

## Physical Therapy Research in Professional Clinical Practice

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### Abstract

Movement and manual methods have always been the core of physical therapy practice. Since physical therapy is basically practical, this evokes the question of how well the field fits in with the scientific culture of higher education. The knowledge base of physical therapy should be based on science, supported in practice, and further methodically developed. The physical therapy performed within the health care system is shaped both by the professional community and by research findings. The aim of this study was to give a view on science in physical therapy professional practice and present aspects of difficulties to transfer research knowledge into clinical practice. Clinical practical skills and theoretical knowledge are both necessary components of physical therapy treatment. Physical therapists agree on the importance of research. Bringing science closer to clinical practice is required for the development of the physical therapy profession. However, there are barriers to incorporating research evidence into clinical practice, including lack of time and skills in searching for, and evaluating, research literature. This requires that the content of the educational programs is relevant and that sufficient time, understanding, and education are provided in clinical settings. The scientific basis in professional practice could further be strengthened through enhanced scientific skills and more easily accessible presentation of the research results. As yin and yang, research and professional practice should inter-relate to one another in a dynamic system and give rise to each other as an indivisible whole.

**Keywords:** Clinical skills; Medical discipline; Physical therapy; Professional practice; Research

### Introduction

The hallmark of physical therapy, throughout history has been treatment by means of movement. The manual methods have always been the core of professional practice in physical therapy [1,2]. Manual methods have been passed down from one pair of hands to the next. As the physical therapy profession is fundamentally practical, the question is how well this does coincide with the scientific training pursued in higher education and scientific demands in health care systems? Physical therapists are responsible for both the indication and arrangement of treatment. Analysis, assessment, treatment, and evaluation are all part and parcel of the physical therapist's work [3]. The responsibility imposes demands for clear justification and objective arguments for possible interventions. Higher standards for education and research in professional practice are being imposed. Physical therapists are expected to possess the skills necessary to modify the professional practice so that it aligns with new demands. Increased knowledge about the scientific basis of the field and awareness of current research, as well as knowledge about implications of this connection on professional practice is warranted. In the present study a discussion about research in professional physical therapy practice is given.

### The Physical Therapist's Scope of Practice

Physical therapy is concerned with identifying movement potential and maximizing quality of life within the spheres of promotion, prevention, treatment/intervention, habilitation and rehabilitation [3,4]. Physical therapy is often described as a profession based on specific knowledge, university education, and independence. Physical therapy is founded on a view of health that is specific to the profession, and on its mission of promoting health through movement. Movement can be both the means and the goal of treatment and traditional physical therapy has evolved from passive to active treatments. Preventing, reversing, as well as managing lifestyle-related conditions are issues warranting physical therapists attention in the future [5]. The physical therapist is supposed to examine, analyze, and treat physical

impairments and prevent physical and psychological disabilities. In addition, the physical therapist has tasks of an educational and administrative nature, along with teaching and research. Qualified physical therapists are expected to act in accordance with scientific knowledge and proven experience. The profession has been divided into specialties and subject concentrations, but maintaining the core of general physical therapy is still vital [6].

There has been no clear-cut definition of physical therapy until 1999, when the World Confederation for Physical Therapy (WCPT) adopted its policy statement "Description of Physical Therapy," which was revised in 2011 [3]. While this definition facilitates the "scientification" of what is called physical therapy practice, there are further needs to clarify the meaning of the term physical therapy itself. The physical therapy community is striving to be recognized as a profession. There is a belief within the professional community that physical therapists own a shared knowledge base, although the field is difficult to define. Physical therapists agree that movement and the science of movement are central concepts that constitute the core of physical therapy. In order to describe the field of knowledge, we need well-defined terms and concepts. Ethical rules for physical therapists has been issued, as well as descriptions of professional requirements for physical therapists, which are aimed at making the physical therapist aware of the ethical issues associated with professional practice and guaranteeing patients dignified and objective service [2]. Today, a doctor's referral is no longer required for seeking physical therapy in some countries and physical therapists are responsible for both the diagnosis and the planning of treatment. The responsibility

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imposes demands for clear justification and objective arguments for possible interventions.

