Taxonomy of performance types in Physiotherapy, from technical procedural knowledge to professional performance.

Taxonomía de tipos de desempeño en Fisioterapia, desde saberes procedimentales técnicos al desempeño profesional.

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Abstract: The paper presents a taxonomy of performance types as a frame of reference for planning and programming teaching plans aimed at developing competencies in Physiotherapy, although it can be applied to other professions. In the literature there are various reference frameworks based on the achievement of competencies that provide a basis for the construction of the taxonomy, in addition, works related to the subject have been consulted . This is a qualitative development work, through documentary analysis and consultation by survey to kinesiologists who work as clinical practice teachers at the University. Based on the literature review, the need to provide a classification of performances based on procedural knowledge considering the degrees of integration and levels of complexity is raised. 5 types of performance were identified: based on technical procedures, strategic procedures, professional tasks, professional activities and being a professional. The article concludes by emphasizing the relevance of the taxonomy for curriculum design, teaching kinesiology practices and training health professionals.

Keywords: Physiotherapy, taxonomy, professional performance, competence.

Resumen: El trabajo presenta una taxonomía de los tipos de desempeño como marco de referencia para la planificación y programación de planes de enseñanza orientados al desarrollo de competencias en Fisioterapia, aunque puede aplicarse a otras profesiones. En la literatura existen diversos marcos de referencia basados en el logro de competencias que dan fundamento a la construcción de la taxonomía, además, se han consultado trabajos relacionados con la temática. Se trata de un trabajo de desarrollo, cualitativo, mediante análisis documental y consulta por encuesta a kinesiólogos que se desempeñan como docentes de prácticas clínicas en la Universidad. A partir de la revisión de la literatura queda planteada la necesidad de aportar una clasificación de los desempeños en base a saberes procedimentales considerando los grados de integración y niveles de complejidad. Se identificaron 5 tipos de desempeño: basados en procedimientos técnicos, procedimientos estratégicos, tareas profesionales, actividades profesionales y el ser profesional. El artículo concluye enfatizando la relevancia de la taxonomía para el diseño curricular, la enseñanza de prácticas kinésicas y la formación de profesionales de la salud.

Palabras clave: Fisioterapia, taxonomía, desempeño profesional, competencia.

1. Introduction

We present a taxonomy based on types of performance as a frame of reference for the planning and programming of teaching plans aimed at the development of competencies in Physiotherapy, which can be applied to other health-related professions. There are various reference frameworks in the literature. based on the achievement of competencies that provide the basis for the construction of the taxonomy, in addition, works related to the subject have been consulted (1-4).

We have considered the teaching model oriented to the achievement of professional competences as an organizing axis. It is known that the conceptualization of competence has an extensive and diverse development (5-6) resulting in a polysemic concept. In this work we define professional competence as: a complex know-how based on knowledge, skills, values and attitudes. The integration process in which the limits of each of the components (knowledge, skills, attitudes and values) are diluted occurs during the development of the competence in the learning stage, in relation to a specific task and within a given context. In the field of Physiotherapy Education, competence frameworks have been developed (7-8) in which the competence domains in which physiotherapists must perform based on this complex know-how are presented and described.

We also took into account works related to the training of physiotherapists, in particular those related to curricular integration in physiotherapy (9). Together, we have taken as a reference the contributions offered by the literature on the categorization of procedural knowledge (1), the parameters for the identification and classification of procedural knowledge (2) and the conceptualization of ten Cate's Professional Activities to be Trusted (3).

According to the reference literature, it is clear that in order to achieve professional competence, it is necessary to develop "complex know-how" and this requires planning and programming where the contents are organized and sequenced, particularly those related to practices in a simulated context or work context. This represents a complex task for teachers, especially for those who work in teaching in the context of work. Having a taxonomy of performances as a frame of reference can be of great help to those who are in the task of planning and programming teaching-learning linked to Physiotherapy, particularly within the context of clinical practice.

In our search, although we have found works related to the development of competencies in Physiotherapy, some focused on teaching and others on evaluation (11-12), we have not found works that categorize the performances in Physiotherapy taking into account the levels of complexity and degrees of integration of knowledge related to the development of the competence. It is from this absence that we ask ourselves the following questions; what types of performances can be identified in the work of a physiotherapist? And how are procedural knowledge integrated during the learning process towards the achievement of competencies? From these questions, the objective is to build a taxonomy of types of performance in the Physiotherapy career.

2. Methods

The study is qualitative, the object of study is a reinterpreted and contextualized reality, and the researchers are part of this interpretation. The main data collection method used is content analysis and consultations with professionals through surveys, in order to then produce their own contextualized frameworks.

