

PERCEPTION OF RECENT PHYSIOTHERAPY GRADUATES REGARDING ELECTROTHERAPY IN UNDERGRADUATE CURRICULUM CONTENT

Shivani Chowdhury Salian *¹, Jyoti Singh ².

¹ Professor and HOD, Department of Electrotherapy and Electrodiagnosis, School of Physiotherapy, D.Y.Patil University, Nerul, Navi Mumbai, India.

² Physiotherapy Intern, School of Physiotherapy, D.Y.Patil University, Nerul, Navi Mumbai, India.

ABSTRACT

Background: Electrotherapy like other area of physiotherapy is a rapidly advancing field. To keep abreast of changes, curricula need regular evaluation and updating. The curriculum consists of many components that may vary from content to time tabling.

Methodology: The aim of the present study was to determine the perception of the graduate students for electrotherapy curriculum with regards to content, teaching method and clinical learning. This information will contribute to an overall evaluation of the present electrotherapy curriculum. A cross-sectional survey was conducted amongst graduates (BPT) passed out in the year 2013 until 2015. Validated Questionnaire was used to gather the information. The questionnaire was validated in the School of Physiotherapy, D.Y.Patil University, Nerul, Navi Mumbai. Data was collected and tabulated and statistical analysis was done using SPSS and Microsoft Excel software.

Results: Results indicated that 52 % found that more information should be included on the machines like Laser, EMG, NCS and magnetic field. Almost every respondent felt that they would have like more information about electrotherapy and electro diagnosis related alternative technique e.g. Acupuncture TENS, Shock wave diathermy, EMG, NCS and Dry needling etc. 48% disagreed that the third and fourth year curriculum content was adequate for clinical practice. 50% disagreed that the third and fourth year curriculum content was relevant to clinical practice. Most of the respondents felt that Ultrasound, Hot packs, Cryotherapy, SWD, Paraffin Wax bath, TENS, IFT, Direct current, Iontophoresis, EMG, NCS were very important topics being taught in entry level training for beginning level practice. IR, UVR, Static magnets and Micro current were not important topics while biofeedback, laser therapy were somewhat important.

Conclusions: It was evident from the survey that the BPT curriculum of Electrotherapy was relevant to current practice but inadequate in certain specific areas for example hands on practice of newer equipments, clinical practice in EMG, NCS, Laser and Micro current.

KEY WORDS: Undergraduate Curriculum, Electrotherapy, Relevance.

Address for correspondence: Prof. Dr. Shivani Chowdhury Salian (PT), Professor and HOD, Department of Electrotherapy and Electrodiagnosis, School of Physiotherapy, 6th floor, Medical College building, D.Y.Patil University, Nerul- sector 5, Navi Mumbai-400706, India.

Contact no.: +919167015833 **E-Mail:** chowdhury.shivani@gmail.com

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INTRODUCTION

Education revolves around the curriculum. The curriculum is used to transmit messages and

meanings and teach values [1]. Defining the curriculum is difficult since people reflect their own perspectives in their definitions. The

curriculum has been described as the content of a subject, or area of study, or the total programme of an educational institution. However, a curriculum is not just a syllabus. It is influenced by the way the lecturer interprets it and by the context in which he/she finds him/herself. Various factors influence it e.g. the teaching environment, the timetable, relationships and the social context [2]. The modern curriculum includes objectives and goals besides the content. In the past, no statements were made about the goals to be achieved in the educational process. Specifying objectives has caused lecturers to think their courses.

The obvious assumption is that all of these theoretical components in the physiotherapy curriculum prepare the graduate for practice. However; other factors e.g. professional accreditation groups and regulatory bodies, clinicians, students and lecturers, also influence the design of this particular curriculum [3]. This helps to make it relevant to the present standards of practice and a country's health care needs. The curriculum should be of an acceptable standard i.e. that set by the professional regulatory bodies in the country. However the diversity in the types of private colleges and government colleges and the discrepancy in the regulatory bodies of Physiotherapists we do not have a uniform syllabus or curriculum. Electrotherapy is one component of physiotherapy treatment techniques. Electrophysical agents have a well-established role within physiotherapy practice; the current concepts that influence its application vary considerably from those prepared historically. The use of EPA has a historically important role in physiotherapy practice [4].

