Chapter 7: Discussion

This research was conducted in three phases which explored the integration of skills and training of EBP in Physiotherapy education. The initial phase was to find out the current structure of EBP content in Physiotherapy programs. An educational needs assessment on the training of EBP was conducted in phase II by conducting semi-structured interviews. An educational need assessment can be defined as the gap between what is currently known by the students and what should be known by them.\textsuperscript{104,105} Whereas, in phase III, through Delphi process, we identified the elements that helped in developing a module on EBP.

Our primary study conducted on EBP practices amongst physiotherapy practitioners in India had shown inconsistent inclusion of foundations of EBP at the entry level education. In this research study too, wide variations and ways of competencies were found to be currently included for step 1 and 2 of EBP at entry level (UG) and steps 1-5 at PG level in Indian Physiotherapy programs indicating that reforms in the delivery of EPB training are overlooked even in the current education.\textsuperscript{10}

Agarwal et al suggested that systematic education was the most powerful tool for overcoming the barriers of EBP in India.\textsuperscript{107,10} Therefore, the need of designing, well structured and systematic educational programs was strongly felt with regards to effective delivery of EBP education.

In this study, it was observed that there was inclusion of statistics in majority of the courses which emphasized on statistical calculations and techniques rather than application of the same to clinical decision making & patient problem solving. It was also seen that there was an distinct overlap between research and EBP, and the areas exclusive to each one were not clearly mentioned in the curricula.\textsuperscript{10}
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. In our study, the knowledge and skills (competencies) required for practice of EBP were found to be partly included in the UG and PG curricula but it was difficult to comment on “attitudes” since clarity of this component lacked in the curricula.

The content relevant to EBP was found to be incorporated under the subject research methodology in majority of the curricula from as early as 2nd year to final year in the entry level programs. Previous studies have also shown that EBP is very commonly included under the subjects research methodology and clinical management subjects, as specific research knowledge and skills form a foundation for the training of the five steps of EBP.

Majority Universities were found to have integrated the key skills of EBP but its implementation varied which could be because of lack of professional mandate. It was observed that the 1st step of EBP, formulation of a research question, was included but awareness about PICO format was found to be missing. Therefore the need of inclusion of PICO format in the clinical set-up was strongly felt which will improve students’ understanding of practical application of first step of EBP, rather than delivering this in a theory class.

Dawes et al (2005) have recommended five step process of EBP and the minimum skill set required for competency at each step (Refer Table 5.1)
Table 7.1: The five step process of EBP and the minimum skill set required for competency at each step\textsuperscript{7,10}

<table>
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<th>Step</th>
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| 1. | Translation of clinical query to an answerable question  
| • | to identify knowledge gaps during clinical practice  
| • | to formulate focused questions (using PICO: participants-intervention-control/comparator-outcome) |
| 2. | Search and retrieve evidence  
| • | ability to perform an effective and comprehensive search strategy to answer the query  
| • | to understand the strengths and weaknesses of the different sources of evidence found |
| 3. | Critically appraising the found evidence  
| • | ability to appraise the validity and reliability of a study  
| • | It will include the verification of suitability of the study design to the clinical query, any evident sources of bias, reliability of outcomes measures used, and the accuracy and robustness of the statistical analysis |
| 4. | Applying appraised evidence in practice  
| • | ability to assess the relevance of the appraised evidence  
| • | knowing patient values and the acceptability of the evidence in current scenario |
| 5. | Assessment of performance  
| • | ability to self reflect on how well the previous four steps were performed |

Literature has shown EBP courses integrated with clinical practice improve knowledge, skills and attitudes required for practice of EBP.\textsuperscript{10,109} In our study it was observed that most of the Universities have mentioned in their course objectives that patient treatment should be based on best research evidence but no
detailed guidelines were found on how to link evidence to practice. Since guidelines were not found in the curriculum about adoption of EBP during clinical training, the need of such inclusion with adequate emphasis on clinically oriented teaching and assessment methods was very much justified.10

Knowledge of research engines/databases & literature search which is part of the 2nd step of EBP was found to be incorporated in the curricula by most of the Universities, but demand for practical demonstration was not found. The teaching method suggested by Dawes et al for this step is theoretical instruction followed by practical demonstration of the technique so that students can be guided during searching literature and finding evidence. 7, 10

