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ORIGINAL ARTICLE

Self-perceived evidence-based practice competencies: *a survey of faculty and students at a chiropractic institution**

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Objective: To assess the self-perceived importance, skills, and utilization of evidence-based practice (EBP) among faculty and students at a chiropractic institution without a structured EBP program. The survey also evaluated EBP satisfaction among students and EBP implementation barriers/facilitators among the faculty.
Methods: In this cross-sectional study, a set of organized questionnaires to assess the importance of EBP and self-perceived skills, utilization, barriers, and facilitators for faculty members, and student satisfaction was administered to the students and faculty of a chiropractic institution in February–March 2016. Descriptive statistics were used to evaluate responses.
Results: A total of 417 (60.1%) students and 27 (60.0%) faculty members completed the survey. Faculty members' and students' EBP importance values were similar (8.4 and 8.3 out of 10, respectively), but faculty members self-reported their EBP skills (7.3/10) at a higher level than the student self-reported skill level (6.1/10). For utilization, students reported a higher utilization of EBP than that reported by the responding faculty members. Perceived student satisfaction on the quality and content of research-related experiences decreased from the first year to the third (final) year.
Conclusion: This study found variance in the self-perceived EBP skills, utilization, barriers, and facilitators and that these skills are lagging at our doctor of chiropractic program, which does not have a structured EBP program. Faculty members and students identified the importance for EBP. Similar observations have been found at other chiropractic institutions prior to their implementation of a systematic EBP program. Those developing an EBP curriculum might use these findings to better design, implement, and assess a structured program.

Key Indexing Terms: Chiropractic; Curriculum; Education; Evidence-Based Practice

J Chiropr Educ 2021;35(1):22–27 DOI 10.7899/JCE-18-24

INTRODUCTION

It is well established that health care professionals should use evidence-based practice (EBP) in decision making during clinical care. This includes integrating relevant research with clinical expertise and patient values to make informed decisions.[1] Following the principles of EBP has become increasingly important in all aspects of health care, as a large number of population-based studies have shown evidence that patients who receive EBP therapy have better outcomes than patients who do not receive evidence-based therapy.[2–7] Within the chiropractic profession, there are debates about the need for evidence to drive practice decisions; however, this may be caused by a lack of training on EBP.[8]

EBP should be an integral part of training of medical doctors, allied health professionals, and complementary and alternative (CAM) health care providers.[9] Health care professionals are responsible for providing evidence supporting or rejecting the use of specific interventions and validation for practice methodologies.[10] Current perspectives on faculty development in EBP in medical education include the need to ground that development in a theoretical framework, to implement structured activities to support collaborative learning and knowledge sharing, and to promote scholarship.[11] Chiropractic educators have acknowledged a responsibility to educate students on EBP skills, such as creating research-focused questions, accessing clinically relevant literature, and appraising and synthesizing evidence.[12] Many chiropractic institutions have implemented EBP initiatives, noting successes as well

*This paper was selected as a 2017 Association of Chiropractic Colleges — Research Agenda Conference Prize Winning Paper — Award funded by the National Board of Chiropractic Examiners.

Table 1 - Surveys Available From the Project to Enhance Research Literacy[15a]

Survey Name, Institution, Audience	Dimensions Evaluated
Evidence-Informed Practice (EIP) Survey - Bastyr University - Faculty	Demographics Perceptions of EIP—barriers/facilitators* Classroom utilization* Clinic utilization Knowledge of information literacy Utilization of sources and electronic of expertise
Naturopathic Physician Research Education Project (N-PREP) Research Survey - Bastyr University - Students (pre- and postassessment)	Research concept knowledge Attitudes toward research Confidence with EBP concepts
Clinical Supervision Research Content Survey - Bastyr University - Faculty in clinical setting	Utilization of EBP
PRE/POST EIP Course Survey - Northwestern Health Sciences University - Students	EIP knowledge* EIP utilizations* EIP satisfaction*
Intern Interaction Survey - University of Western States - Faculty in clinical settings	Demographics Student utilization of EBP
Faculty Survey for EBP - University of Western States - Faculty in academic settings	Research concept utilization EBP concept utilization
EBP Grant Study Survey - University of Western States - Students	EBP attitudes EBP skills/knowledge

[a] Asterisks identify dimensions included in this survey.

as areas for improvement with the most successful programs focused on faculty development in research literacy and fundamentals of EBP.[13] Instructional approaches varied considerably across these institutions. The most common were workshops, online resources, in-person short courses, and in-depth seminar series. Many institutions have also provided faculty with additional intensive extramural training opportunities, such as the McMaster Evidence-Based Clinical Practice Workshop program. These instructional approaches can be of practical use in CAM and non-CAM academic environments that are considering the introduction of research literacy and EBP competencies into their curricula.[13]

Understanding how EBP is perceived and implemented across an educational program by both faculty members and students can identify needs and guide where new training is needed.[14] The aim of this survey was to gather current faculty member and student self-reports of EBP competencies within a chiropractic institution in the United States that did not have a structured EBP program. This research included student and faculty attitudes on the importance, skills, and utilization of EBP as well as student satisfaction and faculty members' barriers/facilitators.