Electrotherapy is taught to Physiotherapy students with more basics covered in the undergraduate and advances in post graduate courses. The subjects have evolved over time in accordance with advancements in the field. It is important that curriculum content in this area is evaluated and updated regularly. It well may be that course content that may help to determine the clinical competency of a graduate [5].

Research by Dennis (1987) [6] suggests that up to 61 percent of patient's clinical time is devoted

to electrotherapy time treatment. Electrophysical agents (EPAs) have been incorporated in treatment program for decades. During the mid-1980s, Ultrasound (US) and Short wave diathermy (SWD) were the most frequently used EPA [6]. Three years later, Ultrasound (US), Interferential current (IFT), TENS were reported most commonly used EPA in Australia, with lower rates of usage and ownership reported for more traditional ones such as infra- red radiation (IR), ultraviolet (UV) and wax baths [7]. By the late 1990s, US, Hot packs, TENS, IFT remained in frequent use but SWD while available was used by few faculties [8]. By the early 2000s, IR and SWD appeared almost irrelevant to physiotherapy practice [9].

The practice of Electrotherapy in the present day context is diverse with respect to assessment and treatment skills. The treatment approach may vary from one therapist to another depending on their exposure to various EPA concepts and recent trends [5].

Physiotherapy students in their undergraduate period itself undergo supervised training of clinical services. This supervision is provided by the faculty as well as seniors working in a particular unit. However for a new graduate, supervision and advice from more experienced colleague may not always be available. The new graduate therefore needs to rely on knowledge that was acquired at an undergraduate level. In the light of this new responsibility undergraduate training needs to be of an appropriate standard [5]. One way of assessing the standard of undergraduate education is to evaluate the curriculum content. It is then possible to check whether it is relevant and appropriate and adequately equips the students for the workplace. Students would be the most appropriate due to their current involvement in the course. However, they lack clinical experience. Therefore recent graduates could be an alternative given their recent experience of the undergraduate curriculum and their current clinical role [13].

A micro and macro environment influences goals of the physiotherapy curriculum. The macro environment includes society, the health care environment, the higher education system, and physiotherapy related knowledge. Therefore an

epidemic, for example, may need to be addressed by the physiotherapy curriculum. In this country, we need to address the HIV epidemic. Due to the impact of the disease on the population of the country, our curriculum should be modified so that students are made sensitive and aware of the resulting impact on society and their role in meeting the arising need. The physiotherapy graduate should be sensitive and responsive to this need in society. The micro environment refers to the educational institution and clinical practice settings. This environment also affects learning. Finally goals should always be realistic, feasible and desirable [3]. Content should include essential knowledge for practice and diverse knowledge. "Core content should not be static, absolute or permanent", but should be revised intermittently to reflect global trends in healthcare and in education for Healthcare" [14].

Curriculum evaluation studies involve various classes of information, one being 'supplemental information'. This includes opinions and views of people concerning the curriculum. The stakeholders, who could participate in this type of assessment, may be heads of departments, lecturers, senior clinicians, recent graduates, students and patients. This study incorporated the opinions of the graduate students who were either self-employed or employed with other senior physiotherapists [5]. Supplemental information is very useful in the evaluation process. One is able to determine whether a discrepancy exists between what lecturers perceive to be taking place and what is actually taking place. One may then be able to find out what additional information is needed to see why students are holding these views [10]. More importantly, responses of students with regards to relevance of content can be assessed [11]. This may help to direct change so that the content included is appropriate for clinical practice in Indian communities. It will also contribute to updating the curriculum taught in the physiotherapy department [5].

Therefore we aimed to determine whether physiotherapy graduates consider the EPA undergraduate curriculum content, teaching methods and clinical learning, adequate and relevant to clinical practice. To achieve this we

looked at determining: the adequacy of electrotherapy curriculum content; the relevance of teaching methods and the adequacy of clinical practice.

