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Evidence-Based Medicine Training in United States–Based Physiatry Residency Programs

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Abstract

Although the physiatric community increasingly embraces evidence-based medicine (EBM), the current state of EBM training for trainees in physiatry is unclear. The purposes of this article are to report the results of the Association of Academic Physiatrists' surveys of physiatry residency programs in the United States, to discuss the implications of their findings, and to better delineate the "baseline" upon which sound and clear recommendations for systematic EBM training can be made. The two Association of Academic Physiatrists surveys of US physiatry residency programs reveal that most survey respondents report that they include EBM training in their programs

that covers the five recommended steps of EBM core competencies. However, although most respondents reported using traditional pedagogic methods of training such as journal club, very few reported that their EBM training used a structured and systematic approach. Future work is needed to support and facilitate physiatry residency programs interested in adopting structured EBM training curricula that include recommended EBM core competencies and the evaluation of their impact.

Keywords

Evidence-Based Medicine; Physiatry; Internship and Residency; Rehabilitation; Surveys and Questionnaires

Evidence-based medicine (EBM) is defined as the "conscientious, explicit and judicious use of current best evidence in making decisions about individual patients."[1] An EBM approach might be facilitated by adequate training both during graduate medical education and as part of lifelong learning. The five critical steps of EBM include the process of *asking, acquiring, appraising/interpreting, applying*, and *evaluating* available evidence,[2] all of which could be taught effectively during physiatry residency.

Although the physiatric community as a whole continues to embrace EBM, the current state of EBM training for trainees in physiatry is unclear. A survey published more than 20 yrs ago revealed a large gap in EBM knowledge and competency among both physiatric faculty and trainees.[3] Most residents felt that medical school did not adequately train them in EBM principles and were interested in specific training during residency to master EBM principles such as "how to apply research evidence to specific clinical situations."[3] As a first step toward addressing this gap, the Association of Academic Physiatrists' (AAP's) Research Committee and Cochrane Rehabilitation field embarked on a survey among United States–based physiatry residency programs to gain a better understanding of the current state of EBM training in the physiatry community. United States–based physiatry residency programs are 4-yr postgraduate (after a minimum of 4 yrs of graduate medical education) medical training programs in physical medicine and rehabilitation (PM&R). The first year consists of general clinical training (internship), followed by 3 yrs of specialty training in PM&R. Although research and scholarly activity are required components of a PM&R residency training program according to the PM&R Residency Review Committee of the Accreditation Council for Graduate Medical Education, there is no specific mention of EBM training, whose principles considerably overlap with the principles of research and scholarly activity.

The purposes of this article are to report the results of the AAP's first pair of surveys of physiatry residency programs in the United States, to discuss the implications of their findings, and to better delineate the "baseline" upon which sound and clear recommendations for systematic EBM training can be made.

METHODS

Two sequential electronic survey questionnaires were developed through internal discussions and committee deliberations within the Research Committee aimed at evaluating the current state of EBM training in United States–based physiatry residency programs. The survey questions were not pilot tested before administration. The AAP manages a group called the Program Directors (PD) Listserv, which consists of AAP member physicians who serve as PDs, assistant or associate PDs, and fellowship PDs in United States–based physiatry residency (currently 92 programs) and fellowship training programs. It currently (September 2020) has 112 members (ranged from 99 to 112 in 2020). Primarily through this Listserv, two surveys were distributed by the AAP to physiatry residency programs. All members of the Listserv received the surveys, including PDs and assistant or associated PDs belonging to the same residency program. However, fellowship PDs were not contacted separately from the residency PDs of the same program. Survey instructions did not specify that only one person per program should respond; therefore, when more than one survey response was received from the same program, these responses were reviewed for consistency, and the most recent survey response was included in the analysis as the survey response.

The aim of the first survey (Appendix I, Supplemental Digital Content 1, http://links.lww.com/PHM/B271) was to obtain a baseline or snapshot of what EBM training is being currently offered by US physiatry residency programs. This survey was first distributed in November 2018 to the AAP PD Listserv, with two email reminders sent at 3-wk intervals. Subsequently, the project was presented during the Residency Fellowship Program Directors precourse at “Physiatry ‘19,” AAP’s annual meeting held at San Juan, Puerto Rico, in February 2019 (attended by 98 residency or fellowship PDs and assistant or associate PDs), providing PDs the opportunity to ask questions about the survey and complete it on-site if needed. The survey closed in March 2019.

