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The Evidence-based Practice Beliefs and Knowledge of Physical Therapy Clinical Instructors

Introduction: For evidence-based practice to occur in patient management or clinical instruction, a knowledge of evidence-based practice principles is needed, including how to retrieve, appraise, and apply evidence. Attitudes and beliefs are also important, since for effective change in practice to occur it must be consistent with beliefs and needs. **Purpose:** The purpose of this study was to examine the evidence-based practice beliefs and knowledge of physical therapist clinical instructors and to determine whether differences in self-reported beliefs or knowledge existed based upon respondent characteristics of highest degree, age, association membership, and certification. **Methods:** For this cross-sectional descriptive study an electronic survey was used to collect data on respondent characteristics and evidence-based practice beliefs and knowledge. **Results:** Respondents were 376 physical therapists who were clinical instructors. A majority of respondents reported positive beliefs about evidence-based practice: welcome questions on practice (88.5 %, $n = 333$); fundamental to practice (89.7%, $n = 337$); practice changed because of evidence (81.1%, $n = 305$). From rating options of *poor*, *fair*, *good*, *very good*, and *excellent*, respondents most often selected *good* to describe knowledge level: formulate question 39.6% ($n = 149$); retrieve evidence 39.4% ($n = 148$); appraise evidence 44.1% ($n = 166$); and apply evidence 40.4% ($n = 152$). Nearly half of the respondents reported as either *very good* or *excellent* the ability to apply evidence (49.4%, $n = 186$). There were differences in evidence-based practice beliefs (degree $H = 10.152$, $p = .038$; membership $z = 4.721$, $p = H = 27.712$, $p = z = 2.188$, $p = .03$; certification $z = 4.194$, $p =$ Conclusion: Respondents frequently reported positive beliefs about evidence-based practice and the possession of evidence-based practice knowledge. However, there were respondents who reported negative beliefs such as disagreeing that new evidence is important. There were wide variations in reported evidence-based practice knowledge. The largest percentage of respondents rated knowledge as *good*, the middle or 'average' rating on the five-point scale. There were differences in evidence-based practice beliefs and knowledge between groups for highest degree, association membership, and specialty certification.

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ABSTRACT

For evidence-based practice to occur in patient management or clinical instruction, a knowledge of evidence-based practice principles is needed, including how to retrieve, appraise, and apply evidence. Attitudes and beliefs are also important, because for effective change in practice to occur, it must be consistent with beliefs and needs. **Purpose:** The purpose of this study was to examine the evidence-based practice beliefs and knowledge of physical therapist clinical instructors and to determine whether differences in self-reported beliefs or knowledge existed based upon respondent characteristics of highest degree, age, association membership, and certification. **Methods:** For this cross-sectional descriptive study, an electronic survey was used to collect data on respondent characteristics and evidence-based practice beliefs and knowledge. **Results:** Respondents were 376 physical therapists who were clinical instructors. A majority of respondents reported positive beliefs about evidence-based practice: welcome questions on practice (88.5%, $n = 333$); fundamental to practice (89.7%, $n = 337$); practice changed because of evidence (81.1%, $n = 305$). From rating options of *poor*, *fair*, *good*, *very good*, and *excellent*, respondents most often selected *good* to describe knowledge level: formulate question 39.6% ($n = 149$); retrieve evidence 39.4% ($n = 148$); appraise evidence 44.1% ($n = 166$); and apply evidence 40.4% ($n = 152$). Nearly half of the respondents reported as either *very good* or *excellent* the ability to apply evidence (49.4%, $n = 186$). There were differences in evidence-based practice beliefs (degree $H = 10.152$, $p = .038$; membership $z = 4.721$, $p < .01$) and knowledge (degree $H = 27.712$, $p < .01$; membership $z = 2.188$, $p = .03$; certification $z = 4.194$, $p < .01$) based upon highest degree, association membership, and specialist certification. **Conclusion:** Respondents frequently reported positive beliefs about evidence-based practice and the possession of evidence-based practice knowledge. However, there were respondents who reported negative beliefs such as disagreeing that new evidence is important. There were wide variations in reported evidence-based practice knowledge. The largest percentage of respondents rated knowledge as *good*, the middle or "average" rating on the five-point scale. There were differences in evidence-based practice beliefs and knowledge between groups for highest degree, association membership, and specialty certification.