Though the knowledge of different types of study designs, types of validity & reliability, interpretation of significance of p-value, interpretation of t-test, ANOVA, Chi-square test, was delivered by most of the Universities but concepts required for actual understanding of the clinical significance of a study and for finding the best research evidence like odds ratio, effect size, number needed to treat was found to be missing. Therefore, based on this observation an inference was drawn that, owing to the prevailing absence of formal training in critical appraisal, research activities like journal club, are missing in the entry level curricula. It is likely that it would cause difficulty in searching the best research evidence during clinical decision making by the students as independent clinicians. 10

It was also observed that, those curricula that included ‘evidence based management’ in the clinical subjects did not mention about finding best research evidence; neither did they emphasize on the need to look into current best evidence from systematic research.
In our study, it was observed that the preferred mode of teaching EBP was in the form of a didactic/theoretical lecture in the classroom which is likely to restrict development of higher order thinking skills necessary for evidence based decision making. As per Gorgon et al, the entire process develops slowly since EBP involves complex knowledge and detailed understanding of each of the steps, acquiring all these skills take time. Thus EBP education should have many layers of teaching and assessment, it should integrate various factors, which will allow students time to develop their thinking and decision making skills. For improved and better understanding of EBP it needs to be integrated with clinical teaching. Chuang et al have emphasized the need of clinical integration of EBP through informal and hidden curriculum in clinical settings, which is essential as it has an influence on student behavior. It is rightly said by Agarwal et al that it is the clinical teacher who teaches the basis of clinical decision making in clinics. A systematic review by Coomarasamy and Khan (2004) also reported that courses which were clinically integrated showed improvement in knowledge, skills, attitudes and behaviors related to EBP.

The challenges to practically engaging in evidence-based practice have been previously reviewed, and reported lack of time, inadequate access to literature and lack of skills 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 a resistance to modifying teaching methods. In this study it was found that majority of the universities conducted a university level written exam in the subject “Research methodology” which indicated positive attitudes of educators towards research. Assessing a topic in the form of a written...
exam emphasizes the importance. Therefore it was strongly felt that integrating this knowledge with inclusion of problem based learning (PBL) would further develop the concept of clinical decision making in the clinical subjects; having further scope to emphasize on best research evidence.\textsuperscript{10}

In this study we also observed that entry level students were involved in research projects which were evaluated on the basis of their understanding of research methods, literature review and justifying the need of the study. Preferred mode of evaluation was viva or oral examination which was felt to definitely enhance critical thinking & self confidence and enable the candidate to 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.\textsuperscript{10, 112}

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).\textsuperscript{12} To do the same, students are needed to be taught to ‘read research’ articles published in scientific journals, to critically analyze and interpret to know wheat from chaff, and then use the best evidence after verifying applicability on patients.\textsuperscript{10}

In their study, Ross et al have very rightly said that, in traditional research class, the questions that were asked about an article emphasized on the importance of hypothesis, its theoretical framework, study design, experimental control and conclusions. On comparison with the EBM questions developed by Sackett et al, the questions fall into three main categories: validity of results, importance of these results and whether these valid and important results would be applicable to patients.\textsuperscript{6} The questions in the first category are questions specific to the study
design which are necessary to check the overall theoretical framework of a good experimental control; and about the extent of the result; those in the second category relate to decision-making or problem solving aspect of EBP used in clinical set-up.  

In the absence of the Central Council for Physiotherapy regulations for conduct of courses in each University is provided by UGC. The UGC`s mandate includes:

- Coordinating and promoting education in each university.
- Formulation, maintenance and regulation of teaching, examination and research standards in every university.
- Defining and determining the minimum standards of education for each program.
- To keep a track of all the developments in the field of college and university education; giving grants to the colleges and universities.
- Being an important link between the Central and State governments and establishments of higher education.
- Guiding the government; Central and State on the strategies necessary for improving university education.

Though these guidelines exist, there is no professional body in Physiotherapy to ensure its compliance.

There was an absolute need to find out why the skills required for EBP were not methodically placed in most of the UG programs & to investigate the educational needs of Physiotherapy faculties in teaching and training of EBP. Thus, our study highlighted the urgent need of universities in incorporating EBP in their existing entry level curricula.
So, in the phase 2 semi structured interviews were conducted with senior teachers involved in curriculum planning using grounded theory.