METHODS

Study Design

This cross-sectional survey was conducted among students and faculty members at in a doctor of chiropractic program (DCP) during February–March 2016 with approval from the institutional review board of Parker University (#A-00145).

Measures

A survey instrument was developed to assess current institutional perceptions related to EBP. A pool of items was developed for possible inclusion in the survey instrument after reviewing competencies for EBP from other chiropractic programs and reviewing surveys from the Academic Collaborative for Integrative Health's Project to Enhance Research Literacy (PERL)[15] as shown in Table 1. The competencies surrounded both the understanding of EBP and research and the skills required to undertake EBP. These included competencies such as understanding the role of EBP in chiropractic practice, applying principles of research, developing research questions, conducting a literature search, implementing critical appraisal for published manuscripts, applying and synthesizing evidence, and engaging in research activities.

From the PERL website, 7 potentially relevant surveys were reviewed. Questions or sections from each of these surveys were selected with additional questions developed to ensure that all desired competencies were addressed. Six faculty members and administrators validated the content of the faculty survey prior to its implementation; the student survey was not content validated. The final survey consisted of 27 items: perceptions on skills and importance of EBP (14 items) and utilization of EBP (13 items).

Importance and skills were rated on a 0–10 scale, with skills rated "not competent" to "very competent" and importance rated from "not important" to "very important". Utilization used a 1–4 scale, with 1 being "never," 2 being "once or twice," 3 being "in about half of my courses or clinical encounters," and 4 being "in almost all of my courses and clinical encounters". Importance, skill, and utilization items were categorized into the 7 developed EBP competencies. Additional items were added to assess demographic characteristics.

Three versions of the survey were developed, targeting academic teaching faculty members, clinical practice faculty members, and students. Both faculty versions included an additional 16 items on barriers/facilitators to EBP, scoring from 0 ("low agreement") to 10 ("high agreement") with a low score indicating a barrier and a high score indicating a facilitator. These 16 items were categorized into administrative support, research institute support, library support, confidence in EBP skills, time constraint, and usefulness of EBP. Additionally, faculty members were given the opportunity to add additional barriers/facilitators on the survey. The only difference between academic and clinic faculty surveys consisted of questions focused on course material versus clinical cases, respectively. The student version also included 1 item on student satisfaction, scoring from 0 ("not satisfied") to 10 ("very satisfied"). Academic teaching faculty, clinical practice faculty, and student surveys (Appendices A–C) are provided as supplementary online content at www.journchiroed.com.

Survey Distribution

For students in the first 2 years of the program, an instructor distributed and allowed time (20–30 minutes) for the surveys to be completed during a class session. For students in the last year of the program, time was provided by the clinical practice faculty for surveys to be distributed during a prespecified meeting time. Students absent in class or from the meeting did not take the survey.

Faculty members received the survey hard copy in their mailbox, which was followed by an e-mail notification from the research team, and were encouraged to participate in the survey at designated department meetings. Faculty members were asked to deposit the survey anonymously in a box centrally located within their work areas.

Statistical Analysis

Descriptive statistics, including response frequencies and means for each measure, were analyzed using SAS version 9.4 software (SAS Institute Inc, Cary, North Carolina). The average subscores for importance, skills, utilization, and barriers/facilitators were calculated using the EBP competencies developed for this study as well as the overall mean ranges. Subanalyses included students by year in program and faculty members by their departments: academic faculty (basic sciences, chiropractic sciences, and clinical sciences) and clinical faculty.

Table 2 - Student Response Rates to Survey by Terms

Terms	Number of Students	Number of Completed Surveys	Response Rate
Year 1			
1	98	85	86.7%
2	118	32	27.1%
3	55	49	89.1%
4	84	61	72.6%
Year 2			
5	74	27	36.5%
6	53	37	69.8%
7	79	60	75.9%
Year 3			
8	80	53	66.3%
9/10	53	13	24.5%
Total	694	417	60.1%

RESULTS

Participant Response Rates and Characteristic

Tables 2 and 3 outline the student and faculty response rates, respectively. Students had a 60.1% response rate that ranged from 24.5% to 89.1% based on years in program. Faculty members had a 60.0% response rate with an average of 11.3 years at the institution (SD = 8.24).

