, dental librarians in the U.S. and Canada are enthusiastic towards supporting EBD. In most institutions, they are playing multiple and diverse roles in EBD education and other EBD related services and feel competent in these roles. Dental librarians are also well aware of the challenges in support of EBD and are eager to obtain more training required for their roles in EBD education. Potential training opportunities on EBD and teaching skills can be addressed by the library schools and professional associations of health sciences librarians.

References

- Anderson, G. C. (2008). Dissemination tools and resources: Assisting colleagues in the implementation and promotion of EBD principles. *Journal of Evidence Based Dental Practice*, 8(3), 155-158.
- Brahmi, F. A., London, S. K., Emmett, T. W., Barclay, A. R., & Kaneshiro, K. N. (1999). Teaching life-long learning skills in a fourth-year medical curriculum. *Medical Reference Services Quarterly*, 18(2), 1-11.
- Brown, J. F., & Nelson, J. L. (2003). Integration of information literacy into a revised medical school curriculum. *Medical Reference Services Quarterly*, 22(3), 63-74.
- Campbell, S. D. (2009). Learning from the present to educate the future: Dental education and EBDM. *The Journal of Evidence-Based Dental Practice*, 9(3), 154-157.
- Chiappelli, F., & Prolo, P. (2002). Evidence-based dentistry for the 21st century. *General Dentistry*, 50(3), 270-273.
- Chiappelli, F., Prolo, P., Newman, M., Cruz, M., Sunga, E., Concepcion, E., & Edgerton, M. (2003). Evidence-based practice in dentistry: Benefit or hindrance. *Journal of Dental Research*, 82(1), 6-7.
- Cook, D. J., Jaeschke, R., & Guyatt, G. H. (1992). Critical appraisal of therapeutic interventions in the intensive care unit: Human monoclonal antibody treatment in

- sepsis. journal club of the hamilton regional critical care group. *Journal of Intensive Care Medicine*, 7(6), 275-282.
- Dodson, T. B. (1997). Evidence-based medicine : Its role in the modern practice and teaching of dentistry. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 83(2), 192-197.
- Eldredge, J. D. (2000). Evidence-based librarianship. *Medical Reference Services Quarterly*, 19(3), 1-18.
- Evidence-Based Medicine Working Group. (1992). Evidence-based medicine. A new approach to teaching the practice of medicine. *JAMA : The Journal of the American Medical Association*, 268(17), 2420-2425.
- Geyer, E. M., & Irish, D. E. (2008). Isolated to integrated: An evolving medical informatics curriculum. *Medical Reference Services Quarterly*, 27(4), 451-461.
- Gray, G. E., & Pinson, L. A. (2003). Evidence-based medicine and psychiatric practice. *Psychiatric Quarterly*, 74(4), 387.
- Haines, M. (1994). Evidence-based practice: New opportunities for librarians. *Health Libraries Review*, 11(4), 221-225.
- Hannes, K., Norre, D., Goedhuys, J., Naert, I., & Aertgeerts, B. (2008). Obstacles to implementing evidence-based dentistry: A focus group-based study. *Journal of Dental Education*, 72(6), 736-744.
- Hutter, J. W. (2004). The history of evidence-based dentistry in the ADA. *Journal of Evidence Based Dental Practice*, 4(1), 8-11.

- Innes, N. P., Evans, D. J., Clarkson, J. E., & Foley, J. I. (2005). Obtaining an evidence-base for clinical dentistry through clinical trials. *Primary Dental Care : Journal of the Faculty of General Dental Practitioners (UK)*, 12(3), 91-96.
- Iqbal, A., & Glenny, A. M. (2002). General dental practitioners' knowledge of and attitudes towards evidence based practice. *British Dental Journal*, 193(10), 587-91; discussion 583.
- Ismail, A. I., & Bader, J. D. (2004). Evidence-based dentistry in clinical practice. *Journal of the American Dental Association (1939)*, 135(1), 78-83.
- Kao, R. T. (2006). The challenges of transferring evidence-based dentistry into practice. *Journal of the California Dental Association*, 34(6), 433-437.
- Kronenfeld, M., Stephenson, P. L., Nail-Chiwetalu, B., Tweed, E. M., Sauers, E. L., McLeod, T. C. V., Guo, R., Trahan, H., Alpi, K. M., & Hill, B. (2007). Review for librarians of evidence-based practice in nursing and the allied health professions in the united states. *Journal of the Medical Library Association: JMLA*, 95(4), 394.
- Levine, A. E., Bebermeyer, R. D., Chen, J. W., Davis, D., & Harty, C. (2008). Development of an interdisciplinary course in information resources and evidence-based dentistry. *Journal of Dental Education*, 72(9), 1067-1076.
- Li, P., & Wu, L. (2009). Exploring the real world: Medical librarians' involvement in supporting evidence-based medicine (EBM) practice. Paper presented at the 37th Annual CAIS/ACSI Conference. Retrieved from http://www.cais-acs.ca/proceedings/2009/Li_Wu_2009.pdf
- Maggio, L. A., & Jeffery, K. M. (2008). Helping a dental school put the "e" in evidence-based dentistry. *Journal of the Medical Library Association : JMLA*, 96(2), 152-155.