Our results showed that, there is a positive attitude towards EBP and majority felt the need of systematic integration in the curricula. It was agreed by majority that EBP is the need of the hour and was required to facilitate professional growth and inculcate lifelong learning. It was reported that around 20-25% students register for PG and rest enter clinical practice with only entry level education. So incorporating and teaching EBP early is deemed necessary to develop the right attitudes and beliefs regarding the same. 27, 28

On asking, ‘What according to you are the reasons that EBP should be part of entry-level education?’ There were responses to this like “EBP is the need of the hour”.

“It will help build a scientific temperament and hence build our own evidence”; “It will help students understand how to link evidence to practice”. This showed that the participants were aware of the current trends and see EBP inclusion as a positive change. Although previous research has shown that physiotherapists have a positive attitude towards EBP, converting these attitudes into changed practice has been difficult. Many processes like the IOWA model of EBP, Knowledge to Action framework help in understanding the process of research use in healthcare. Deriving specific objectives from such models would definitely guide us to construct our context.

The facilitators of EBP were highlighted by improved infrastructure and remarks like, “The profession is evolving to a much higher level compared to what it was 10 years ago”. And research has played a huge role in this. Inclusion of research in UG curricula is seen as a step towards progress. The subject research methodology is
included in entry level programs which introduce the basic knowledge and skills. Fundamental knowledge of research is essential for practice of EBP.

The other facilitator being the fact that our students have daily clinical posting/placement as compared to educational settings where one or two placements are given per year. Daily clinical posting ensures exposure to abundant clinical cases and hence an opportunity to ask practice based questions. The role of clinical in-charges (CI) is highlighted, they need to be role models, encourage critical enquiry and guide them in the process of decision making. CI can help in taking the students over and above the expert-opinion model to research-evidence model.

The greatest barrier is the attitude, towards research and EBP. Since EBP is all about reading research, critically evaluating and then deciding about using it. Arranging journal clubs, having dedicated library days could definitely help in changing attitudes. Values and beliefs which determine attitudes are formed very early during training. Hence teaching students to read articles published in scientific journals; in entry level courses could help in understanding the basics of EBP.

Another barrier was the entry criteria of students to physiotherapy course. Majority of the participants were of the opinion that we need strict entry criteria which are uniform throughout the country to iron out problems like competency, language proficiency, understanding of subject matter, etc. Such students as reported by participants were unable to cope with the rigor of the program.

As mentioned by the participants that majority of the faculty would need training in delivering EBP. It would help to raise the level of education in our set-up. Training faculty will be an important aspect for bringing about this change. Faculty along
with CI will be ‘change ambassadors’ who will help build the scientific environment, promote critical inquiry and direct clinical decision making in a systematic manner. Another important matter would be organizational support for research in terms of infrastructure, computers, well equipped library, and clinical material in all specialty areas.

It was mentioned by the participants that course-work is implemented as written in the curriculum document, so a systematic inclusion of training of EBP would be necessary to give a guideline for teaching. Vertical integration across the curriculum would help inculcate one step at a time with enough scope for practice.

Thus, this qualitative study confirmed the positive attitude of Physiotherapy faculty involved in curriculum planning towards training of EBP. Previous studies have shown changes in learner behavior in professional programs that were based on well conducted needs assessments.115

In study III of our research we developed a module on EBP using a two round modified Delphi process. The Delphi technique has been used widely in health research within the fields of technology assessment, education and training, priorities and information and in developing clinical practice.116 It combines the knowledge and abilities of a group of panelists in a fast, inexpensive and relatively efficient method.

The module was developed from the themes and codes gathered from study II which was a qualitative study with in-depth interviews. There was consensus achieved for content of topics in the 1st round of Delphi, which shows that the themes generated from the senior teachers were agreed upon by the Delphi panel.
The consensus derived module can be used for teaching undergraduate students of Physiotherapy.

The methods for gathering data included interviews and questionnaires so that the individuals with experience and expertise in developing competency-based models could share their insights and knowledge. We used the concepts and themes evolved from study two, to form the basis of our round one of Delphi process.

The key features of a Delphi include iteration, disclosure of identity, feedback and consensus. The anonymous design of the Delphi encourages independent thoughts and opinions to form and prevents any complications because of various social, political, or psychological difficulties that prevent good communication in groups. Only the researcher is not blinded to the process as he/she must ensure all members of the panel have been surveyed. The Delphi technique is an iterative process whereby responses are analyzed and presented back to the participants in the form of a questionnaire until consensus is achieved.

We conducted two rounds of the Delphi process with good response rate from our experts. Even in the case where no consensus was reached the technique often helps to clarify the situation and improve understanding of the field of research in question.