### Knowledge Borrowed from Other Disciplines

The discipline of physical therapy does not yet have clearly defined boundaries from other fields [2]. The theoretical basis of higher education in physical therapy is taken from various scientific disciplines such as medicine, behavioral science, and the human sciences [7]. This knowledge, however, must be carefully adapted so that it aligns with the scope of physical therapy practice. If the profession is not meticulously described and delimited, there is risk that another professional category may assume physical therapists tasks. If physical therapists' level of knowledge is low, there is risk of competition from closely related disciplines. A low degree of specialization among practitioners' permits closely related groups within the health care system to encroach and take over certain tasks. This can be parried with specific professional expertise, unique competencies and a more distinct "product declaration" for physical therapy. Research within physical therapy as an independent discipline is necessary, and this is predicated on consensus about what physical therapy is. The knowledge base must become the object of studies that enable the description and systematization of the subject [2,7].

Physical therapists should perform research on the subject of physical therapy in order to promote the knowledge development. As the subject of physical therapy is changeable and hard to define, it is difficult to establish strict boundaries for the areas to be researched [8]. In a recently performed literature study of Nordic doctoral dissertations in physical therapy reported that certain areas of physical therapy are more thoroughly researched than others, while no dissertations at all have been written within other areas [9]. More knowledge is needed about how research findings can best be implemented in clinical practice. Research performed in the researcher's own clinic cannot always be implemented directly in the researcher's own practice. A broader perspective is necessary wherein the international research base must be taken into account.

Physical therapy lies in the border zone between the natural and human sciences [10]. It is possible that the biomedical paradigm of the natural sciences is necessary but not sufficient for physical therapy research as a separate discipline. This should be augmented with a human science paradigm by which means the methodology of physical therapy becomes interdisciplinary. There is an advantage to the fact that physical therapy has now been defined [3,11]. There is a cohesive, central concept to start with, a hallmark of what physical therapy is. As practitioners, physical therapists must limit themselves to the field of knowledge for which they have been trained. It is important to differentiate between certain knowledge and opinion. Absent this, physical therapists could end up doing a little bit of everything and risk crossing the line into alternative medicine.

### Physical Therapist Education

The education of physical therapists has historically been taken place in hospitals, taught mainly by doctors affiliated with faculties of medicine [12]. Tasks were initially controlled by doctors, who prescribed appropriate treatment methods. The physical therapy profession has successively changed since then. Physical therapy training has evolved into a higher education program with courses at the undergraduate, graduate, and postgraduate levels. Aimed at shaping a critically thinking, evaluating physical therapist, training in scientific methods often begins in the very first semester and is

expanded and deepened in following semesters, often culminating in an independent essay project in the advanced course in the final year [13,14].

There is widespread consensus among teachers concerning the importance of connections to research, but time and resource constraints can make this difficult to accomplish. There are also high expectations for teacher accessibility and it requires a great deal of time and commitment to keep abreast of the latest research findings, especially within broad fields of knowledge [15]. Ever higher standards are being imposed on teaching. The teacher's subject knowledge, the time devoted to the task, the characteristics of the student group and educational methods are all critical to teaching outcomes [16]. Teaching should preferably emanate from broad and current subject knowledge, scientific foundations, and a scientific approach to the teaching process. Interest, concern, and respect for the students, as well as appropriate feedback and knowledge testing are prerequisites for optimal learning in higher education [17].

The scientific foundations of physical therapy are still weak [10]. The work being performed within the health care system has often been shaped by the professional community and not by research findings. There may be certain disconnect between researchers and practitioners [15,18]. The quantity of information is so vast that it is impossible to pass on complete packages of skills and knowledge. As a result of the evolution of physical therapy based on medicine and the tradition of doctors as teachers, physical therapists' treatment techniques are often based on medical science. Clinical education is a fundamental component of a physical therapist's professional education. "Knowing how" involves the ability to do, but also understanding what you are doing. Physical therapists must therefore be better equipped to answer the questions: "What do we do?", "How do we do it", and "Why?"

The universities are providing higher education in an increasing number of fields and in an increasing number of professional training programs. How students learn is of high concern, according to Ramsden [17]. Deep approaches to learning are encouraged by teaching and assessment methods that foster active and long-term engagement with learning tasks. A variation in learning patterns has been identified in students' experience of learning to be a physical therapist. Intrinsic motivation is important and the assessment methods, govern how the students learn, e.g., by reproducing, understanding, or memorizing [19]. Focus on real learning objectives in evaluations is moreover important [16]. Interest, concern, and respect for the students, as well as appropriate feedback and knowledge testing, are prerequisites for optimal learning in higher education [17]. Continuous professional development, after the entry level education, is moreover important, but there are barriers to physical therapists' education at Master level. Underuse of professionals' potential in the clinical setting, an unrewarding career structure, negative attitudes, and resistance to change by forces at the workplace have been described [20].