- McCarthy, L. H. (1996). Evidence-based medicine: An opportunity for health sciences librarians. *Medical Reference Services Quarterly*, 15(4), 63-71.
- McGlone, P., Watt, R., & Sheiham, A. (2001). Evidence-based dentistry: An overview of the challenges in changing professional practice. *British Dental Journal*, 190(12), 636-639.
- McKibbin, K., & Bayley, L. (2004). Health professional education, evidence-based health care, and health sciences librarians. *Reference Services Review*, 32(1), 50-53.
- Niederman, R., & Badovinac, R. (1999). Tradition-based dental care and evidence-based dental care. *Journal of Dental Research*, 78(7), 1288-1291.
- Pappas, C. (2008). Hospital librarians' perceptions related to evidence-based health care. *Journal of the Medical Library Association: JMLA*, 96(3), 235.
- Perry, G. J., & Kronenfeld, M. R. (2005). Evidence-based practice: A new paradigm brings new opportunities for health sciences librarians. *Medical Reference Services Quarterly*, 24(4), 1.
- Petricic, T., & Urquhart, C. (2007). The education and training needs of health librarians--the generalist versus specialist dilemma. *Health Information and Libraries Journal*, 24(3), 167-176.
- Richards, D. (2006). Evidence-based dentistry--a challenge for dental education. *Evidence-Based Dentistry*, 7(3), 59. doi:10.1038/sj.ebd.6400420
- Rose, S. (1998). Challenges and strategies in getting evidence-based practice into primary health care--what role the information professional? *Health Libraries Review*, 15(3), 165-174.

Sackett, D. L., Rosenberg, W., Gray, J., Haynes, R. B., & Richardson, W. S. (1996).

Evidence based medicine: What it is and what it isn't. *British Medical Journal*, 312(7023), 71.

Scherrer, C., & Dorsch, J. (1999). The evolving role of the librarian in evidence-based medicine. *Bulletin of the Medical Library Association*, 87(3), 322.

Thomas, G., & Pring, R. (2004). *Evidence-based practice in education* Open University Press.

Walshe, K., & Rundall, T. G. (2001). Evidence-based management: From theory to practice in health care. *The Milbank Quarterly*, 79(3), 429-457.

Appendix

Appendix A. Librarians' Roles in Evidence Based Dentistry Survey

Welcome to the Librarians' Roles in Evidence Based Dentistry Survey! First, we will ask you 2 questions on your own background.

How long have you been working in your current library?

- 0–2 years
 3–5 years
 6–10 years
 11 or more years

Do you also currently serve as the primary contact librarian for other programs within your institution?

- Yes
 No

Now we will ask you some questions about your involvement in Evidence Based Dentistry (EBD) education.

Which of the following EBD educational opportunities are available for DDS students in your institution?

- Standalone for credit course
 Standalone non-credit course
 Individual classes
 The principles of EBD are integrated throughout an entire curriculum
 Other (please specify)

Are the DDS students in your institution required to take the standalone EBD course?
(Note: by using the skip logic feature in Qualtrics, this question only appears when a participants check “standalone for credit course” and/or “standalone non-credit course” in the previous question.)

- Yes
 No
 Do not know

Are you involved in teaching EBD to DDS students in your institution?

Yes

No

What are your roles in teaching EBD to dental students in your institution? Please select all that apply.

(Note: by using the skip logic feature in Qualtrics, this question only appears when a participant answers yes in the previous question)

Teach students EBD literature searching skills

Design or help design course syllabus

Train dental faculty on EBD literature searching

Purchase new materials to support the course

Develop/maintain course-tailored instructional materials

Offer students individual or group consultations upon request

Other (please describe)

Do you provide any other services related to EBD? Please select all that apply.

Offer workshops or short classes on EBD literature searching skills

Offer dental students consultations on EBD literature searching skills upon request

Offer dental faculty consultations on on EBD literature searching skills upon request

Develop/maintain instructional materials

Other (please specify)

None

How often do you assist DDS students with EBD literature searching?

Never

At least once or twice a year

At least once or twice a month

At least once or twice a week

More often than once or twice a week

How often do you assist dental faculty with EBD literature searching?

