



Evidence-based practice in Physiotherapy curricula: A survey of Indian Health Science Universities

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Abstract

Introduction: Evidence-based practice (EBP) is the conscientious, explicit and judicious use of the current evidence in clinical decision making. The physiotherapy profession has expressed a commitment to the development and use of evidence. However, very little is known about the extent to which EBP is integrated in physiotherapy curricula in India. The purpose of this study was to describe integration of EBP in Indian physiotherapy programs.

Methods: An observational study was conducted where a review of curricula of all Health Science Universities (HSU) in India, offering an undergraduate (UG) and post-graduate (PG) degree program in physical therapy was conducted using a data abstraction sheet. It gathered data on inclusion of research components of EBP in the curricula, content and hours of teaching EBP, and assessment methods. Data were analyzed descriptively.

Results: Curricula of fifteen HSU offering physiotherapy programs were reviewed. Contents relevant to EBP were incorporated from the 2nd yr to final year. Common courses included research methodology (84.61%), research project (69.23%) and clinical management subjects (57.14%). No guidelines were given about adopting EBP in clinical practice. Didactic lectures were the mode of teaching (81.81%). Preferred method for assessing research projects was viva (44.44%). Critical appraisal was least included in the entry level education. Contents relevant to all the five steps of EBP were included in PG curricula.

Conclusions: Though physiotherapy programs are introducing EBP teaching at the entry level, it lacks structured systematic approach and is fragmented. There is inadequate emphasis on clinical oriented teaching of EBP and assessment methods. Moreover, there is adequate coverage of EBP content in PG curricula.

Keywords: Evidence based practice; Physiotherapy; Curriculum

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Introduction

David Kern from John Hopkins University in his book 'Curriculum planning for medical education' defines "curriculum" as a planned educational experience (1). Evidence-based practice (EBP) education of undergraduate health professionals has become a focus for curricular

development in medicine, nursing and a range of allied health professions. Globally, physiotherapy profession has transited from the traditional towards a more practical and functional evidence-based practice (2).

Evidence based practice as defined by Sackett involves three components: the integration of 1)

the best research evidence together; 2) patient values; and 3) clinical expertise (3). Physical therapists have a responsibility to use evidence to inform practice and ensure that the management of patients is based on the best available evidence. They also have a responsibility not to use techniques and technologies that have been shown to be ineffective or unsafe [WCPT Strategic plan, 2011-2015] (4).

It has previously been reported that health professionals such as physiotherapists spend little time reading clinical research, and predominantly use techniques and strategies acquired during their entry-level training (5). A study conducted on Indian physiotherapy practitioners showed that 43% used their past experiences to decide treatment strategies (6). Inadequate educational preparation has been a consistent barrier to the use of EBP which consequently emphasizes the need for effective education (7-11).

Healthcare system and policies that drive practice impact education in India. With the rise of medical tourism, changing healthcare delivery system, and autonomy in decision making, it is important for the curricula to include evidence-based practice. In the absence of definite guidelines given for curriculum formation, there exists no uniformity of physiotherapy curricula across India with varied nomenclature, duration, content, training methods, assessment patterns, in various Universities.

According to the Sicily Statement, it has been proposed that EBP involves a five step process: Ask, Acquire, Appraise, Apply and Assess (11). Given that EBP is the professional standard today, it is important to assess which of the above EBP steps are implemented and systematically utilized in our graduate (UG) and post-graduate (PG) education. There is no information about the extent to which the above steps of EBP are integrated in physiotherapy educational curricula in India. The aim of this study was to describe the inclusion of research evidence component of EBP in Indian physiotherapy programs.

Methods

All Health Science Universities (HSU) offering physiotherapy programs in India were identified from the University Grants Commission (UGC) website after permission from the Institutional Review Board and Ethical committee of Mahatma Gandhi Mission's Institute of Health Sciences, Navi Mumbai. Curricula which were available online were downloaded. The remaining universities were contacted in writing through emails and by personal telephone contact with the institutions.

