



Physical Agents and Therapeutic Modalities: Main Concepts Implicated in Physiotherapy Treatment Prescription and Into Advanced Physical Therapy Practice

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Abstract

Background: physical agents and therapeutic modalities; two concepts that there is no agreement on their definitions. This leads to a complex phenomena of cognitive construction about what the Physiotherapist are qualified, and required to do. **Purpose:** to know about the context, conceptualization and updating of both terms. **Methods:** an electronic search was carried out in the most pertinent databases (PEDro, PubMed, ClinicalKey and OTSeeker). The search strategy was performed in three languages (English, Spanish, and Portuguese), based on preferred reporting items for systematic reviews and meta-analyses methodology (PRISMA). The keywords used for the search were “Physical Agents” AND “Physiotherapy”; “Therapeutic Modalities” AND “Physiotherapy”. Subsequently, an advanced filtering was carried out through the Scale for the Assessment of Narrative Review Articles (SANRA). **Results:** on PubMed there was a result of 8665 studies displayed but only 3 were accepted; in PEDro only 53 results were obtained, 1 of them was accepted and 1 was eliminated because it was repeated. In ClinicalKey there were a total of 1012 results but none were accepted, and in OTSeeker no search results were founded. On the other hand, there were 15 bibliographies that was aviability and were accessed, which only 5 of them met the inclusion criteria. **Conclusions:** findings shows a serious issue in terms of conceptualizing what a physiotherapist must do on its

professional practice. It could be assumed that they may be two concepts that do not put forward a certain importance from the academic, scientific and/or clinical practice perspective.

Keywords: Physical agents, therapeutic modalities, physiotherapy treatment prescription, advanced physical therapy practice

Introduction

Description of physiotherapy

Physiotherapy is defined as a service provided by physiotherapists to develop, maintain and restore the maximum movement and functional capacity of the person throughout his life. Such service is provided in circumstances where movement and function are affected by aging, injury, pain, disease, disorder, condition, and/or environmental factors, with the understanding that functional movement is essential to what means to be healthy (World Physiotherapy, 2019b).

It is considered as a health profession whose main purpose is the optimal promotion of the same and of the function, including the generation and application of scientific principles in the process of examination, evaluation, diagnosis and functional prognosis and physiotherapeutic intervention (Colegio Nacional de Fisioterapia y Terapia Física A.C., n.d.).

Therefore, it is established that as a professional profile, physiotherapists must to know and apply multiple and vast requirements in terms of knowledge, clinical-professional competencies, training, skills, aptitudes, skills and attitudes; which lead to clinical judgment and clinical decision-making to design and apply a treatment (Cebrià i Iranzo et al., 2010).

Advanced physical therapy practice (APP) includes a higher level of practice, functions, responsibilities, activities and capabilities; may be associated with a particular occupational title. It requires a combination of advanced and distinctly increased clinical and analytical skills, knowledge, clinical reasoning, attitudes and experience. APP applies advanced level skills and knowledge to influence service improvement and achieve improved patient outcomes and experience, as well as the provision of clinical leadership, which results in the responsibility for the delivery of care to patients/clients commonly with complex needs or problems safely and competently and to manage risk (World Physiotherapy, 2019a).

Physical Therapy intervention/treatment

Physical therapy intervention/treatment is characterized by developing a specific intervention plan, using problem-solving skills and clinical reasoning in relation to the available resources, thus formulating the

intervention objectives with and to the user (Agencia Nacional de Evaluación de la Calidad y Acreditación, 2004).

Intervention/treatment is implemented and modified in order to reach agreed goals and may include several techniques like therapeutic exercise, manual therapy, airway clearance techniques, integumentary repair and protection techniques, electrotherapeutic modalities and physical agents and mechanical modalities (World Physiotherapy, 2019b).

About the protocols or procedures previously mentioned, the therapeutic modalities is defined as the use of the wide variety of tools, techniques, devices, technologies, methodologies and within many others, complementary to physical agents (Capote et al., 2009).

Physical agent and therapeutic modalities

Then, the definition of physical agents (PhAg) is taken to be those that represent the use and application of thermal, mechanical, electromagnetic and light energies for a specific therapeutic effect (Michlovitz et al., 2022). In addition, they can be classified from a thermodynamics perspective applied to the human body, mechanical forces and electromagnetic energies (Cameron, 2018). Otherwise, therapeutic modalities (ThMo) are defined as the use of a device, equipment or application that provides a physical agent to the organism for therapeutic purposes (Draper et al., 2022).

Research methodology in Physical Therapy

Review articles comprehensively cover a specific biomedical topic and justify future research directions which are crucial to the success of master's, doctoral, and postdoctoral courses. Not least, for senior academic staff, pursuing new career goals and mentoring younger colleagues. Communicating messages through reviews is a matter of intellectual enrichment and improvement of research standards (Gasparyan et al., 2011).