MATERIALS AND METHODS

A cross-sectional structured interview based survey was conducted over a period of 6 months, amongst a sample group of 150 recent past graduates from 2013 to 2015 so as to be able to collect data most appropriately from the students perspectives rather than the one collected with a bias from the experienced physiotherapists. All the therapists were explained the objectives of the research study using an information letter and a written consent was procured prior to enrolling them in the study. All those who had passed out before 2013 and after 2015 and those who were unwilling to participate were excluded from the study. The methodology was sanctioned by the ethical committee of D.Y.Patil University, Nerul, Navi Mumbai, India.

RESULTS

One hundred and fifty questionnaires were filled. Results of this study are discussed under demographics, curriculum content, the clinical curriculum and general teaching method. Analysis was done using Excel and SPSS version 18 software. 47 therapists passed out in 2013, 42 in 2014 and 61 in 2015. These therapists were either studying further (pursuing their masters program) or were working in private clinics.

Demographics Data: 116 respondents work in Private wards while 112 work in Private OPD. While 2 respondents' works in Government OPD and 1 in Government ward.

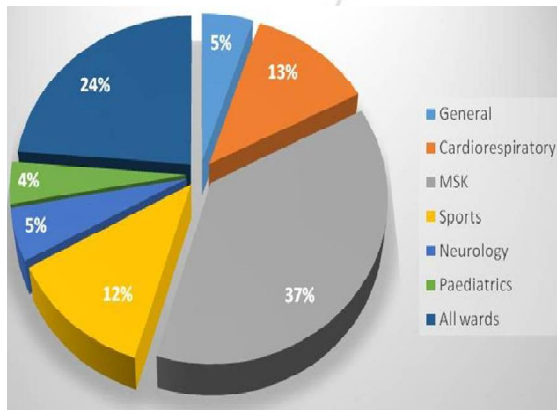
Majority of respondents (37%) worked in MSK area, 24% of respondents worked in all wards while 13% work in cardio respiratory department.

Most of the respondents (91) are primarily involved in clinical practice while 58 are not working in any of the field. Most of the respondents have less than 1 year of experience in physiotherapy (Recent Graduate) while 26% had 1 year of clinical experience.

Majority of the therapists were involved in Musculoskeletal Physiotherapy services. The

distribution of therapists in various sectors of physiotherapy is illustrated in Figure 1. Most of them had an experience of less than 1 year thus denoting recent graduates.

Fig. 1: Percentage of therapists working in various field of Physiotherapy.



93% therapists believed that Electrotherapy should primarily be administered by Physiotherapists alone. Although 7% therapists did believe that other professionals can administer Electrotherapy. 90% therapists felt that Electrotherapy should be introduced in the 1st year of Bachelors of physiotherapy (BPT) programme. 10% therapists thought that it would be better perceived in the 2nd year of Physiotherapy. 38% agreed that the 3rd and 4th year BPT curriculum is relevant with respect to electrotherapy content. 50% therapists disagreed to the same while 12% therapists remained neutral to this question.

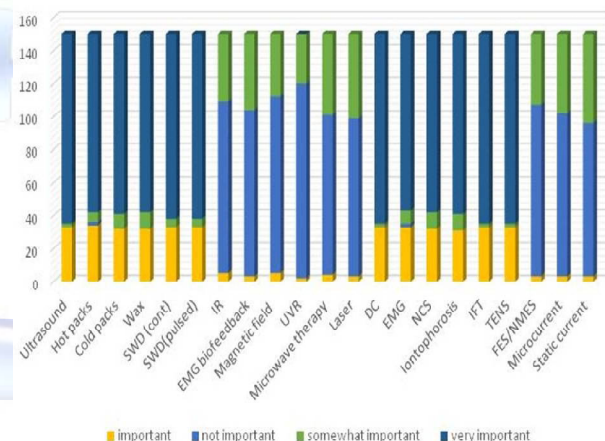
Most of the respondents (90%) felt that Electrotherapy should be introduced in 1st year BPT. 10% respondents felt that Electrotherapy should be introduced into the 2nd year of undergraduate study. 50% respondents disagreed that the third and fourth year curriculum content was relevant to clinical practice.