INTRODUCTION

Evidence-based practice involves the use of the best, clinically relevant, evidence in combination with clinical expertise and patient preferences/circumstances in patient management.¹ It is a five-step process in which the practitioner formulates a question, searches for evidence, appraises evidence, applies evidence, and then evaluates outcomes. Foundational to the ability to apply evidence-based practice to patient management or clinical instruction is the knowledge of evidence-based practice steps, or principles.¹ Attitudes and beliefs about are also important to evidence-based practice, because for effective change in practice, it must be consistent with beliefs and needs.²

Evidence-based Practice Beliefs of Physical Therapists

The evidence-based practice attitudes and beliefs of physical therapists in the United States have been addressed in the past. Jette et al, from a survey of 1,000 physical therapists who were American Physical Therapy Association members, reported that respondents agreed evidence-based practice is needed and improves quality of care.³ From surveys of 24 physical therapists given prior to and after a presentation on select intervention topics, Fruth et al reported that physical therapists agreed evidence-based practice is a fundamental part of physical therapy practice, but this belief was not associated with American Physical Therapy Association membership, age, degree, experience, or practice setting.⁴ Schreiber et al surveyed 21 physical therapists before and six months after an evidence-based practice workshop and reported positive evidence-based attitudes.⁵ However, the authors noted that in spite of positive attitudes, participants reported continued reliance on traditional sources of information such as experience and advice from colleagues rather than scientific evidence.

Evidence-based Practice Knowledge of Physical Therapists

Significant variations in evidence-based practice knowledge levels among United States physical therapists have been reported.^{3,4,6} Based upon self-reported information from members of the American Physical Therapy Association, Jette et al reported a positive association between evidence-based practice knowledge and professional and advanced degrees, while age and years since licensure were negatively associated.³ Jette and colleagues reported physical therapists with a certificate or baccalaureate degree as their first-professional degree indicated lower levels of knowledge of evidence-based practice than those with a post-baccalaureate professional degree, or an advanced degree. Younger physical therapists tended to have more knowledge about evidence-based practice than those with more than 15 years of clinical experience.³ Limitations in the ability to critically analyze literature has been reported as a barrier to the use of evidence-based practice.^{3,4} In addition, clinical instructors reported evidence-based practice knowledge lower than what the level they felt was a desirable or "more than adequate" for a clinical instructor.^{6p55}

Evidence-based Practice in Physical Therapy Education

Physical therapists who serve as clinical instructors acknowledge the importance of evidence-based practice, expressing that it is desirable to possess "more than adequate evidence-based practice knowledge to be an effective and competent clinical instructor."^{6p.55} Contrary to their beliefs and opinions, only 46% of clinical instructors reported actually possessing this level of knowledge (the clinical instructor most likely to possess the desired level of knowledge holds the Doctor of Physical Therapy degree).⁶ According to Recker-Hughes et al., of all clinical instructors with a degree lower than the Doctor of Physical Therapy, 59% reported evidence-based practice knowledge below the desirable level.⁶ These findings are supported by a survey of clinical instructors by Sabus.⁷ Clinical instructors more likely to be competent in evidence-based practice and use evidence-based practice regularly are younger, recent graduates who possess a higher professional degree, and are members of the American Physical Therapy Association.⁷

Purpose

The purpose of this study was to examine the beliefs and knowledge about evidence-based practice of clinical instructors for United States student physical therapists and to determine whether differences in self-reported beliefs or knowledge existed based upon respondent characteristics of highest degree, age, association membership, specialty certification.

SUBJECTS

The American Physical Therapy Association Research Department granted approval to recruit participants from the Physical Therapist Clinical Performance Instrument Web database.⁸ Recruited to participate in this study were physical therapists, registered as clinical instructors in the Physical Therapist Clinical Performance Instrument Web database who, during 2012, were active clinical instructors for United States student physical therapists. Excluded were those who had not supervised a student in 2012. Also excluded were those who had supervised any student physical therapist assistants since clinical instructors may hold different beliefs about evidence-based practice as it relates to the clinical instruction of these students than student physical therapists.

METHODS

Study Design

An electronic survey was used for this cross-sectional descriptive study. The study was approved by the Institutional Review Board of A.T. Still University.