Never

At least once or twice a year

At least once or twice a month

At least once or twice a week

Do you feel competent providing EBD-related services?

Yes

No (If no, please provide reasons)

Finally, we will ask you some questions about your training and perspectives on Evidence Based Dentistry (EBD).

What method have you used to gain knowledge on EBD? Please select all that apply.

- In-service training
- Conference programs
- Self-instruction
- Workshops
- Medical Library Association (MLA) Continuing Education
- Library school program
- Other (please specify)

Please indicate which of the following pose barriers to your desired level of involvement in EBD education in your institution. Please select all that apply.

- Not enough training on EBD
- Not enough teaching skills
- Not enough subject knowledge
- Not enough time
- Not enough supporting staff
- Not enough interest from the dental school or dental faculty
- Not enough support from library administrator in professional development
- Other (please describe)

Please add any additional comments of librarians' involvement in EBD education, e.g. importance, future directions, educational needs, etc.

Appendix B. Pre-notification Email for EBD Survey

Dear %%firstname%%,

I'm writing to ask you to participate in a research study of librarians' roles in evidence based dentistry (EBD) education. You will hear more about this research study soon from Xiaomei Gu, who is currently pursuing her MSLS degree at the School of Information and Library Science at University of North Carolina at Chapel Hill (UNC-CH). She expects to receive her degree in May 2010 and is conducting this research study for her Master's Paper. Gu is also working at the Health Sciences Library at UNC-CH as a Graduate Assistant. She has a strong background in health sciences and is interested in health sciences librarianship.

The objectives of her research study are to describe U.S. and Canadian dental librarians' perception and knowledge about evidence based dentistry and to describe if and how they are involved in EBD education for dental students. She will be sending you a survey that will take about 5 minutes to complete.

My role in this research is limited to pretesting the questionnaire and sending out this initial invitation email. I will not have access to the raw data she will be collecting from you. Your individual responses will be strictly confidential. Only aggregated data will be shared and no individual responses will be identified.

Kate McGraw
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Appendix C. Invitation Email for EBD Survey

Dear \${m://FirstName},

I'm writing to ask you to participate in a research study of librarians' roles in evidence based dentistry (EBD) education. I am currently pursuing my MSLS degree at the School of Information and Library Science at University of North Carolina at Chapel Hill (UNC-CH). Under the supervision of Joanne Gard Marshall and Connie Schardt I am conducting this study for my Master's Paper.

The objectives of this research study are to describe U.S. and Canadian dental librarians' perception and knowledge about evidence based dentistry and to describe if and how they are involved in EBD education for dental students. Sharing your experience and opinion will contribute to a better overall understanding of librarians' roles in EBD education – an understanding that will help the development of continuing education programs for dental librarians.

You can be a part of this unique research study by completing a Web-based survey questionnaire. The questionnaire may take about 5 minutes. Participation is voluntary. You are free to skip any question and have the right to withdraw at any time. You can NOT go back to previous pages after you click on the submit button on each page. If you break off before finishing, you need only to click the survey link in this email again to resume the survey right where you left off.

Follow this link to the Survey: \${l://SurveyLink?d=Take the Survey}

Or copy and paste the URL below into your internet browser: \${l://SurveyURL}

Follow the link to opt out of future emails: \${l://OptOutLink}

Responding to the survey indicates your consent to participate in the study. **Your individual responses will be strictly confidential. Only aggregated data will be shared and no individual responses will be identified.** There are no anticipated risks or benefits to you; however, there will be benefits to the profession in general. Summaries of the study results will be made available through my Master's Paper, which can be accessed at <http://sils.unc.edu/itrc/mpi/> soon after I receive my degree in May 2010. If you have any questions about the study or know of others who would like to participate, please do not hesitate to call me at (919) 923-6996 or email me at xmgu@email.unc.edu.

All research on human volunteers is reviewed by a committee at UNC that works to protect your rights and welfare. If you have questions or concerns you may contact, anonymously if you wish, the Institutional Review Board at (919) 966-3113 or by email to IRB_subjects@unc.edu.

Thank you for your time.

Sincerely,
Xiaomei Gu

Appendix D. First Email Reminder for EBD Survey

Hi \${ m://FirstName },

Recently I contacted you to request your participation in a unique research study on librarians' roles in evidence-based dentistry education. I am writing to encourage you to respond as soon as possible.

The objectives of this research study are to describe U.S. and Canadian dental librarians' perception and knowledge about evidence based dentistry and to describe if and how they are involved in EBD education for dental students. Sharing your experience and opinion will contribute to a better overall understanding of librarians' roles in EBD education – an understanding that will help the development of continuing education programs for dental librarians.