The sample of reference frameworks was incidental, those that were available in search engines and internet sites and met the condition of being an official framework approved by a recognized body (Institution, Association, etc.). The consultation was with clinical practice teachers at the National University of Hurlingham.

In the content analysis, recurrences, similarities and perspectives on professional competences and activities are considered. In the case of consultations with teachers, the most frequent professional activities and reasons for consultation were considered, as well as the teaching-learning and evaluation activities that they put into practice.

Ethical aspects: the interviewees were asked for informed consent in which it was communicated that the data will not be disclosed, the information is stored preserving personal data and the results will be communicated once the research is published.

3. Results

3.1 Taxonomy of performance types in Physiotherapy

The taxonomy is composed of 5 types of performance that, at their highest level of complexity and degree of integration of the components of the competence, result in professional performance and imply mastery of the other 4 levels of performance. The characteristics that define each of the types of performance are described below. We organize and graph them in a continuum that goes in increasing levels of complexity and degrees of integration of the components of the competence (Figure 1). This facilitates their organization and sequencing in the teaching-learning process.
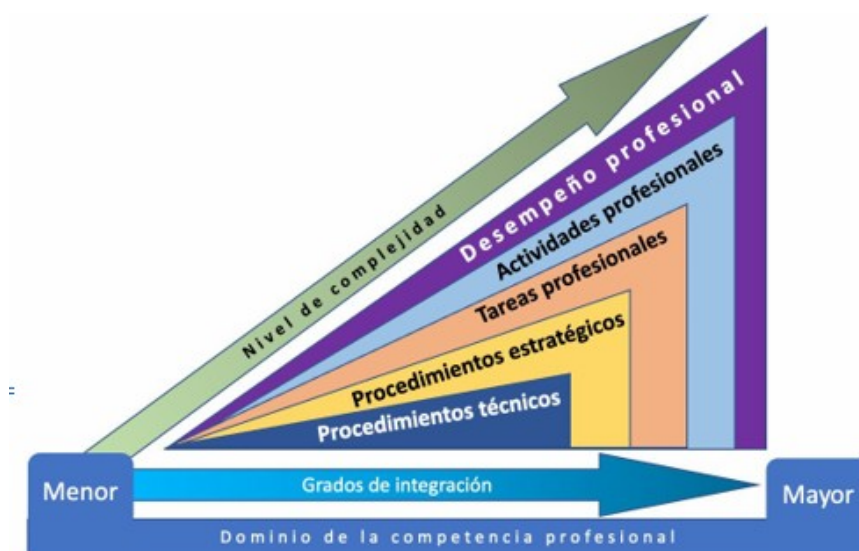

Figure 1. Types of performance.

- *Performance based on technical procedures:* these represent procedural knowledge that involves declarative knowledge of basic sciences and their clinical purpose. They are characterized by low variability in their execution, low cognitive component and little or no decision making for their execution. Due to these characteristics, they have a high level of automation. Some examples of these types of procedures are: delivering a self-administered evaluation form, establishing heart rate by taking the pulse, measuring the range of joint mobility with a goniometer, applying a bandage, performing a muscle strength test, taking osteotendinous reflexes. The learning of these procedures can be initially worked on based on exercises in a simulated context (in vitro) and then, once mastered, in a genuine clinical practice context independently or integrated into strategic procedures and professional tasks.

- *Performance based on strategic procedures* : they represent procedural knowledge that involves declarative knowledge linked to basic and clinical sciences. The characteristic that distinguishes

this type of performance, which may or may not include a series of technical procedures, is the need for adaptation according to the circumstances in which they are carried out. Therefore, they have a high cognitive component linked to decision-making. Due to these characteristics, they cannot be automated. Some examples of this type of procedure are: conducting an interview, performing a biomechanical analysis of gait, performing an ergometric test, designing a group activity aimed at improving and maintaining body mobility levels, agreeing with the patient on an action plan for rehabilitation in a case of chronic respiratory failure. Learning these procedures requires the use of problematic situations to be resolved, which are those that bring into play decision-making and adaptation based on the circumstances. It can be started in a simulated context (in vitro), but its definitive achievement requires a genuine context of clinical practice. When classifying the types of procedures identified in professional practice, the main characteristics mentioned above must be taken into account, which are presented graphically in Figure 2.