The curricula were studied in detail by VP. A desk review of these curricula was conducted using a data abstraction sheet. This sheet was validated for content by three physiotherapy experts, with a teaching experience of more than 20 years and MGM Institute of Health Sciences Tool validation committee. The data abstraction sheet gathered information on inclusion of research component of EBP, specific EBP content, credit points or hours, subject headings, teaching and evaluation methods of each HSU.

The knowledge and skills required for five steps of EBP were looked for as follows:

1. Ask: Formulation of research question, PICO (patient-intervention-comparator-outcome measures) format

2. Acquire: Knowledge of search engines/databases, Literature search

3. Appraise: Inclusion of Levels/hierarchy of evidence, Types of study designs, Types of validity & reliability, Tools of critical appraisal, Inclusion of Statistical methods.

4. Apply: Application of evidence in clinical decision making

5. Assess: Ability to self reflect on how well the previous four steps were performed

Data were entered into Microsoft Excel 2010, and descriptive analysis was done using SPSS Version 16.0. Chicago, SPSS Inc.

Results

Health universities data

Out of the 15 Health Science Universities offering physiotherapy programs in India, 10 (66.67%) were State Universities and 5 (33.33%) were Deemed Universities. UG curricula of 13 (86.6%) HSU & PG curricula of 12 (80%) were available at the time of analysis. Two HSU did not send their UG & PG curricula even after two reminders and one HSU sent its UG curriculum only. One HSU did not send their entire curriculum but sent only highlights of the UG program. Characteristics of HSU is described in Table 1

It was seen that 7 (46.67%) UG and 6 (40%) PG curricula were available online. The remaining 6 UG and 6 PG curricula were obtained through emails from respective Universities. 53.84% (7) of HSU had the term evidence-based practice included in their UG curricula, of which 3 (42.85%) had it as a separate topic and 4 (57.14%) had a casual mention in the clinical subjects (Musculoskeletal, Neurological, Cardio-respiratory and Community Physiotherapy) and electrotherapy. In the PG curricula, 8 (80%) HSU had the term EBP, 2 (25%) as a separate topic, 5 (62.5%) under clinical subjects, and 1 (12.5%)

Table 1: Characteristics of Health Science Universities

Sr No	Item	N (%)
1	Type of HSU:	
	State-level University	10 (66.67%)
	Deemed University	5 (33.33%)
2	Zonal distribution of HSU: (as per zones given by per Inter-State Council Secretariat: Ministry of Home Affairs, Govt of India.)	
	Northern Zone	3 (20%)
	Central Zone	1 (6.7%)
	Western Zone	4 (26.7%)
	Eastern Zone	1 (6.7%)
	Southern Zone	6 (40%)
	North eastern Zone	0 (0%)
3	Online availability of curricula:	
	UG	7 (46.67%)
	PG	6 (40%)
4	Duration of course (UG n:13, PG n: 11)	
	UG: 4.5years	13 (100%)
	PG: 2 years	10 (90.9%)
	PG: 3 years	1 (9.09%)
5	Nomenclature	
	BPT/MPT	11 (84.62%)
	BPTh/MPTh	2 (15.38%)

under goals of the course.

Subjects under which EBP was incorporated

Content relevant to EBP was taught in the subject research methodology in 10 (76.92%) of the UG curricula which was included in the 2nd year (30%), 3rd year (20%), and 4th year (50%).

69.23% of the HSU which had the subject research methodology had a research project. Out of them, 55.56% had included a research project in the fourth year, 33.33% had synopsis preparation in the final year and data collection in internship, and 11.11% had projects in both 4th year and internship. Similarly in the PG curriculum, all HSU had the subject research methodology as well as a dissertation.

EBP content

In the majority of UG curricula, contents relevant to the first two steps of EBP were taught (Table 2) and PG curricula covered all the steps.

75% of the universities included the 1st step of EBP, i.e. formulation of research question; however, the PICO (patient/population + intervention + comparator + outcome) format was excluded. In the 2nd step of EBP, literature search was included by the majority (58.3%) of HSU without introduction to the search strategy and training on how to do it.