Instrument

The Clinical Effectiveness and Evidence Based Practice Questionnaire, a reliable and valid instrument, was used in this study with permission from Professor Upton and Dr. Upton (Appendix).^{9,10} The questionnaire was designed to measure evidence-based

practice knowledge, beliefs, and use. Internal reliability was reflected by an overall questionnaire Chronbach's alpha score of 0.87.¹⁰ The authors reported high face validity and test-retest reliability scores of 0.80 to 0.92.^{9,10}

The instrument was used to collect information on respondent evidence-based practice beliefs and knowledge. Respondents rated their level of agreement with belief statements on a five-point scale with the following response options: *strongly disagree*, *disagree*, *neither agree nor disagree*, *agree*, or *strongly agree*. Knowledge level was ranked on a five-point scale, rather than the original seven-point scale, with the following choices: *poor*, *fair*, *good*, *very good*, or *excellent*. As the intent of this study was to examine respondents' attitudes and knowledge as clinical instructors, the phrase *as a clinical instructor*, was inserted at the beginning of the questions.

Method of Data Collection

The modified instrument was formatted electronically to collect data. The sample for this study was drawn from the Physical Therapist Clinical Performance Instrument Web database.⁸ There were a total of 44,432 users, including those who coordinate clinical education (may be discipline other than physical therapy) and those who supervise student physical therapists and student physical therapist assistants, in the database at the time the sample was drawn. In accordance with the study inclusion criteria, selected from the database were physical therapists who in 2012 were clinical instructors associated with physical therapist education programs in the United States. Of all users in the database, 2,000 met the inclusion criteria. From this 2,000, using randomization software, a sample of 1,500 prospective participants as approved by the American Physical Therapy Association Research Department was drawn. There was an initial email request to participate and two reminder notifications. Invalid email addresses rendered 35 messages undeliverable, resulting in a sample size of 1,465. Informed consent was implied by completion of the survey. No identifiable information was collected; all data were completely anonymous.

Data Reduction and Analysis

The responses from the electronic survey were downloaded for analysis. Responses from those not meeting the defined inclusion criteria (physical therapist, registered as a clinical instructor in the Physical Therapist Clinical Performance Instrument Web database, and an active clinical instructor for one or more student physical therapists in the United States in 2012) were excluded from data analysis. The responses from those who did not respond to questions on the inclusion criteria were also excluded. Likert scale responses were assigned numerical values to allow for statistical analysis. Statistical Package for Social Services (SPSS) version 18.0 (Chicago, IL) was used for analysis. For demographic characteristics, response frequencies and percentages were calculated.

The independent variables in this study were ordinal and nominal, and the data were not normally distributed as determined by a Kolmogorov-Smirnov test, thus nonparametric tests were performed. Evidence-based practice beliefs and knowledge were described through the use of response frequencies and percentages. To examine whether there were differences in evidence-based practice beliefs or knowledge based upon age or degree, a two-tailed Kruskal-Wallis test was performed ($\alpha = .05$). To examine whether differences in evidence-based practice beliefs or knowledge existed as the result of American Physical Therapy Association membership status or American Board of Physical Therapy Specialties certification, a two-tailed Mann-Whitney *U* test was performed ($\alpha = .05$). Only one respondent reported highest degree as certificate, thus this category was eliminated as it did not meet the minimum cell count criteria for data analysis.

RESULTS

From a pool of 1,465 prospective participants, a total of 376 completed surveys met the inclusion criteria, for a response rate of 26%. Excluded from data analysis were surveys of respondents who did not meet the inclusion criteria or failed to provide responses to inclusion criteria related questions.

Participant Characteristics

The majority of respondents were females (71%, $n = 267$) under the age of 40 (56.1%, $n = 210$). Of the total respondents, 61.2% ($n = 230$) reported being credentialed as a clinical instructor by the American Physical Therapy Association, highest degree was reported as Doctor of Physical Therapy by 45.2% ($n = 170$), 42.3% ($n = 159$) were American Physical Therapy Association members, and 14% ($n = 52$) reported certification from the American Board of Physical Therapy Specialties.

Evidence-based Practice Beliefs

Many respondents reported positive beliefs about evidence-based practice (Table 1). Respondents most often selected *agree* or *strongly agree* for the following positive belief statements: welcome questions on practice (88.5%, $n = 333$); evidence-based practice is fundamental to practice (89.7%, $n = 337$); and my practice changed because of evidence (81.1%, $n = 305$). For the following negative belief statements, respondents most often selected the *disagree* or *strongly disagree* response option: I resent

having my practice questioned (72.3%, $n = 272$); evidence-based practice is a waste of time (90.7%, $n = 314$); and I stick to tried and trusted methods (80.9%, $n = 304$). The responses about the belief statement that workload is too great to keep up to date were split: 40.2% ($n = 151$) agree or strongly agree; 36.2% ($n = 136$) disagree or strongly disagree; and 21.3% ($n = 87$) neutral. The highest percentage of respondents was neutral with respect to level of agreement with the statement that new evidence is important: neutral 41% ($n = 154$).