You can be a part of this unique research study by completing a Web-based survey questionnaire. The questionnaire may take about 5 minutes. Participation is voluntary. You are free to skip any question and have the right to withdraw at any time. You can NOT go back to previous pages after you click on the submit button on each page. If you break off before finishing, you need only to click the survey link in this email again to resume the survey right where you left off.

Follow this link to the Survey: \${ l://SurveyLink?d=Take the Survey }

Or copy and paste the URL below into your internet browser: \${ l://SurveyURL }

Follow the link to opt out of future emails: \${ l://OptOutLink }

Responding to the survey indicates your consent to participate in the study. **Your individual responses will be strictly confidential. Only aggregated data will be shared and no individual responses will be identified.** There are no anticipated risks or benefits to you; however, there will be benefits to the profession in general. Summaries of the study results will be made available through my Master's Paper, which can be accessed at <http://sils.unc.edu/itrc/mpi/> soon after I receive my degree in May 2010. If you have any questions about the study or know of others who would like to participate, please do not hesitate to call me at (919) 923-6996 or email me at xmgu@email.unc.edu.

All research on human volunteers is reviewed by a committee at UNC that works to protect your rights and welfare. If you have questions or concerns you may contact, anonymously if you wish, the Institutional Review Board at (919) 966-3113 or by email to IRB_subjects@unc.edu.

Thank you for your time.

Sincerely,
Xiaomei Gu

Appendix E. Last Email Reminder for EBD Survey

Hi \${ m://FirstName },

Recently I contacted you to request your participation in a unique research study on librarians' roles in evidence-based dentistry education. I am writing to encourage you to respond in the next two days. **This survey will be closed by 12:00 pm (Central Standard Time) Tuesday, March 9.**

The objectives of this research study are to describe U.S. and Canadian dental librarians' perception and knowledge about evidence based dentistry and to describe if and how they are involved in EBD education for dental students. Sharing your experience and opinion will contribute to a better overall understanding of librarians' roles in EBD education – an understanding that will help the development of continuing education programs for dental librarians.

You can be a part of this unique research study by completing a Web-based survey questionnaire. The questionnaire may take about 5 minutes. Participation is voluntary. You are free to skip any question and have the right to withdraw at any time. You can NOT go back to previous pages after you click on the submit button on each page. If you break off before finishing, you need only to click the survey link in this email again to resume the survey right where you left off.

Follow this link to the Survey: \${ l://SurveyLink?d=Take the Survey }

Or copy and paste the URL below into your internet browser: \${ l://SurveyURL }

Follow the link to opt out of future emails: \${ l://OptOutLink }

Responding to the survey indicates your consent to participate in the study. **Your individual responses will be strictly confidential. Only aggregated data will be shared and no individual responses will be identified.** There are no anticipated risks or benefits to you; however, there will be benefits to the profession in general. Summaries of the study results will be made available through my Master's Paper, which can be accessed at <http://sils.unc.edu/itrc/mpi/> soon after I receive my degree in May 2010. If you have any questions about the study or know of others who would like to participate, please do not hesitate to call me at (919) 923-6996 or email me at xmgu@email.unc.edu.

All research on human volunteers is reviewed by a committee at UNC that works to protect your rights and welfare. If you have questions or concerns you may contact, anonymously if you wish, the Institutional Review Board at (919) 966-3113 or by email to IRB_subjects@unc.edu.

Thank you for your time.

Sincerely,
Xiaomei Gu

Appendix F. Evidence Based Medicine Training Resources for Librarians

Online EBM Community

EBM Librarian Wiki

<http://ebmlibrarian.wetpaint.com/>

This Wiki page allows librarians who are involved in teaching and supporting EBM to “share teaching materials and class handouts, discuss issues and ask advice from colleagues, and share useful information about teaching EBM”.

EBM Course

Evidence Based Medicine course

This online course is offered through the School of Information and Library Science (SILS) at the University of North Carolina (UNC) at Chapel Hill. It has been approved for 20 MLA contact hours. For details visit this page

http://sil.unc.edu/programs/continuing_ed/ebm.html

EBM Tutorial

Introduction to Evidence-Based Medicine

<http://www.hsl.unc.edu/services/Tutorials/EBM/index.htm>

This tutorial is intended for any health care practitioner or student who needs a basic introduction to the principles of Evidence-Based Medicine. It was developed by Connie Schardt, Duke University Medical Center Library and Jill Mayer, University of North Carolina at Chapel Hill Health Science Library.

Conference

[4th International Conference on Evidence-based Library and Information Practice](#)

[5th International Conference on Evidence-based Library and Information Practice](#)