The least taught content was in the area of critical appraisal and only 16.6% of the universities included the tools of critical

appraisal. Knowledge about the levels/hierarchy of evidence, interpretation of confidence interval, knowledge of odds ratio, number needed to treat, and effect size was not included in the majority of the curricula.

Teaching/training methods

Didactic lecture (81.81%, 9/11) was the method of choice for teaching in most of the HSUs, expect for one which also incorporated seminars. The teaching hours allotted in a year ranged from 20 hours-60 hours in the UG curricula and 50 hours – 360 hours in the PG curricula (Table 3).

Journal club/Critiquing a research article was included in all the PG curricula, but the hours allotted were not specified by any HSU. Students were marked in their abilities to understand the scope/need and objectives of the study, comment on the use of appropriate outcome measures and study design, ability to understand the statistical methods used, and interpret the significance of p-value.

Evaluation methods

Out of the three HSUs which had EBP as a separate subject heading, the assessment pattern was varied as University exam of 100 marks, college exam and no exam. Other HSUs conduct an examination in the subject research methodology (Table 4) out of which 40% conduct a University exam and 40% conduct college exam. Written assessment methods included distribution of marks for project presentation in

Table 2: EBP content taught in physiotherapy programs

EBP content	Undergraduate (UG)	Postgraduate (PG)
	n (%)	n (%)
ASK:		
Formulation of a research question	9 (75%)	11 (100%)
PICO format	0 (0%)	0 (0%)
ACQUIRE:		
Knowledge of search engines/databases	6 (50%)	9 (81.8%)
Literature search	7 (58.3%)	10 (90.9%)
APPRAISE:		
Levels/hierarchy of evidence	2 (16.6%)	5 (45.4%)
Types of study designs	8 (66.6%)	11 (100%)
Types of validity	5 (41.6%)	9 (81.8%)
Types of reliability	5 (41.6%)	9 (81.8%)
Tools of critical appraisal	2 (16.6%)	3 (27.2%)
Interpreting t-test, ANOVA, Chi-square test	7 (58.3%)	11 (100%)
Interpreting p-value	7 (58.3%)	11 (100%)
Interpreting confidence interval	4 (33.3%)	5 (45.4%)
Understanding odds ratio, numbers needed to treat	0 (0%)	0 (0%)
What is systematic review/meta analysis	2 (16.6%)	8 (72.7%)
APPLY:		
Application of evidence in clinical decision making	0 (0%)	9 (81.8%)
ASSESS		
Ability to self reflect on how well the previous four steps were performed	0 (0%)	9 (81.8%)

Table 3: Teaching/training and evaluation method in the subject research methodology

Sr. No.	Item	n=10 (%)
1	UG training hours:	
	20 hours	1 (10%)
	25 hours	1 (10%)
	30 hours	3 (30%)
	50 hours	2 (20%)
	60 hours	3 (30%)
2	PG training hours:	
	50 hours	1 (10%)
	60 hours	2 (20%)
	100 hours	2 (20%)
	360 hours	1 (10%)
	Could not locate (CNL)	4 (40%)
3	Type of exam:	
	University exam (100Marks)	4 (40%)
	College exam (internal assessment) (50Marks)	4 (40%)
	No exam	2 (20%)
4	Project evaluation UG: (n=9)	
	Viva	4 (44.4%)
	Grades	0 (0%)
	Logbook	1 (11.1%)
	CNL	4 (44.4%)
5	Dissertation evaluation PG:	
	Viva	5 (50%)
	Submission mandatory	3 (30%)
	Approval mandatory	2 (20%)

the UG curricula and dissertation in PG.

Scanning of question papers revealed that the questions asked in final year clinical subjects had long essay type questions with emphasis

on problem based learning (PBL) in most of the HSUs. Questions demanded an answer in the form of treatment protocol for a specific condition.