High-quality literature reviews involve assembling and integrating a body of studies to: a) draw strong conclusions about big questions, principles, and problems; and b) explain how and why existing studies fit together and what that means for future theory and research. Therefore, the nature and scope of a literature are not always apparent in the absence of a review; conducting a literature review can serve as an extremely useful exploratory exercise; which means that a literature review may be theory driven or new ideas and conceptualizations may emerge from the process of reviewing and integrating existing literature (Tamboosi et al., 2021).

In the field of Physiotherapy, the main prestigious scientific journals recommend that the main manuscripts to be accepted are those that have the methodology of systematic reviews, narratives reviews, and meta-analysis

studies (American Physical Therapy Association -, 2022; Australian Physiotherapy Association, 2022; Chartered Society of Physiotherapy, 2022).

Even the World Physiotherapy (WP), in its calls for submission of manuscripts and to participate in the call for the presentation of its biannual congresses, highly recommend in first place these three types of previously mentioned research methodologies (World Physiotherapy, 2022).

Methods

Type of study

A qualitative and a hybrid descriptive study was made through narrative biomedical review (Aguilera, 2014). An electronic search was carried out in the most pertinent databases according to subject research (PEDro, PubMed, ClinicalKey and OTSeeker).

The hybrid methodology part was the search strategy, based on the three phases of identification, screening, and included studies of the preferred reporting items for systematic reviews and meta-analyses methodology (PRISMA) (Transparent Reporting of Systematic Reviews and Meta-Analyses, n.d.). The search was performed in three languages (English, Spanish, and Portuguese).

The keywords used for the search were “Physical Agents” AND “Physiotherapy”; “Therapeutic Modalities” AND “Physiotherapy”, and also in the respective languages (“agentes físicos”, “modalidades terapéuticas”, “fisioterapia” AND “modalidades terapêuticas”).

Subsequently, an advanced filtering was carried out to select the studies and/or sources that match up to the inclusion, exclusion and elimination criteria; those was achieved through the use of the Scale for the Assessment of Narrative Review Articles (SANRA) (Baethge et al., 2019).

Criteria selection

The Inclusion criteria were articles and/or sources that contain as a concept or definition the terms "physical agents" AND "therapeutic modalities"; studies and/or sources published in the range from August 2012 to August 2022; and studies that contemplate the design of randomized clinical trials (RCT), systematic reviews (Rs) and meta-analyses (Ma).

The exclusion criteria were those studies with a low level of evidence and a recommendation grade equal to or less than "C". An finally, the elimination criteria was applied to those studies that were repeated in more than one database (Arieta-Miranda et al., 2022).

Research ethics

In the research were not contemplated interaction with humans or animals as study subjects. However, is an investigation in which there is an

exchange of ideas based on a bibliographic review where some disagreements in the information could persist.

It is stated that there are all the considerations and recommendations for the conduct, reporting, editing and publication of school work in medical journals in accordance with the established in the International Committee of Medical Journal Editors (ICMJE) (International Committee of Medical Journals Editors, 2022).

Results

As shown in Figure 1, in PubMed there was a result of 8665 studies displayed but only 3 were accepted; in PEDro only 53 results were obtained, 1 of them was accepted and 1 was eliminated because it was repeated. In ClinicalKey there were a total of 1012 results but none were accepted, and in OTSeeker no search results were founded. On the other hand, there were 15 bibliographies that was availability and were accessed, which only 5 of them met the inclusion criteria.