Importance and Skills of EBP

Table 4 depicts faculty and student average responses to the importance and skills of EBP competencies. Faculty members and students scored EBP importance with an average score of 8.4 and 8.3 (out of 10), respectively. EBP skills had an average of 7.3 for faculty members and 6.1 for students. For both faculty members and students, "engage in research" was the competency rated as lowest in both importance and skill (importance of 7.4 and 7.6, respectively; skill of 6.1 and 5.0, respectively). Faculty members scored "conduct search" highest in both importance and skills (8.9 and 8.1, respectively) with "role of EBP in chiropractic practice" and "critically appraise research" as equally important (8.8 and 8.9, respectively). In contrast, students found "critically appraise research" to be the most important (8.7) but considered themselves most skilled with "role of EBP in chiropractic practice" (6.5).

Table 3 - Academic Teaching and Clinical Practice Faculty Response Rates

Departments	Number of Faculty Members	Number of Completed Surveys	Response Rate
Clinical faculty	10	5	50.0%
Academic faculty			
Basic sciences	11	4	36.4%
Chiropractic sciences	12	6	50.0%
Clinical science	12	12	100%
Total	45[a]	27	60.0%

[a] Includes missing members ($n = 2$).

Table 4 - Faculty ($n = 29$) and Student ($n = 417$) Importance, Skills, and Utilization of Evidence-Based Practice (EBP) Competencies With Comparison to Prior Literature (Mean [SD]) (Faculty, $n = 29$; Students, $n = 417$)

	Importance		Skills		Utilization	
Competencies	**Faculty**	**Students**	**Faculty**	**Students**	**Faculty**	**Students**
Role of EBP in chiropractic practice	8.8 (1.09)	8.6 (1.33)	7.9 (1.10)	6.4 (1.84)	2.7 (0.79)	2.6 (0.84)
Principles of research	7.6 (1.91)	7.9 (1.99)	6.3 (1.65)	6.0 (2.30)	2.5 (0.63)	2.7 (0.68)
Develop focused research question	8.5 (1.86)	8.6 (1.71)	7.8 (1.53)	6.2 (2.09)	1.4 (0.69)	2.4 (0.91)
Conduct search	8.9 (1.31)	8.5 (1.90)	8.1 (1.17)	6.3 (2.24)	1.5 (0.74)	2.2 (0.86)
Critically appraise research	8.9 (1.28)	8.7 (1.56)	7.2 (1.37)	6.3 (2.07)	1.8 (0.78)	2.3 (0.78)
Apply synthesized evidence	8.7 (1.31)	8.3 (1.80)	7.5 (1.26)	6.1 (2.02)	2.2 (0.54)	2.6 (0.68)
Engage in research	7.4 (2.27)	7.6 (2.34)	6.1 (1.95)	5.0 (2.66)	1.5 (0.45)	2.0 (0.77)
Overall ranges	7.4–8.9	7.6–8.7	6.1–8.1	5.0–6.4	1.4–2.7	2.0–2.7
Evans et al[17] ranges	7.5–9.0	7.8–9.4	4.0–7.0	5.1–7.3	NA	NA

EBP Utilization

Table 4 describes EBP utilization in faculty members and students by competency. Overall, students felt they are utilizing EBP more than faculty members stated using them (2.0 and 2.4 out of 4, respectively). EBP utilization in faculty members was also evaluated among various departments. The average score was 2.4, 2.1, 1.7, and 2.1 in basic sciences, chiropractic sciences, clinical sciences, and clinical faculty, respectively. Evaluation shows basic sciences faculty members with the highest EBP utilization followed by chiropractic science, clinical faculty, and clinical science in the following 3 survey questions: developing focused research questions, conduct research, and engage in research.

Student EBP Satisfaction

EBP satisfaction scores started out high 7.3 (out of 10) but progressively declined to as low as 5.0 and 4.7 by the end of the program. The overall satisfaction average was 5.5.

Faculty Barriers/Facilitators to EBP

As shown in Table 5, all scores were between 6.0 and 7.9 out of 10. Support from administration, the library, and research all had the lowest scores of 6.0 to 6.3. No additional barriers/facilitators were added to those listed on the survey.

DISCUSSION

This study evaluated EBP competencies within a DCP that did not have a structured EBP program. Faculty members' and students' EBP importance values were similar (7.4–8.9 versus 7.6–8.7, respectively); however, faculty members self-reported their EBP skills to be higher than the student's self-reported skill level (6.1–8.1 versus 5.0–6.4, respectively). For utilization, students reported a higher utilization of EBP than that reported by the responding faculty members. Satisfaction of students to the quality and content of research-related experiences decreased throughout the curriculum, as students more advanced in the program were less satisfied than those who were in their first year. Perceived barriers to teaching EBP by the faculty members found most factors to be mediocre with no single resounding area of concern or satisfaction. Overall, this study identified the need for not only a strategic implementation to incorporate EBP in DCP, which would further enhance learning, but also its application in clinical practice.