Table 4: The five step process of EBP and the minimum skill set required for competency at each of the steps (11)

1. Translation of clinical uncertainty to an answerable question
<ul style="list-style-type: none"> • identification of knowledge gaps during clinical practice • formulation of focused questions (PICO: participants-intervention-control/comparator -outcome) that lead to effective search and appraisal strategies
2. Search for and retrieval of evidence
<ul style="list-style-type: none"> • ability to design and conduct an effective and comprehensive search strategy to answer the question • understanding the strengths and weaknesses of the different sources of evidence
3. Critical appraisal of evidence for validity & clinical importance
<ul style="list-style-type: none"> • ability to appraise the validity of a study • appraisal will include the suitability of the study design to the question, sources of bias, reliability of outcomes, and the suitability and robustness of the statistical analysis
4. Application of appraised evidence in practice
<ul style="list-style-type: none"> • ability to assess the relevance of the appraised evidence to the need that prompted the question • exploration of patient values and the acceptability of the answer
5. Evaluation of performance
<ul style="list-style-type: none"> • ability to self reflect on how well the previous four steps were performed

Discussion

Our study showed that there was inclusion of competencies for steps 1 and 2 of EBP at entry level (UG) and steps 1-5 at PG level in Indian physiotherapy programs, in varying degrees and ways. However, it is not delivered in a systematic and structured manner to improve the EBP understanding of students. A previous study done on EBP practices amongst physiotherapy practitioners in India showed that the inclusion of foundations of EBP in the entry level education of these practitioners was found to be inconsistent (6). The current study showed that the inclusion of EBP was rather inconsistent. Agarwal et al. have suggested that effective education might be the most powerful tool in overcoming the barriers of EBP in India (12). Therefore, well structured educational programs are needed to be designed for effective delivery of EBP education.

It was observed that the majority of the courses had included some elements of statistics and epidemiology with emphasis on research techniques and statistical calculations rather than application of research to clinical decision making and patient problem solving. It was also seen that there was an overlap between research and EBP, and areas that were distinct to each one were not clearly mentioned in the curriculum.

According to the Sicily statement, the knowledge, skills and attitudes required for evidence-based practice should be an essential component of the undergraduate education of health professionals (11). The knowledge and skills (competencies) required for practice of EBP (as shown in Table 4) were partly included in the UG and PG curricula but attitudes for EBP practice could not be commented upon in this present study.

The content relevant to EBP was incorporated

from the 2nd year to final year in the entry level programs under the subject research methodology in the majority of the curricula. Previous studies have shown that incorporating EBP under research methodology and under clinical management subjects is common as specific research knowledge and skills form a foundation for EBP (13-16).

The majority of HSUs had integrated EBP but its implementation varied, which could be because of lack of professional mandate. In the entry level programs, the students were taught to formulate a research question as required by the 1st step of EBP, but they were not made aware of the PICO format. If formulation of research question is taught to students in the clinical area using the PICO format, it will improve their understanding rather than delivering this in a theoretical class. Studies have shown that EBP courses integrated with clinical practice improve knowledge, skills and attitudes required for practice of EBP (17). Most of the HSUs have mentioned in their course objectives that patient treatment should be based on the best research evidence but no detailed guidelines are given on how to link evidence to practice. No guidelines were given in the curriculum about adoption of EBP during clinical training which shows inadequate emphasis on clinical oriented teaching and assessment methods.

Knowledge of search engines/databases and literature search which was part of the 2nd step of EBP is incorporated by most of the HSU, but curriculum did not demand a practical demonstration. The teaching method suggested by Dawes et al. for this step was theoretical instruction followed by practical demonstration so that students could be guided during searching literature and retrieving evidence (11).

Though the knowledge of the types of study designs, types of validity/reliability, interpretation of t-test, ANOVA, Chi-square test, interpretation of significance of p-value, confidence interval was delivered by most of the HSUs, concepts required for actual understanding of the best research evidence like odds ratio, effect size, number needed to treat were not included by any HSU. This shows that there is no formal critical appraising training imparted to entry level physiotherapy students, which explains the absence of research activities like journal club, journal review, etc. in the entry level curriculum. This might lead to inability in finding the best research evidence in clinical settings and using EBP in clinical decision making by these students as independent practitioners.