### Art or Science?

Physical therapy treatment was from the outset mainly manual and consisted of movements and massage. Most of the knowledge used in various practices has long and deep roots in the past and is a prerequisite for the development of new knowledge [19]. How physical therapy treatments are actually performed is important, but theoretical arguments for how, when, and to whom treatment should be applied are also necessary. There is a risk that scientific knowledge is being regarded as a phenomenon apart, separate from its actual

practical use. The use of scientific evidence is necessary and physical therapists report a positive attitude, even if implementing research in clinical practice is difficult [18,21]. The attitude towards research is gradually changing and physical therapy research and development are more and more regarded an integral part of the clinical work [22, 23].

Practice itself constitutes a central source of knowledge. What theory and practice have in common is that the value lies in the actual activity. The various types of knowledge are necessary to each other. Truth embedded in fact is intertwined with the act that brought it about [8]. Physical therapy emerged through practical experience and knowledge about the human body. This has been passed down from one pair of hands to the next. If only tacit knowledge is used, opportunities to develop the profession may be reduced. It is difficult to identify precisely the paradigm upon which physical therapy is based because the field is constantly evolving [2]. The theoretical base of the profession needs to be expanded and we need to attach more importance to the knowledge translation process into clinical practice [24,25]. In many cases, there is still lack of agreement between theory and practice [18,21].

Through greater awareness of method and treatment evaluation, the physical therapy field can be better clarified, and set the boundaries of the physical therapy field. Art and science are both necessary components of treatment and knowledge development. Multiple dimensions must be considered in physical therapy practice. Intuitive knowing and a sense of the situation are interesting aspects of the encounter between patient and physical therapist; intuitive knowledge of what is right may be difficult to precisely describe in words in a situation where a craft is being taught [26].

In clinical practice, the physical therapist approaches each patient, and each practical problem as a unique case, where experience and knowledge are interwoven into a decision about the approach, and reflection-in-action occurs. Since every patient case is unique, it is impossible to apply standard theories and techniques without further reflection [26]. When solving a problem, a “reflective conversation” can be used in teaching and the teacher may comment on how the student is approaching the problem [16]. Upon reflection, knowledge and understanding are deepened in a spiral-like way. A repertoire of examples, images, understandings, and actions is built up [26]. The consequences of various interventions are used to decide how treatment should be planned and that it is within the disciplinary confines of physical therapy.

A theoretical approach is necessary to improve quality of the work and development of the profession. Theory is needed in order to understand physical therapy treatment methods and understand the context of the work. Theory is also essential in research in order to be able to ask the right research questions. Implementation of new research findings is important and how the science should be looped back to the clinic in purely practical terms is a science in and of itself [25,27,28]. The ability to evaluate the research findings achieved is important with respect to the spread of knowledge. For the researchers, getting feedback on their research findings is important both to motivate and stimulate the development of research ideas [28].

Clinical practical skills and theoretical knowledge are both necessary components of physical therapy treatment. Intuitive knowing and a sense of the situation are interesting aspects of the encounter between the patient and the physical therapist. Intuitive knowledge of what is right may be difficult to precisely describe in words [26]. According to Shaw et al. both qualitative and quantitative

research methods are needed, and mixed methods research is warranted to generate evidence to support best practice [29].

It helps if physical therapists personally believe in the efficacy of the treatment methods used. But at the same time, there should be a scientific basis to what the physical therapist has to offer. Nowadays, documentation and evaluations of what is done and what the practitioner is aiming to achieve are required in order to describe and prove the effects of physical therapy. The emphasis has been shifted in the direction of science. It is important that a gap does not develop between clinical physical therapy and research.