The second survey (Appendix II, Supplemental Digital Content 2, http://links.lww.com/PHM/B272) built on the information gained from survey 1 by aiming to understand whether the EBM training that was being offered in United States–based physiatry residency programs followed the five recommended steps of EBM (ask, acquire, appraise/interpret, apply, and evaluate).[2] Herein, physiatry residency programs were asked to specifically review the five EBM training steps and respond as to whether their EBM-focused training covered each step. More granular results from the second survey would serve as a scaffold to build specific recommendations to United States–based physiatry residency program regarding the implementation of EBM training protocols. The second survey was sent to the AAP PD Listserv initially in August 2019, followed by a total of three email reminders between August and October. The AAP’s Research Committee sent additional individual email requests to programs in November and December encouraging participation. The survey closed in December 2019.

RESULTS

Thirty-five of 90 (39%) programs responded to survey 1 (Appendix III, Supplemental Digital Content 3, http://links.lww.com/PHM/B273) and 28 of 90 (31%) programs

responded to survey 2 (Appendix IV, Supplemental Digital Content 4, http://links.lww.com/PHM/B274). The quantitative summaries of the survey responses are presented below. Qualitative summaries of responses from the two surveys are reported below for questions with multiple responses and for write-in comments, along with percentage responses for the "yes/no" questions. Further review of duplicate survey responses (e.g., from the PD and assistant PD of the same program) received from the same program revealed no significant discrepancies; therefore, in such instances, the more recent survey response was included in the results below.

Table 1 shows the distribution of survey (1 and 2) responders among United States–based physiatry residency programs.

Survey 1 Results

Survey 1's key questions and responses are summarized in Table 2. Most programs (71%) indicated that they provide formal EBM education. The most common method of delivering EBM training was journal club (83%), followed by isolated lectures on EBM topics (not part of a dedicated EBM course) (62%) and as part of clinical education (42%). Only about a quarter of programs reported having a dedicated EBM course (29%) or a research track (25%) for residents. Total face-to-face EBM education time ranged from 2 to 52 hrs per year and most EBM didactics were provided by physiatrist faculty. Only 42% of programs reported having a teaching faculty who served as EBM lead or director. Most programs (75%) reported having no methods of assessment, such as an examination, after their EBM education program. The biggest barriers to implementation of an EBM curriculum included "lack of faculty interest," "lack of resident interest," "lack of faculty who are knowledgeable about EBM," and "lack of EBM training resources."

Survey 2 Results

Survey 2's key questions and responses are summarized in Table 3. Most responders (>75%) reported that their training includes teaching the definition of EBM, its rationale and applicability to clinical practice, as well as introduction to the five steps of EBM. However, the actual steps of EBM that were included in the training varied between the programs. Most (>79%) of the programs reported that they teach EBM steps 1–3 (ask, acquire, and appraise/interpret), whereas fewer number of programs (<70%) reported that they teach EBM steps 4–5 (apply and evaluate). Many of the comments added indicated that EBM training was provided as a part of other residency didactic offerings such as journal club, research training, or self-reflection.

DISCUSSION

The two AAP surveys of United States–based physiatry residency programs reveal that most programs (survey respondents) reported including EBM training in their programs that covers the five recommended steps of EBM core competencies.[2] However, although most respondents reported using traditional pedagogic methods of training such as journal club, no one reported using a structured and systematic approach. These survey findings in physiatry residency programs were comparable with similar surveys of Internal Medicine

and Emergency Medicine programs.[4,5] The survey of EBM training in Internal Medicine residency programs revealed that most programs offered EBM training integrated into established clinical teaching venues, such as attending rounds (84%), resident report (82%), continuity clinic (76%), and bedside rounds (68%) and only about 37% offered a free-standing curriculum, and most programs lacked important structural elements to EBM training.[4] The Emergency Medicine residency program survey revealed similar findings that 80% of the respondents reported some EBM, although none reported a structured approach.[5] Barriers to EBM training found in these two physiatry surveys were similar to barriers reported in the Internal Medicine and Emergency Medicine program surveys.[4,5] However, response rates to the surveys in this study were lower than both the Internal Medicine (65%) and Emergency Medicine (53%) program survey response rates. There are several potential reasons for the low survey response rates, such as lack of time and lack of interest. Another potential reason could be inherent weaknesses in the EBM training of the nonresponders' programs, which may have disincentivized them from responding to the survey, thereby creating a selection bias. If this were the case, the true prevalence of EBM training in all United States–based physiatry residency programs may be lower than identified in this study.