Therapists wished their desire to include Electrodiagnosis, calibrations of Electrophysical agents and use of newer equipments in clinics in the 4th year curriculum of BPT. Here, 93% felt that assessment and treatment technique could also be included in fourth year and 91% of respondents felt that some of the new EPA could have been introduced in fourth year for clinical use.

When asked if they felt that electrotherapy in third and fourth year curriculum content was adequate for clinical practice, 48% disagreed, 31% agreed and 21% remained neutral about the same.

Most of the respondents felt that Ultrasound (US), Hot packs (HP), Cold packs, Short wave diathermy (SWD), Paraffin wax bath (PWB), Transcutaneous Electric Nerve Stimulation (TENS), Interferential Current Therapy (IFT), Direct current, Iontophoresis, Electromyography (EMG), Nerve Conduction Studies (NCS) were very important topics being taught in entry level training for beginning level practice. IR, UVR, Static magnets and Microcurrent were not important topics while bio feedback, laser therapy were somewhat important. The findings are illustrated in Figure 2.

Fig. 2: Importance of each topic being taught in entry for beginning level practice.



EPA Usage: Ultrasound, hot packs, cold packs, Wax, SWD, TENS, IFT and Direct current are mostly available at primary at every workplace and are often used. While, Laser, EMG, NCS, Micro current, Static magnets, IR, UVR are hardly available and used at any workplace.

Most of the respondents (97%) suggested that the EPAs should remain primarily tool administered by physiotherapist. While 7% suggested that sports trainers and occupational therapist can also administered EPA.

Almost all the respondents felt that EPA should remain in entry level physiotherapy curriculum because of basic knowledge about EPA.

Curriculum Content: Most of the respondents (90%) felt that EPA should be introduced in 1st year. 10% respondents felt that EPA should be

introduced into the 2nd year of undergraduate study.

Most of the respondents (93%) felt that assessment and treatment technique could have also be taught in fourth year. 91% of respondents felt that some of the new EPA equipment could have also introduced in fourth year.

Most of the respondents (50%) disagreed that the third and fourth year curriculum content was relevant to clinical practice. 38% respondents agreed while 12% remained neutral. Most of the respondents (48%) disagreed that the third and fourth year curriculum content was adequate for clinical practice. 31% agreed while 21% remained neutral.

62 respondents felt that concepts of SDC, EMG and NCS were taught in third year were sometime relevant to fourth year clinical practice, 47 found it relevant while 34 found it irrelevant to clinical practice.

Most of the respondents felt that Ultrasound, hot packs, cold packs, Wax, SWD, IFT, TENS and Direct current are the equipment's they are very prepared with in their clinical application while with Laser, EMG, NCS, IR, UVR, Biofeedback, Static magnets and Micro current are not prepared.

Most of the respondents felt that Ultrasound, Hot packs, Cold packs, SWD, Wax, TENS, IFT, Direct current, Iontophoresis, EMG, NCS were very important topics being taught in entry level training for beginning level practice. IR, UVR, Static magnets and Micro current were not important topics while biofeedback, laser were somewhat important.

According to 57% of respondents there were important aspects lacking in the curriculum. 43% did not think so because Information on newer equipment's were inadequate and newly introduced modalities were not a part of clinical course hence it were difficult to associate with patients. 52% respondents said that more information should be included into the EPA curriculum while 48% did not feel this way because newer equipment should also be included in curriculum.

55% respondents said that more information should be included into the EPA curriculum while 45% did not feel this way. Respondents

suggested that IR and UVR should be eliminated from the curriculum as they are not relevant in clinical practice.

Forty six respondents indicated that they were often taught holistic treatment approaches. Fifty four indicated that they were seldom taught these while fifty one indicated they were never taught these.

Teaching Methods: 128 respondents found working with fellow students very helpful, 21 found this helpful, and 1 did not find this helpful. 105 respondents (76.67%) found supervision very helpful, 45 found it helpful. 88 respondents found patient presentation very helpful, 60 found it helpful, and 2 did not find it helpful. 121 found working with senior students very helpful, 25 found this helpful, and 4 did not find it helpful while 111 respondents found discussing patients with lecturers very helpful and 37 found this helpful.