Table 1. Self-reported Evidence-based Practice Beliefs

Evidence-based Practice Statement	Reported Frequency of Agreement ($N = 376$)									
	Strongly Disagree		Disagree		Neither Agree or Disagree		Agree		Strongly Agree	
	n	%*	n	%*	n	%*	n	%*	n	%*
New evidence is important I make time	10	2.7	71	18.9	154	41	111	29.5	28	7.4
Welcome questions on my practice	1	0.3	7	1.9	33	8.8	252	67.0	81	21.5
Evidence-based practice is fundamental to practice	3	0.8	2	0.5	31	8.2	221	58.8	116	30.9
My practice changed because of evidence	3	0.8	11	2.9	55	14.6	212	56.4	93	24.7
My workload is too great to keep up to date	26	6.9	110	29.3	87	23.1	130	34.6	21	5.6
I resent having my practice questioned	90	23.9	182	48.4	80	21.3	19	5.1	3	0.8
Evidence-based practice is a waste of time	191	50.8	150	39.9	30	8.0	1	0.3	2	0.5
I stick to tried and trusted methods	110	29.3	194	51.6	60	16.0	8	2.1	1	0.3

*Percentages may not equal 100% as not all respondents answered all questions

Respondent Characteristics and Evidence-based Practice Beliefs

There was a difference between highest degree groups and level of agreement with two of the belief statements: new evidence is important, and evidence-based practice is a waste of time (Table 2). There was no difference between highest degree groups and other belief statements or age and any of the statements.

Table 2. Differences in Evidence-based Practice Beliefs and Knowledge between Highest Degree and Age Groups

Evidence-based Practice Statement	Highest Degree		Age	
	H^a	p^b	H^a	p^b
Beliefs				
New evidence is important I make time	10.152	.038	7.877	.163
Welcome questions on my practice	8.978	.062	2.660	.752
Evidence-based practice is fundamental to practice	2.849	.583	6.211	.760
My practice changed because of evidence	6.277	.179	3.609	.607
My workload is too great to keep up to date	1.924	.750	9.421	.093
I resent having my practice questioned	8.734	.068	2.974	.704
Evidence-based practice is a waste of time	17.144	<.001	8.703	.121
I stick to tried and trusted methods	5.137	.274	1.664	.893
Knowledge				
Ability to convert needs to question	27.712	<.001	5.176	.395
Knowledge of how to retrieve evidence	23.048	<.001	8.168	.147
Ability to critically analyze evidence	15.296	<.001	4.592	.468
Ability to apply information	5.740	.219	1.525	.910

^aKruskal-Wallis H statistic; with three degrees of freedom and $p = .05$ H must be ≥ 7.82 to be considered significant; with

five degrees of freedom and $p = .05$ H must be ≥ 11.07 to be considered significant; ^bAsymptotic Significance (2-sided)

Post hoc comparisons revealed a difference between highest degree groups for two of the belief statements (Table 3). Respondents with a highest degree of bachelor degree or Doctor of Physical Therapy degree ranked agreement with the statement that new evidence is important higher than those whose highest degree was a master's degree. Those with the Doctor of Physical Therapy as highest degree ranked agreement with the statement that evidence-based practice is a waste of time lower than those with bachelor's or master's degrees.

Table 3. Post Hoc Results – Highest Degree vs. Beliefs and Knowledge

Evidence-based Practice Statement	z^a	p^b	Degree	Mean Rank
Beliefs				
New evidence is important I make time	2.903	<.001	Bachelor	113.15
			Master	90.49
New evidence is important	2.533	.010	Master	132.59
			Doctor of Physical Therapy	156.63
Evidence-based practice is a waste of time	2.970	<.001	Bachelor	139.91
			Doctor of Physical Therapy	114.16
Evidence-based practice is a waste of time	3.406	<.001	Master	162.19
			Doctor of Physical Therapy	135.08
Knowledge				
Ability to convert needs to question	4.517	<.001	Bachelor	92.69
			Doctor of Physical Therapy	134.19
Knowledge of how to retrieve evidence	3.775	<.001	Bachelor	97.20
			Doctor of Physical Therapy	132.21
Ability to critically analyze evidence	2.993	<.001	Bachelor	102.38
			Doctor of Physical Therapy	129.92