The surveys identified several additional limitations in current EBM curricula at United States–based residency programs in physiatry. Although steps 1–3 (asking, acquire, appraise/interpret) are taught at most programs, fewer programs reported training that is devoted to steps 4–5 (apply and evaluate), which are critical steps to translate knowledge about EBM into clinical practice. The type, extent, and methods of EBM training vary widely across institutions and very few have a structured system to evaluate their EBM training. However, Yoon et al.[6] recently published the results of a structured EBM curriculum based on all five recommended EBM core competencies, which resulted in significant improvements in their physiatry residents' self-rated postcourse assessments. The reported success of the program in Yoon et al.'s[6] report provides encouragement for potential success in other physiatry residency programs assuming implementation of similarly structured, blended EBM training.

There is growing recognition of the importance of EBM in physiatry, which led to several new initiatives in the field. As an example, Cochrane Rehabilitation was established as a field in 2016 to support and strengthen the practice of EBM in PM&R.[7] In 2018, the *American Journal of Physical Medicine & Rehabilitation* launched a new monthly section titled "Evidence-Based Physiatry" (EBP)[8] that also includes Cochrane Corners[9] to facilitate the dissemination of evidence of rehabilitation interest. In a recent EBP article, Rizzo et al.[10] recommended that "EBP principles are important to understand and should be taught in residency programs following well-defined teaching approaches. Structured approaches to deliver EBM may enable more consistency and standardization of EBM training and adoption among trainees as well as practicing physiatrists. For example, in rehabilitation, review of evidence often results in the frustrating finding of "insufficient evidence; more research is needed." A standardized EBM training would better enable physiatry residents to understand that, in such instances, "best available external evidence" can be used for clinical guidance and doing so would be considered appropriate application of EBP.

Despite a call-to-action by Delisa et al.[3] in 1999, there is still a need for more progress made in EBM training in PM&R residency programs in the United States. Although the importance of an EBM approach to clinical practice and training is generally accepted and supported, there is no clear consensus on how EBM training should be implemented during residency. Experience in other fields of medicine[4,5] suggests that that EBM training might be delivered to trainees by a combination of pedagogic methods, such as team-based and/or case-based learning, as well as interactive large-group learning sessions, similar to best practices generally recommended for medical education.[11] Published studies on EBM training methods piloted in residency programs using a blended learning approach (PM&R residency program)[6] and an integrated, practical, critical appraisal approach (pediatric residency program)[12] suggest that a variety of training approaches can be used to deliver EBM curricula to residents. Schwartzstein et al.[11] recommend an approach that triggers questions and facilitates information retrieval, encourages viewing information from new perspectives, and, critically, provides the appropriate clinical context. A flipped classroom, an alternative learning approach, has also been recommended as more engaging and thought provoking than a traditional classroom environment. In the flipped classroom, direct instruction is pursued individually in advance of traditional group learning. Regardless of the pedagogic method of choice, EBM training should include the five foundational elements described in the consensus statement.[2,6]

EBM training curricula should also consider other requirements. The PM&R Residency Review Committee of the Accreditation Council for Graduate Medical Education recommends that at least 50% of program faculty participate in the scholarship of discovery (Program Requirement: II.B.5.b) and that residents should participate in scholarly activity that includes investigating one topic in depth. The outcome of such scholarly activity could include a chapter or review article; a local, regional, or national presentation; a case report/series presented as a poster or platform presentation at a national meeting; preparation or submission of a manuscript for publication; or a research project (Program Requirement: IV.B.2). However, there is no specific mention of EBM training, whose principles[2] (ask, acquire, appraise, apply, and assess) considerably overlap with the principles of research and scholarly activity. The lack of physiatry faculty who are EBM trained or interested in EBM teaching also suggests that EBM training of physiatry faculty to better enable them to teach EBM to physiatry residents is just as critical as the EBM training offered to the residents.

Given these gaps, the AAP and Cochrane Rehabilitation have recently started a collaboration to create a road map and curriculum recommendations for EBM training (content and modes of training) that could be leveraged by residency programs to create an optimized curriculum based on the “5 core EBM steps.” Structuring EBM training as a part of a “scholarly activity” requirement based on Accreditation Council for Graduate Medical Education guidelines may help programs satisfy Residency Review Committee program requirements while simultaneously increasing awareness/adoption of EBM in physiatry. Early success stories from physiatry residency programs that have implemented such training curricula[6] will prove useful as this model is replicated in other programs. The survey results reported in this article will serve as important background information to guide the development of curriculum recommendations for EBM training.