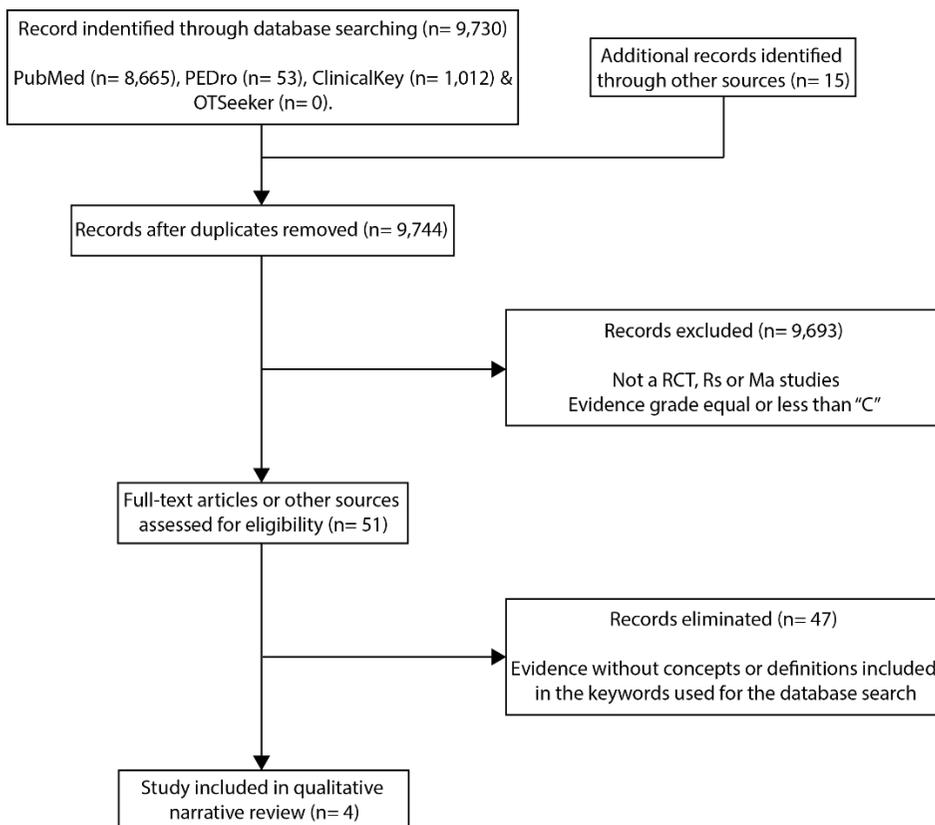


Figure 1. The different phases of the search of the previous eligible four databases, and the selection of the studies included in the study

Discussion

Akyuz & Kenis (2014) refers in their report to a physical therapy modalities as “include pain modulators such as hot and cold packs, ultrasound, short-wave diathermy, low-frequency currents (transcutaneous electrical nerve stimulation [TENS], diadynamic currents, and interferential currents), high-voltage galvanic stimulation, laser, and neurostimulation techniques such as deep brain stimulation and transcranial magnetic stimulation” (p. 254); what is not properly a definition or concept of; it is read more like a list of modalities, techniques, tools, etcetera.

Later in their same report, they talk about rehabilitation techniques and establish that “although one of the major parts of rehabilitation methods is therapeutic exercise, there is no sufficient evidence supporting this idea in the treatment of neuralgia. Many kinds of therapeutic exercises have already been used in the rehabilitation program such as conditioning, strengthening, and stretching exercises” (p. 256).

The foregoing critically reflects that there is no clear conceptualization of each of the terms, including the lack of coincidence and characterization as a health descriptors; worse still, how they classify different modalities in both terms they mention, even separating therapeutic exercise from the rest of the modalities.

Ferrara et al. (2020) conceptualize physical modalities as “natural or instrumental physical therapies that use physical energies (thermal, mechanical, electrical, and electromagnetical) for healing purposes, in inflammatory and degenerative musculoskeletal conditions” (p. 5).

The above is even a combination of both terms (PhAg & ThMo) of the previously cited authors (Cameron, 2018; Draper et al., 2022; Michlovitz et al., 2022), as same as Honda et al. (2018) where they define the physical-agent modalities as “passive treatments such as thermotherapy, cryotherapy, massage, electrotherapy, laser treatment, and others are nonpharmacological interventions” (p. 2).

Finally, in the fourth paper included it was found that Landesa-Piñeiro & Leirós-Rodríguez (2022) handle the term as “Physical Therapy Modalities” but is not even defined o conceptualization of it.

Conclusion

It is important to highlight the lack of information about the present research subject; although it is known that the scientific evidence works more around RCT, case-control studies (CCS), as well as cohort studies (CohS), among others, this does not exempt it relating to importance of explicitly making it very clear what a physical agent is, or consequently, to make a correct statement of what type of therapeutic modality or modalities are used

for such scientific interventions, whenever that a physical agent is not the same as a therapeutic modality and vice versa.

It is worth mentioning that it is certainly noisy that concepts of such magnitude are discussed more in textbooks than in the scientific literature that concerns journals. This phenomenon reflects the fact that it can be assumed or taken for granted that those concepts have already been interpreted correctly, so this situation casts the disturbing suspicion that this may represent serious biases in the core considerations of the methodology used on such trials.

In the present research is believed that the main contribution of this paper can be summarized in the following: 1) physical agents and therapeutic modalities are not the same as concepts, therefore, a conceptual combination between both terms cannot subsist either; 2) both conceptions do not oppose each other, but rather complement between them perfectly well in terms of a clear, accurate and correct prescription in physiotherapy according to the following proposals as an update of both definitions: 3) physical agents are the energy and/or energies that are deposited or applied to the human body for therapeutic purposes, through therapeutic modalities, 4) therapeutic modalities are the technologies, equipment, devices, tools, therapeutic techniques, instruments, methods, or even educational strategies prescribed (including therapeutic exercise) to the patient/client that supply, deposit, or apply physical agents to the human body to induce a physiological reaction which determines an therapeutic effect expected.

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Author contributions

Acordin to the standards of the International Committee of Medical Journal Editors (ICMJE):

G. A. study protocol proposal, design of the study, literature review, data collection, process monitoring, data analysis and interpretation, writing the manuscript, and final approval.

S. J. student research assistant, literature review, scientific presentation, data collection, writing research reports.

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