Training of EBP within chiropractic curriculum began toward the end of the 1990s with a wide variance of its application among chiropractic training programs.[16] Our study found that in a DCP without a structured EBP program, these skills are lagging, which was also found in another institution prior to their implementation of a systematic program.[17] Similarly, Evans et al[17] found that faculty members and students at their institution that included chiropractic medicine, massage, acupuncture, and Eastern medicine also valued the importance of acquiring EBP skills to integrate research, but skills were not adequate to do so. The findings of the survey suggest that the existing organizational processes may need modification to enhance research and EBP behaviors with support for faculty development.[17]

Our survey rated several of the faculty members' perceived barriers/facilitators that should be considered as a program is developed, including administrative support, research institute support, library support, confidence in EBP skills, time constraints, and usefulness of EBP. Although the basic science department had only a 50% response rate, they had higher scores for all variables in this section, thus identifying them more as facilitators than as barriers. For faculty as a whole, no clear barrier/facilitator was identified; rather, respondents rated all of them with a mediocre score. Support from administration, from the research institute, and from the library had the lowest scores, which may

Table 5 - Evidence-Based Practice (EBP) Faculty Barriers/Facilitators (Scale: 0 = "Low Agreement" to 10 = "High Agreement")

Item	**Mean (SD)**
Administrative support	6.3 (0.43)
Research institute support	6.0 (NA)
Library support	6.0 (0.32)
Confidence with EBP skills	6.7 (0.60)
Time constraint	6.8 (NA)
Usefulness of EBP	7.9 (0.55)

identify an opportunity for more resources and education. However, close evaluation should be done to ensure that intended changes are being made as planned.

Multifaceted programs are the current best-practice recommendations and are also found in the 9 CAM institutions implementing an EBP program.[13,18] By contrast, in the medical literature, a single strategy of workshop and e-learning courses[19] has been recommended. Another survey of 9 CAM institutions that implemented a rigorous EBP curriculum found several strategies that were effective for faculty development, including developing and adopting research literacy and EBP competencies, targeting early adopters and change leaders, employing best practices in teaching and education, providing meaningful incentives, capitalizing on resources provided by conventional partners, providing external training opportunities, and garnering support from institutional leadership.[13]

Banzai et al[20] conducted a Web-based international survey of chiropractic students regarding EBP principles (n = 674 students), of whom 71% felt they needed more training in EBP in order to be able to apply evidence in chiropractic care. Similar to our results, students felt that they were utilizing EBP principles, and student respondents without formal training had a self-perceived lower confidence in understanding these concepts. Future research should explore if satisfaction scores continue to decline throughout the program or if this was just a cross-sectional finding. If it continues to decline, reasons for this should be explored with qualitative methods.

Strengths and Limitations

The results of this study should be interpreted cautiously, taking into account some limitations. First, the cross-sectional nature of this study hindered the ability to infer causal relationships between the study variables. Social desirability bias is also a concern for this study, as it is possible that both faculty members and students put values that they believed were the desired response from the university and not that of their own opinion.

Additionally, while this survey had appropriate response rate for both faculty members and students, student response rates were heterogeneous based on year in program. This heterogeneity may have been caused by different individuals introducing and encouraging completion of the survey, by a different number of students in the course on day of administration, or by students in the clinic (third year) having flexible schedules and thus not being available during the active data collection period. Future studies should include further efforts to recruit students and faculty members who were nonresponders to the first attempt for data collection.

Finally, while sections of this survey have been used at previous institutions with slight modifications for our population, they were not assessed for property measurements beyond faculty content validity, leaving the survey questions susceptible to different interpretations. Another limitation was that "skills" and "utilization" were assessed by self-report only. These should also be measured with tests or curriculum reviews that would directly assess these items.

CONCLUSION

This study found variance in the self-perceived EBP skills, utilization, barriers, and facilitators and that these skills are lagging at our DCP program, which does not have a structured EBP program. Faculty barriers/facilitators to teaching EBP need to be considered before a structured EBP curriculum is developed. Self-perceived skills deficits were for the EBP competencies of: basic principles of EBP and need to engage in research activities. The most notable barriers found in this study included a lack of support from administration, from the research institute, and from the library. This need for support identifies some opportunities for resource priorities.

ACKNOWLEDGMENTS

We acknowledge Ms. Shae Martinez from the Parker University Library for her contribution in providing research articles and reference preparation.

FUNDING AND CONFLICTS OF INTEREST

This work was funded internally. The authors have no conflicts of interest to declare relevant to this work.

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This article was received July 16, 2018; revised February 6 and April 15, 2019; and accepted May 15, 2019.

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Concept development: KP, AO. Design: KP, AO. Supervision: KP. Data collection/processing: KP, AO, PS, GG. Analysis/interpretation: KP, MH, AO, PS. Literature search: KP, AO, PS, GG. Writing: KP, AO, PS, GG, MH. Critical review: KP, AO, PS, GG. MH.

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