The preferred mode of teaching in the majority of the HSU was didactic/theoretical lecture which will not develop higher order thinking skills necessary for evidence-based decision making. Gorgon et al. have shown that since EBP involves complex knowledge, understanding and skills that take time to develop, EBP education should integrate multiple factors, have multiple layers of teaching and evaluation, and allow students time to develop their thinking and decision making skills (18). For improved and better understanding of EBP, it needs to be integrated with clinical teaching. Studies done by Chuang et al. have emphasized that teaching students in clinical settings through informal and hidden curriculum influences their behaviors (19). Agarwal et al. have rightly said that it is the clinical teacher who needs to tell the students the basis of decision making (12). Coomarasamy and Khan's (2004) systematic review has also reported that clinically integrated courses improve knowledge, skills, attitudes and behaviors pertaining to EBP (17).

The challenges to practically engage in evidence-based practice have been reviewed previously, mainly being clinician's lack of time, access to literature, and skill in critical appraisal. There has also been discussion of barriers to teaching evidence-based practice. These include a lack of skill in critical appraisal on the part of academic and clinical faculty, the lack of high-quality evidence in the literature to answer clinical questions, and resistance to modifying teaching methods (6, 20-22).

The majority of the HSUs conducted a university level written exam in the subject research methodology which is indicative of the positive attitudes of educators of HSU towards research. The inclusion of PBL further develops the concept of clinical decision making in the clinical subjects; this has a further scope with

an added emphasis on best research evidence.

It was seen that entry level students were also involved in research projects. Projects done by UG students were evaluated on the basis of their understanding of research methods, literature review and justifying the need of the study. The preferred mode of evaluation was viva or oral examination which will definitely enhance critical thinking and self confidence. It will also develop skills to organize, analyze, interpret, evaluate, justify and defend. All these qualities have been stated as essential in the development of conducive environment for EBP (20).

Currently, EBP teaching has called for refocusing of teaching of research and statistics from 'doing research' to one of 'using research' to inform clinical decisions by finding the best research evidence (Evidence-Based Medicine Working Group 1992) (21). Thus, students have to be instructed on how to use the best research evidence found for application in their context.

In their study, Ross et al. have very rightly said that, in traditional research class, the following questions were asked about an article: 1) Have the authors stated their research question/hypothesis clearly, and is it one of importance to the profession? 2) Is the question based on a sound theoretical framework? 3) Has the right design been used to answer the question? 4) Does the design ensure good experimental control? 5) Are the authors' conclusions reasonable given the results? If we contrast these with the EBM questions developed by Sackett et al., the questions fall into three main categories: 1) Are the results of the study valid? 2) Are the valid results of the study important? 3) Are these valid, important results applicable to the patient in question? The questions in the first category are specific questions about aspects of the design necessary to ensure good experimental control; those in the second category are generally about the magnitude of the result; those in the third category are related to the clinical decision-making aspect of EBM (23).

There is a need to find out why EBP was not systematically placed in most of the UG programs and investigate the educational needs of PT faculties in EBP and teaching EBP. Thus, this study highlights the urgent need of HSU in incorporating EBP in their existing entry level curricula.

Limitations

This study included a desk review, so the recent updated online documents and those sent by respective HSU were scanned for necessary information. We did not have access to any instructions given by HSU in terms of practical

approach to clinical subjects which were not documented in their curricula.

Conclusion

Physiotherapy curricula of many HSUs in India include the various competencies for research evidence component of EBP teaching at entry level. However, it lacks a structured systematic approach and there is inadequate emphasis on clinical teaching. These findings highlight the need to develop appropriate entry-level educational programs on EBP. To be on a par with global standards, Health Science Universities have a responsibility to encourage the students to promote and deliver evidence-based practice from the onset of training which should be included as ongoing education, to ensure that patients receive high-quality care.

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