^aMann Whitney U -Test z value statistic; with Bonferroni correction $p = .01$ z must be ≥ 2.576 to be considered significant

^bAsymptotic Significance (2-sided)

Note – Higher rank represents stronger agreement with statement

Table 4 displays the rankings of evidence-based practice beliefs statements based on American Physical Therapy Association membership and American Board of Physical Therapy Specialties certification. There was a statistically significant difference between the responses of those who were Association members and non-members. Members ranked the following positive belief statements higher (agreement) and negative statements lower (disagreement) than non-members: evidence-based practice is fundamental to practice ($z = 2.891$, $p = <.01$); my practice changed because of evidence ($z = 4.721$, $p = <.01$); I resent having my practice questioned ($z = 2.601$, $p = .01$); evidence-based practice is a waste of time ($z = 3.016$, $p = <.01$); I stick to tried and trusted methods ($z = 2.256$, $p = .02$). Those respondents with American Board of Physical Therapy Specialties certification also ranked some positive statements higher and negative statements lower than those without certification: new evidence is important I make time ($z = 3.355$, $p = <.01$); my practice changed because of evidence ($z = 3.661$, $p = <.01$); my workload is too great to keep up to date ($z = 2.090$, $p = .04$); evidence-based practice is a waste of time ($z = 2.731$, $p = <.01$).

Table 4. Differences in Evidence-based Practice Beliefs and Knowledge between American Physical Therapy Association (APTA) Membership and American Board of Physical Therapy Specialties (ABPTS) Certification Groups

Evidence-based Practice Statement	APTA Membership				ABPTS Certification			
	z ^a	p ^b	Mean Rank		z ^a	p ^b	Mean rank	
			Member	Non-member			Certified	Non-certified
Belief								
New evidence is important I make time	1.690	.091	197.96	179.85	3.355	.001	229.65	178.44
Welcome questions on my practice	.440	.660	189.88	185.76	1.431	.152	202.00	182.86
Evidence-based practice is fundamental to practice	2.891	.004	203.43	174.93	1.744	.081	206.08	181.62
My practice changed because of evidence	4.721	<.001	215.09	167.32	3.661	<.001	230.93	178.25
My workload is too great to keep up to date	.044	.965	188.23	188.70	2.090	.037	158.76	191.01
I resent having my practice questioned	2.601	.009	171.72	199.04	1.488	.137	166.33	188.56
Evidence-based practice is a waste of time	3.016	.003	169.85	200.41	2.731	.006	151.51	190.93
I stick to tried and trusted methods	2.256	.024	173.62	196.83	1.604	.109	164.76	188.25
Knowledge								
Ability to convert needs to question	2.188	.029	199.50	176.20	4.194	<.001	239.84	175.40
Knowledge of how to retrieve evidence	.845	.398	191.76	182.70	3.468	<.001	231.08	177.34
Ability to critically analyze evidence	1.136	.256	193.52	181.43	3.666	<.001	233.28	177.01
Ability to apply information	2.665	.008	201.82	173.74	5.002	<.001	249.18	173.35

^aMann Whitney U-Test z value statistic; with $p = .05$ z must be ≥ 1.96 to be considered significant; ^bAsymptotic Significance (2-sided)

Self-reported Evidence-based Practice Knowledge

The self-reported levels for knowledge that directly supports steps in the evidence-based practice process ranged from *poor* to *excellent* (Table 5). Respondents most often reported skill level as *good*: formulate question 39.6% ($n = 149$); retrieve evidence 39.4% ($n = 148$); appraise evidence 44.1% ($n = 166$); and apply information 40.4% ($n = 152$). However, reported knowledge level was not consistent across the different steps of the evidence-based practice process. For example, only 19.7% ($n = 74$) of respondents reported the ability to convert information needs into a research question as *very good* or *excellent* while nearly 50% ($n = 186$) reported the ability to apply evidence at the same level.