## Moving Research into Practice

Physical therapists are expected to possess the skills necessary to modify their professional practice so that it aligns with new demands. The knowledge base of physical therapy is required to be based on science, supported in practice, and methodically developed. A challenge is to properly translate the research evidence into patient-specific clinical practice [28,30]. Moreover, there may be a certain disconnect between researchers and practitioners. Respect for various types of knowledge and an understanding that each of these forms of knowledge enriches the other are prerequisites to such an enrichment taking place [15, 24]. Many physical therapists agree with the notion that scientific evidence should be utilized to guide practice decisions. Physical therapists are dependent on research results and report that research is helpful in the professional practice [21,31]. However, there are barriers to overcome, such as time limitations, difficulties in accessing journals, and lack of skills in searching for and evaluating research evidence [18,21]. It is widely accepted that the use of scientific evidence in practice is necessary [21,30,32]. Swedish physical therapy students reports that “reading research literature to update knowledge and to apply research findings to improve practice” as being the most important research activity [32]. Stevenson et al. [23] conclude, that changes of attitudes in the clinical environment are a complex issue. Even if physical therapists are reported to be positive towards research, they are reluctant to change their practice [23]. Uncertainty about what the research reports conclude, lack of literature sources, and skepticism about the value of research are mentioned barriers that constraint on uptake of research results in practice [18,30,33]. The clinical applicability of research results is furthermore important to consider. Patient recruitment, appropriate interventions, and optimal outcome measures to determine effectiveness of physical therapy treatments are required [34]. The ability to critically evaluate the research findings is important with regard to the spread of knowledge. For the researchers, receiving feedback on their research findings is important, both in terms of motivating them to research and to stimulate the development of new research ideas. The knowledge innate in practice should be transferred and applied, and should influence the direction of research. Theoretical and methodological points of departure are often the same, but one goal for the future would be to bring about synergy between physical therapy in practice and the scientific research pursued.

## Development of the Physical Therapy Profession

Requirements of standards for quality and documentation in physical therapy practice have increased and this responsibility imposes demands for clear justification and objective arguments for possible interventions, and this includes improved standards for education, research, and general flexibility in professional practice [8].

Theory and practice are not interchangeable, since each is the prerequisite of the other. Assigning greater value to one must not be

at the expense of the other. Theoretical and methodological points of departure are often the same, but one goal for the future would be to bring about synergy between physical therapy in practice and the scientific research pursued [33]. The goal is for theoretical and practical knowledge to mutually enrich each other as yin and yang are actually complementary, not opposing forces, interacting to form a whole greater than either separate part in a dynamic system. Clearly, clinical education is a fundamental component of professional education and should be based on research-based knowledge as far as possible, by the clinical educators, i.e. physical therapists in clinical practice [35]. There are also high expectations for teacher accessibility and it requires a great deal of time and commitment to keep abreast of the latest research findings. There are similarities to be found between different countries, but also differences in education systems [13,36,37]. According to Ramsden [17] it is important that the student is active in the learning process and takes active responsibility for this process [38]. New graduates require a broad range of clinical reasoning skills. A deeper understanding of the decision making process in clinical practice is important in physical therapy education, to better prepare beginning practitioners for decision making in practice [39]. If the profession is not meticulously defined and delimited, there is the risk that another professional category may assume physical therapy competencies. In order to improve the quality of clinical practice, relevant research questions need to be addressed and knowledge increased how to transfer the research results to the clinical context in an optimal way. Continuing education programs for physical therapists to gain skills in research and knowledge translation in clinical practice are important [20,40]. In order to have an impact in clinical practice, partnership and cooperation between higher education and the health care system is crucial. In this context, new forms of employment in health care should be created that will promote further development of physical therapy. The knowledge innate in practice should further be transferred, applied and influence the direction of research. However, many further questions need to be answered. "Is the scientific base of physical therapy sufficient and are there enough research skills in professional practice?", "How can future physical therapists be motivated to pursue continued independent learning and involvement and interest in research?", "How can practicing physical therapists acquire sufficient expertise to drive knowledge development forward, and how can more in-depth training in practical skills at the undergraduate level be achieved?"

In summary, physical therapy practice should be based on a scientific research platform. The attitude towards research has gradually changed, and physical therapy research and development are now regarded an integral part of the clinical work. The use of scientific evidence is necessary in professional practice and physical therapists report a positive attitude, even if implementing research in clinical practice is reported to be difficult, due to high workload and lack of time. Like yin and yang, science and professional practice may inter-relate to one another and give rise to each other. An increased scientific awareness could increase the professional demonstrated ability to critically examine, assess, and use relevant information and discuss new facts, phenomena, and questions which will further promote the development of the profession and physical therapy practice.

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