Unlike a traditional survey, where the results heavily rely upon statistical power and generalization to the population; rather a Delphi focuses on consensus among experts.

The Delphi study has been successfully used in many different studies in education, healthcare, sociology, technology, government, recreation, tourism and many more.
However, the process has not been used to develop a module in EBP in India.

The newly developed module gave a detailed content with the mode and duration of teaching. It also highlighted the way it should be integrated with the clinical cases. Practical demonstration should be conducted for enhanced delivery of skills. Students should be given lot of examples of clinical cases and demonstrated the process of finding best research evidence by the clinical in-charges.

In the second round of Delphi, participants arrived to a consensus that this module should be taught to final year students. Suggestions given by the senior faculty in study 2, were to vertically integrate the skills right from 2\textsuperscript{nd} year of UG course. But the opinion of this Delphi panel differed.

For assessing the knowledge domain a pre-test and post-test would help. It will help to know the delivery of context. But to assess the psychomotor and affective domains, attitudes and behaviors during clinical posting, case presentation need to be observed thoroughly by the clinical in-charges. Grading students for these activities would complete the assessment of the entire module.

There was consensus achieved for delivering the entire module in the form of a two-day workshop of 15 hours. Though the Delphi panelists agreed to this, we as researchers and academicians in the research team have our reservations in suggesting the same. Such a hasty delivery would not be able to bring about the right attitude required for EBP. Since it involves complex knowledge and understanding it should be done over a time period to allow students time to learn in between.\textsuperscript{48}
As academicians we have to accept that we can only teach our students the current facts about a subject, the current best evidence. These students of today will be practitioners and academicians of tomorrow, and hence, we need to equip them with skills of reading and understanding research to keep them updated lifelong. We will have to be responsible, committed and determined for their professional developmental.

7.1 Limitations of the study:
The overall, information gained in this study was representative of the universities and 47.7% (43) of physiotherapy curricula were studied out of the total 90 available on UGC website.

The main limitation was that the desk review of curricula was conducted to find out what was taught and what was currently available in the curriculum document regarding the training of EBP. It is possible that these things would not match the actual situation. The curricula did not highlight few things in assessment like the details of format of questions like short answer or long answer. Whether the topics in teaching research, statistics & EBP were taught by physiotherapy faculty could not be known from the curricula.

In study two, we tried to achieve a fair contribution from faculty all over India but the experts selected for the semi-structured interview had maximum representation from Maharashtra (50%), as information related to inclusion of a person as expert was readily available for these members and many experts selected from outside the State did not respond to the invitation sent. Considering constraints of timeframe data collection was conducted.

In study three, we did not assess the reliability and validity of the newly formed EBP module with any other existing module.
7.2 Future scope:

- It is evident that academicians all over India would want to incorporate this important aspect of training of EBP in their curricula. There lies immense responsibility on them to make the upcoming professionals aware of this important concept of life-long learning.

- Faculty training needs to be a ritual for they would be the ones actually delivering and guiding students during training, and hence their attitudes towards EBP matter the most.

- Policymakers, academicians and practitioners would have to come together to collaborate on developing our evidence. It would be a very healthy to have a team working on research up-gradation by sharing their opinions and working towards formulating research protocols to match the needs of our community and country.

- To reduce the gaps between research and practice, all our students should be inculcated with the skills of EBP.

- They should be able to read and search for the best available evidence. During practice that should be able to know ‘how’ to use the found evidence by checking the applicability on our patients.

- They should be made aware and competent enough to create their own evidence through their practice, systematic documentation and through application of research methods. Thus inculcating life-long learning which is the need of the hour.

- Physiotherapy educational universities and institutions have a commitment to ensure that entry level professionals enter into practice with the highest
quality of education, necessary core skills, as well as the skills required to continually update their knowledge and skills.

7.3 **Recommendations to curriculum planning committees:**

1. EBP training should be incorporated in entry level curricula
2. It should be integrated with clinical training
3. Teachers and clinical in-charges should be first trained in EBP
4. Teaching and training the skills of EBP requires a multi-layer approach wherein; instructive sessions should be followed by practical demonstration, to allow time to understand various processes in detail
5. Mode of teaching, duration of teaching and integration with clinical teaching should be emphasized during planning of curricula
6. Organizations should create an environment for the training of EBP as support would be needed in terms of computers, library with scientific journals, reference books, and dedicated reading hours.