Table 5. Self-reported Evidence-based Practice Knowledge

Evidence-based Practice Component	Reported Knowledge or Skill Level (N = 376)									
	Poor		Fair		Good		Very Good		Excellent	
	n	%*	n	%*	n	%*	n	%*	n	%*
Ability to convert needs to question	21	5.6	127	33.8	149	39.6	60	16.0	14	3.7
Knowledge of how to retrieve evidence	10	2.7	78	20.7	148	39.4	110	29.3	26	6.9
Ability to critically analyze evidence	13	3.5	89	23.7	166	44.1	81	21.5	23	6.1
Ability to apply information	2	0.5	30	8.0	152	40.4	140	37.2	46	12.2

*Percentages may not equal 100% as not all respondents answered all questions

Respondent Characteristics and Evidence-based Practice Knowledge

There were differences in evidence-based practice knowledge between highest degree groups for three of the components of evidence-based practice examined in this study (Table 2). Post hoc testing (Table 3) revealed that those respondents with the Doctor of Physical Therapy degree ranked knowledge for each of these evidence-based practice components higher than respondents with bachelor or master as highest degree. There were no differences in self-reported evidence-based practice knowledge and skills between age groups (Table 2).

Differences in self-reported knowledge for three evidence-based practice components existed based upon association membership status (Table 4): ability to convert needs to a question ($z = 2.188, p = .03$); ability to determine how useful information is ($z = 2.398, p = .02$); and ability to apply information ($z = 2.555, p = .01$). Those who were association members ranked knowledge in these three component areas higher than non-members. There were differences in self-reported knowledge based upon American Board of Physical Therapy Specialties certification for all four components examined (Table 4). Those with certification ranked knowledge higher than those without.

DISCUSSION

This is the second of two papers addressing physical therapist clinical instructor evidence-based practice. The current paper describes the self-reported evidence-based practice beliefs and knowledge of respondents and the differences in self-reported beliefs or knowledge that exist, if any, between groups based on highest degree, age, association membership, and specialty certification.

Evidence-based Practice Beliefs

Consistent with the results of other studies reporting evidence-based practice beliefs of physical therapists in the United States, many of the respondents in the current study reported positive beliefs about evidence-based practice.³⁻⁵ However, it is relevant to note that in spite of the many positive responses, not all respondents consistently held positive beliefs about evidence-based practice. For example, although a majority of the respondents reported evidence-based practice as *fundamental to practice*, over half of the respondents reported *neither agree or disagree*, *disagree*, or *strongly disagree* to the statement that *new evidence is important I make time*. Some respondents reported agreement with the statement about evidence-based practice being a waste of time. Although the majority of respondents disagreed with the statement *evidence-based practice is a waste of time*, only approximately one-third of respondents agreed with the statement *new evidence is important I make time*. Others disagreed that their practice changed because of evidence. It is possible that respondents do not feel evidence-based practice is important, but the responses to this question could also perhaps reflect a paucity of new evidence in the area of clinical practice of certain clinicians that influenced how the respondents rated this question.⁴

Evidence-based Practice Knowledge

Previous studies reported a lack of confidence in two skills, searching for and critically appraising evidence, as barriers to evidence-based practice.^{3,7} In the current study the most frequent response for knowledge of skills supporting evidence-based practice in this study was *good*, including searching for and critically appraising evidence. However, the percentage of those reporting the ability to critically appraise evidence as *very good* or *excellent* was lower than in the other three categories. Respondents reported

the highest knowledge levels for the ability to apply information (evidence). The highest percentage of *fair* and *poor* ratings was reported for the ability to convert needs to a question in the current study.

Respondent Characteristics and Evidence-based Practice

Jette et al reported that other than years since licensure, demographics characteristics were not associated with beliefs or attitudes about evidence-based practice.³ The results of the current study differ from these findings. There were differences in beliefs among the groups for Doctor of Physical Therapy as highest degree, American Physical Therapy Association membership, and American Board of Physical Therapy Specialties certification. For example, all three groups ranked the statement on evidence-based practice being a waste of time lower (stronger level of disagreement) than those who were not in these groups. Those respondents who were American Physical Therapy Association members or held an American Board of Physical Therapy Specialties certification rated that practice had changed because of evidence higher than respondents not in these groups.