113 respondents found interactive learning e.g. tutorials very effective while 10 found it effective sometimes. 146 respondents found practical sessions very effective, 3 sometimes found them effective. 30 respondents found workshops very effective while 73 found them effective sometimes while 52 respondents found lectures very effective. 52 found them effective sometimes, and 45 found them ineffective.

Most of the respondents strongly agree that Electrotherapy is an important tool to the field of Physiotherapy rehabilitation.

DISCUSSION

Recent Graduates: In the present study recent graduates were more appropriate for this study, given their recent experience of the undergraduate curriculum and their current clinical role [10]. Recent graduates are considered as to be able to collect data most appropriately from the student's perspectives rather than the one collected with a bias from the experienced physiotherapists. Therapists qualified to be working in various centers since 2013 until presently (2015) were considered in the study. A total of 150 qualified physiotherapists participated in this survey.

Teaching Methods: The results from this study indicate that active learning methods were

preferred by this sample of graduates. Interactive learning or active learning methods have been found to be more effective than passive methods e.g. lectures [5].

The problem-based approach is a more in-depth approach to learning because students analyse and integrate information, as opposed to the passive absorbing of information. In a study by Lake (2001), additional reading and discussions in class facilitated learning [12].

Students' marks in this class were higher than those in the group that were being lectured to. Active learning may help them to apply the information better.

The respondents found tutorials, practical sessions and workshops to be more effective than lectures. Fifty eight percent found tutorials very effective, sixty eight percent found practical sessions very effective, and fifty eight percent found workshops very effective. Only thirteen percent found lectures a very effective teaching method.

While lectures are useful to initially teach/ give large amounts of basic information tutorials, workshops/seminars and practical sessions that allow discussion and facilitate problem solving are effective in getting students to consolidate their knowledge.

During some practical sessions, discussion with other students and the facilitator help students to clarify facts and resolve problems.

EPA Curriculum Content: The definition of curriculum evaluation is to systematically collect relevant information about the course. The information is interpreted and then used to judge how well a course is meeting its goals. Finally, action is taken to make improvements [10,11].

Most of the respondents (93%) felt that assessment and treatment technique could have also be taught in fourth year.

91% of respondents felt that some of the new EPA equipment could have also introduced in fourth year. Most of the respondents disagreed that the third and fourth year curriculum content was adequate for clinical practice.

Ultrasound, IFT, TENS, and SWD were the most important equipment while IR, UVR were least important equipment.

Clinical Learning: Many of the (88) respondents found patient presentation very helpful. Whereas 111 respondents found discussing patients with lecturers very helpful and 37 found this helpful.

The patient presentations, case presentations and problem-solving practical sessions mentioned earlier are a good means of teaching clinical reasoning skills. However, additional time is needed in the curriculum to include more patient presentations and problem solving practical sessions [5].

Students do get feedback from lecturers and clinical teachers on some of their management of patients which helps to teach clinical reasoning [5].

Documentation by the student is also assessed and it is quite clear to follow their thinking processes when looking at the patient files. One can then correct or improve this [5].

Respondents found patient presentations, discussing patients with lecturers and working with senior students very helpful. Perhaps these will also assist in clinical learning.

As discussed earlier, patient presentations are done on a regular basis. Senior students should be recruited to help to assist wherever possible. This will have to be well structured into the timetable [5].

CONCLUSION

This study is first of its kind to tap into the perspectives of recent graduates regarding their view point for electrotherapy and use of EPAs in clinical practice. Graduates who have passed out recently are fresh in the market of clinical physiotherapy practice and can well recall the various aspects of their course content in electrotherapy in their undergraduate syllabi. With this background most of the graduate physiotherapists found that the course content of electrotherapy included in their undergraduate syllabus was adequate, however it was irrelevant to the application of EPAs in their clinical practice. The respondents felt that the curriculum could be made more relevant if there was more emphasis on clinical reasoning and application of treatment modalities to the clinical situation. Exposure to research in electrotherapy specifically would also make the

practice of EPA relevant in the clinical setting. Supervision in the clinical placements has increased. Supervision involves patient presentations, bedside teaching and discussion of patients' conditions, assessments and treatment plans. This helps to develop the student's clinical reasoning skills.