Limitations

The responder rates of these surveys were modest; therefore, there is a possibility of sampling bias where in the programs that include some type of EBM training in their residency curricula were more likely to return the survey. If the nonresponders (>60%) did not offer any EBM training in their programs, this offers much room for intervention and improvement and further emphasizes the need for improved integration of EBM into residency curricula.

CONCLUSIONS

Most survey respondents of United States–based physiatry residency programs report that they include EBM training in their programs, although very few have a structured system to deliver and evaluate EBM training. Variance in EBM training methods may be a target for best practices in pedagogy and building research capacity. Future work is needed to support and facilitate physiatry residency programs interested in adopting structured EBM training curricula that include recommended EBM core competencies and the evaluation of their impact.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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TABLE 1.

Regional distribution of survey (1 and 2) responders (de-duplicated) in residency programs

	West	Lower Midwest	Northeast	Upper Midwest	Southeast	Total
Survey 1—number of responders	8	5	10	6	5	34
Survey 2—number of responders	4	4	11	6	3	28
Total number of United States–based physiatry residency programs	16	7	25	22	20	90

TABLE 2.

Survey 1 key questions and responses

Question 6: Does your program currently provide formal EBM education?	
Yes	71.4%
Question 7: In what format is EBM education provided?	
Didactic course	29.2%
Didactic lectures (not part of an EBM course)	62.5%
Tutorial group session	4.2%
Research track for residents	25%
Journal club	83.3%
Webinar	0%
Stand-alone workshop (2–3 days)	4.2%
As part of clinical education	41.7%
Other	12.5%
Question 11: Who is involved in providing EBM education?	
Basic science faculty	52.2%
Physiatrist faculty	91.3%
Librarian	26.1%
Allied health faculty	21.7%
Other	13%
Question 12: Is there an EBM lead/champion among PM&R faculty?	
Yes	41.7%
Question 13: What type of assessment exists for EBM education?	
Written examination	8.3%
Oral examination	0%
Objective structured clinical examination	0%
No evaluation	75%
Other	20.8%
Question 15: What barriers exist to the implementation of EBM curriculum in your program?	
0–4 (0: no barrier; 4: severe barrier); percentage of 3 and 4 scores	
Lack of faculty interest	42.1%
Lack of resident interest	15.8%

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Lack of faculty who are knowledgeable about EBM	36.85%
Lack of EBM training resources	21.1%
Question 16: How important do you believe the following objectives would be to include in an EBM curriculum?	
0–4 (0: not important; 4: very important); percentage of 3 and 4 scores	
Performing critical appraisal of literature	94.7%
Searching for evidence	89.5%
Posing a focused question	79%
Applying existing evidence in clinical decision making	94.7%
Understanding biostatistical principles common to rehabilitation research	61.1%
Acquiring a more positive attitude toward EBM	66.7%
Establish a habit of lifelong learning and using EBM in clinical practice	73.7%

TABLE 3.

Survey 2 key questions and percentage of “yes” responses to whether current EBM training included this component

Question 2: Introduction to EBP	
Definition of EBP	96.4%
Rationale and background of EBP	89.3%
Clinical questions and study designs (different types)	85.7%
Teach an overview of EBP	75%
Understand distinction between using research to inform clinical decision making vs. conducting research	78.6%
Question 3: Ask (step 1)	
Recognize knowledge gaps in practice	89.3%
Generate structured answerable clinical questions	82.1%
Question 4: Ask (step 2)	
Become familiar with sources of research information, including biomedical research databases and filtered or pre-appraised evidence sources	82.1%
Carry out an appropriate literature search for clinical questions	89.3%
Question 5: Appraise and Interpret (step 3)	
Basic statistics	82.1%
Interpretation of research directions related to diagnostic accuracy, prognostic evaluation and treatment effects	78.6%
Interpretation of different types of study design	82.1%
Recognize the different levels of evidence	85.7%
Distinguish evidence-based from opinion-based clinical practice guidelines	85.7%
Recognize importance of considering conflict of interest and funding sources	82.1%
Question 6: Apply (step 4)	
How to engage patients in decision making process, use shared decision making	75%
Utilize different strategies to manage uncertainty in clinical decision making in practice	74.1%
Understand importance of baseline risk of individual patients when estimating individual expected benefit	67.9%
Question 7: Evaluate (step 5)	
Recognize barriers to knowledge translation and strategies to overcome them	46.4%
Recognize role of personal skill assessment and quality improvement in context of reflective clinical practice	75%