From earlier studies, self-reported evidence-based practice knowledge was associated with professional or advanced degrees, age and American Physical Therapy Association membership.^{3,6,7,11} Physical therapists with a certificate or baccalaureate degree as their first-professional degree reported lower levels of knowledge than those with higher degrees.^{3,6,7} Of those who went on to earn advanced degrees (Doctor of Physical Therapy, Doctor of Health Science or Doctor of Science in physical therapy, or Doctor of Philosophy in physical therapy), 87% indicated the advanced degree enhanced evidence-based practice use.¹¹ Degree was also reported to be positively associated with the proclivity to adopt evidence-based practice.¹² A negative association between age and evidence-based practice knowledge was previously reported.^{3,7}

The results of the current study support earlier findings of a positive association between degree, association membership, and evidence-based practice knowledge.³ Respondents with a Doctor of Physical Therapy degree or who were association members reported higher levels of knowledge than those with a lower degree or non-members. Respondents who held the Doctor of Physical Therapy degree ranked the ability to formulate a question, retrieve evidence, and analyze evidence higher than others. Association members ranked the ability to formulate a question and apply information (evidence) higher than nonmembers. Those respondents with a specialist certification ranked knowledge of all evidence-based practice components higher than those without certification. Unlike earlier studies, there was no difference in evidence-based practice knowledge based upon age in the current study.

Implications for Evidence-based Practice in Physical Therapy Clinical Education

Based upon the results of this study, one could hypothesize that the ideal clinical instructor to role model evidence-based practice for student physical therapists would be a member of the American Physical Therapy Association and hold both a Doctor of Physical Therapy degree and an American Board of Physical Therapy Specialties certification. However, the results of an earlier study give reason to dispute this hypothesis.¹³ From a survey of physical therapists who were members of three sections of the American Physical Therapy Association, Fell et al reported that those with the Doctor of Physical Therapy degree and those practicing ≤ 15 years were likely to report relying upon resources that were evidence-based less frequently than those with lower degrees or more years of experience, instead relying upon colleagues as an information source.¹³ Although those holding a Doctor of Physical Therapy degree who were more recent graduates and may have had more evidence-based knowledge, the lack of clinical expertise, a necessary part of the evidence-based practice process, may have caused them to turn to colleagues rather than using literature as a source of information. The sample from the earlier study was different from the current sample. All respondents in the study by Fell and colleagues were members of one of three sections of the American Physical Therapy Association.¹³ Differences in the samples may account for the variation in results. It must also be considered that viewing the demographics of respondents in the current study, the majority of clinical instructors hold other than the Doctor of Physical Therapy degree and are neither members of the American Physical Therapy Association nor certified as specialists.^{3,6,14,15}

From the current study, one must also consider that not all clinical instructors are likely to be effective role models in evidence-based practice for student physical therapists. Some reported negative beliefs or attitudes about evidence-based practice, which could negatively influence student perceptions.² Also reported were knowledge deficits, which will limit the clinical instructors' ability to instruct or demonstrate use of evidence-based practice for students. A clinical instructor may not use and/or teach the use of evidence if confidence or competence is lacking.⁷ Only slightly above one-quarter of participants ($n = 104$; 27%) reported the ability to critically appraise evidence as higher than *good* while nearly one-half ($n = 186$; 49.2%) reported as higher than *good* the ability to apply information. These results lead one to question how physical therapists who are clinical instructors use evidence-based practice. A common misconception exists, "that evidence-based practice simply involves reading and applying the research" when it actually "requires critical appraisal of literature and quantifying the clinical relevance."^{16p.4} From the results of the current study, it is not possible to determine if participants are reading and applying literature without appraisal, or perhaps relying on evidence appraised by other reliable sources so appraisal is not always needed.^{1,3,16,17} Additional research exploring how evidence-based

practice is used will provide valuable insight into how, during clinical experiences, students will be exposed to evidence-based practice.

Student evidence-based practice assignments during clinical experiences, directed by academic faculty with contemporary expertise in evidence-based practice, could promote student exposure to and use of evidence-based practice during actual patient encounters.¹⁸ If clinical instructors are actively involved as students work on these assignments, students may be able to share knowledge and information with clinical instructors who lack evidence-based practice knowledge or confidence. Physical therapy programs could offer educational sessions for clinical instructors to address knowledge and to foster an understanding of the benefits of evidence-based practice such as improved outcomes, patient satisfaction, and safety.^{19,20}

Limitations

The low response rate (26%) is a limitation of this study. The use of self-reported data also limits this study, since self-reported beliefs and knowledge may differ from actual beliefs and knowledge. Bias could exist if respondents over-reported beliefs or knowledge to reflect ideal rather than actual. Bias may have also occurred in the event some of those requested to participate, without education or training in evidence-based practice, decided the survey was not relevant and did not participate. This would result in an over-representation of evidence-based practice knowledge. Finally, although the sample was randomly drawn from a database widely used by physical therapist education programs, the use of a nonprobability sampling technique, convenience sample, could have resulted in sampling bias.