Active teaching methods were preferred instead of passive learning. Graduates preferred tutorials, practical sessions more as compared to lectures and workshops.

With regards to clinical learning, respondents felt that the development of clinical reasoning skills was needed. Supervision, patient presentations and discussion of cases with senior physiotherapists was found to be very helpful.

Most of the respondents felt that Ultrasound, Hot packs, Cold packs, SWD, Wax, TENS, IFT, Direct current, Iontophoresis were very important topics being taught in entry level training for beginning level practice. IR, UVR were not important topics and many of the respondents felt that it should be eliminated from the curriculum as it is not relevant in clinical practice.

Most of the respondents disagreed that the third and fourth year curriculum content was relevant to clinical practice. The respondents felt that some third year concepts could have incorporated in fourth year clinical practice like EMG and NCS.

Most of the respondents felt that hand on practice on newer equipment's and more clinical based knowledge on newly introduced equipment should also be included in curriculum.

Changes to the curriculum have therefore started and will continue to be made until it includes all the relevant content [2].

RECOMMENDATIONS

The results of this study indicate that the EPA curriculum content in India should be inclusive of more topics which are relevant to practice today. Wherever possible, students should be taught how to apply their knowledge in clinical practice. More clinical exposure on newly introduced equipment's and teaching is also recommended.

A plan for future fourth years would be to include some of the present third year curriculum (hands on practice on new equipment's) into fourth year. The present third year curriculum has only didactic lectures in the topic of EMG and NCS with no practical application. Perhaps the foundation for more clinical based knowledge on EMG, NCS, static magnets, micro current and Laser should be laid down at the end of third year to allow for more application and problem solving in the fourth year pre-clinical block.

The entire EPA curriculum (first year to third year) should be organized in such a way that there is an opportunity for learning other non-pharmacological applications used as adjuncts, for example, to getting the students to practice and develop alternative treatment techniques.

This involves learning and revising in several practical sessions. Sequence is the process of building one experience on another. Therefore, after the various treatment modalities are learnt, one can introduce case scenarios to teach students how to select the correct treatment modality and apply them.

More difficult scenarios where selection of correct modality is not so obvious, and where students have to modify them before they are applied, may follow this.

Future research in this area may be done to compare EPA curricula taught at other physiotherapy institutes in the country. This may give more clues as to which topics are relevant for undergraduate EPA study. A similar study should be carried out after changes are made to the EPA curriculum to see if there has been an overall improvement.

There should be ongoing evaluation of the EPA curriculum so that it is always relevant to the current situation in India, and of a sufficiently acceptable standard comparable to EPA practice around the world.

ABBREVIATIONS

EPAs- Electro physical Agents
CSWD- Continuous Shortwave Diathermy
PSWD- Pulsed Shortwave Diathermy
LWD- Long Wave Diathermy
lum-IR- Infra-red, luminous
Non-lum IR- Infra-red, non-luminous
IT- Infrared Therapy
UVR- Ultraviolet Therapy

LPLT- Low Power Laser Therapy
LLLT- Low Level Laser Therapy
HP- Hydro collator Packs
PWB- Paraffin Wax Bath
ES- Electrical Stimulation
TENS- Transcutaneous Electrical Nerve Stimulation
C-TENS- Conventional Transcutaneous Electrical Nerve Stimulation
AL-TENS- Acupuncture Like Transcutaneous Electrical Nerve Stimulation
SSF- Strong Surge Faradic Currents
DC- Direct Current
EMG- Electromyography
MCT- Micro-Current Therapy
HVPGS- High Voltage Pulsed Galvanic Current
HVPC- High Voltage Pulsed Current
IFCT- Interferential Current Therapy
ECSWT- Extra Corporal Shockwave
US- Ultra Sound
P-US- Pulsed Ultra Sound

Conflicts of interest: None

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