CONCLUSION

Most respondents in this study had positive beliefs about evidence-based practice. However, some respondents reported negative beliefs such as disagreeing that new evidence is important. There were wide variations in evidence-based practice knowledge reported. The largest percentage of respondents rated knowledge as *good*, the middle or “average” rating on the five-point scale. There were differences in evidence-based practice beliefs and knowledge between groups for highest degree, association membership, and specialty certification.

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APPENDIX

Clinical Effectiveness and Evidence Based Practice Questionnaire (EBPQ)

This questionnaire is designed to gather information and opinions on the use of evidence based practice among physical therapists who are clinical instructors. There are no right or wrong answers for we are interested in *your* opinions and *your* own use of evidence in *your* clinical instruction of student physical therapists.

1. Some information about you:

What is your gender:

- Male Female

What is your age range:

- 20 – 29 30 – 39 40 – 49 50 – 59 60 – 69 70 or over

In which state are you currently a clinical instructor: _____

In what setting are you a clinical instructor:

- Acute care hospital (inpatient)
 Inpatient rehabilitation hospital
 Skilled nursing facility
 Outpatient – hospital based
 Outpatient – private practice
 Outpatient – corporation owned
 Outpatient – physician owned
 Home health
 School system
 Other – specify: _____

What is your entry physical therapy degree:

- Certificate
 Bachelor
 Master
 Doctorate

What year did you earn your entry physical therapy degree: _____

What is your highest degree held:

- Certificate
 Bachelor
 Master
 Doctorate in Physical Therapy
 Other Doctorate

What year did you earn your highest degree: _____

The number of years of experience you have as a clinical instructor for student physical therapists:

- Less than 1 1 - 5 6 – 10 11 – 15 16 – 20 21 – 25 26 – 30 Over 30

The number of physical therapist students you have supervised as a clinical instructor in the past year:

None 1 2 3 4 5 6 7 8 9 or more

Are you an American Physical Therapy Association member:

Yes No

Are you an American Physical Therapy Association Credentialed Clinical Instructor:

Yes No

Are you an American Board of Physical Therapy Specialties certified clinical specialist:

Yes No

2. As a clinical instructor, over the *past year*, how often have you done the following in response to a gap in your knowledge:

Formulated a clearly answerable question as the beginning of the process towards filling this gap:

Never Rarely Occasionally Sometimes Frequently

Tracked down the relevant evidence once you have formulated the question:

Never Rarely Occasionally Sometimes Frequently

Critically appraised, against set criteria, any literature you have discovered:

Never Rarely Occasionally Sometimes Frequently

Integrated the evidence you have found with your expertise:

Never Rarely Occasionally Sometimes Frequently

Evaluated the outcomes of your practice:

Never Rarely Occasionally Sometimes Frequently

Shared this information with colleagues:

Never Rarely Occasionally Sometimes Frequently

3. As a clinical instructor, please indicate where on the scale you would place yourself for each of the following statements:

New evidence is so important that I make the time in my work schedule:

Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree

I welcome questions on my practice:

Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree

Evidence based practice is fundamental to professional practice:

Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree

My practice has changed because of evidence I have found:

Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree

My workload is too great for me to keep up to date with all the new evidence:

Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree

I resent having my clinical practice questioned:

Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree

Evidence based practice is a waste of time:

Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree

I stick to tried and trusted methods rather than changing to anything new:

Strongly Disagree Disagree Neither Agree or Disagree Agree Strongly Agree

4. As a clinical instructor, how would you rate your:

	Poor	Fair	Good	Very Good	Excellent
Research skills	1	2	3	4	5
IT skills	1	2	3	4	5
Monitoring and reviewing of practice skills	1	2	3	4	5
Converting your information needs into a research question	1	2	3	4	5
Awareness of major information types and sources	1	2	3	4	5
Ability to identify gaps in your professional practice	1	2	3	4	5
Knowledge of how to retrieve evidence	1	2	3	4	5
Ability to analyze critically evidence against set standards	1	2	3	4	5
Ability to determine how valid (close to the truth) the material is	1	2	3	4	5
Ability to determine how useful (clinically applicable) the material is	1	2	3	4	5
Ability to apply information to individual cases	1	2	3	4	5
Sharing of ideas and information with colleagues	1	2	3	4	5
Dissemination of new ideas about care to colleagues	1	2	3	4	5
Ability to review your own practice	1	2	3	4	5