- *Performance based on professional tasks:* it is characterized by involving a set of technical and strategic procedures in a work context that are integrated to intervene in some of the stages of professional performance. This level of performance requires the integration of the components of the competence. Knowledge of basic and clinical sciences, psychomotor, cognitive, metacognitive and communication skills, as well as the attitudes and values necessary for professional intervention, whether disciplinary, interdisciplinary or multidisciplinary, lose their limits within a complex act. Some examples of professional tasks are: Perform a comprehensive evaluation of a patient who had a stroke and communicate the result. Apply and supervise a gait re-education plan in a person who had a total hip replacement. Conduct a community consultation to establish needs and agree on an action plan to work on them. Mastery of professional tasks requires the active participation of students in real situations of the profession and the supervision of teachers specialized in clinical teaching. The difficulty of teaching, learning and assessment lies in the integration of the components involved, requiring explicitness and reflective instances. The aim is for students to achieve increasing levels of autonomy in the learning process, which results in greater degrees of responsibility. To this end, it is important that at the time of educational programming, the milestones that students must achieve to move from one level of autonomy to another are defined.
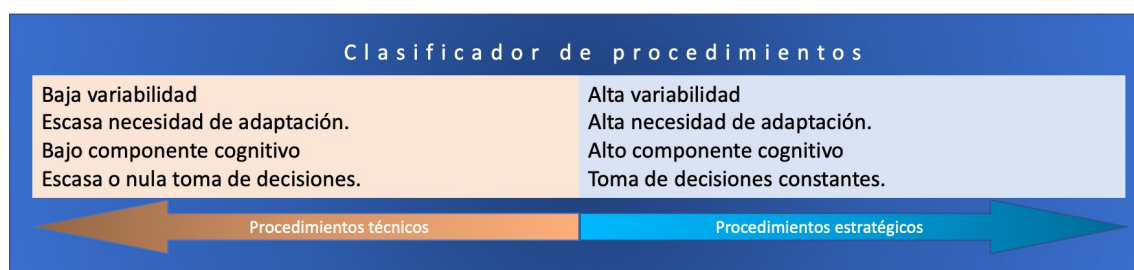

Clasificador de procedimientos

Baja variabilidad	Alta variabilidad
Escasa necesidad de adaptación.	Alta necesidad de adaptación.
Bajo componente cognitivo	Alto componente cognitivo
Escasa o nula toma de decisiones.	Toma de decisiones constantes.

Procedimientos técnicos ← → Procedimientos estratégicos

Figure 2. Procedure Classifier.

- *Performance based on professional activities:* Professional activities are units of professional practice composed of a set of tasks (3). The result of a professional activity is a recognized product of a certain discipline or specialty. By requiring a set of professional tasks, it implies the same level of integration of the components of the competence. Some examples of professional activities are: Intervenes in a community to address factors that individually or collectively affect body movement, cares for a patient with a deficit in body movement due to low-complexity dysfunctions of the locomotor system (9). The professional activities that will be worked on in the training path must be defined at the time of educational planning by those who design the study plan and constitute the guide to establish performances based on tasks and procedures. They can be identified by analyzing what professionals must resolve based on the needs of those who consult within a certain context. As with professional tasks, the goal is for students to

achieve greater autonomy, thereby assuming greater responsibility. For this, it is also necessary, as with the tasks, to previously define in the planning stage the milestones that allow the passage from one level of autonomy to another and supervision by teachers specialized in clinical teaching.

- *Professional performance* : this level of performance implies the achievement of the previous ones, which is developed throughout the entire learning process, but is consolidated and perfected through continuous professional practice, resulting in expert performance. This type of performance cannot be consolidated from the formal learning proposal included in the study plans of undergraduate courses; it requires a process that occurs in the broader, more complex and specific universe of the profession.

3.2. Use of taxonomy in planning and programming the learning of a professional activity.

Considering that professional activities represent within the taxonomy the highest level of complexity in the performance and degrees of development of the professional competence that the student can reach before graduating, it is the first thing that must be defined within the educational programming and planning. Once the professional activities to be entrusted have been defined, the tasks that compose them are defined, then the technical and strategic procedures necessary for each task are identified. It exceeds the purpose of this article to describe how the process to define the professional activities to be entrusted is. Taking as a reference the professional activities to be entrusted "Caring for a patient with a deficit of body movement due to low-complexity dysfunctions of the locomotor system", which is part of a set of professional activities proposed for the Bachelor of Kinesiology and Physical Therapy of the National University of Hurlingham (Argentina), the following teaching-learning sequence is applied:

Students begin by mastering technical procedures, for example: Performing a muscle strength test, assessing joint mobility using goniometry, performing a stability and balance test, submitting a self-administered evaluation form, teaching the use of a cane, among others. These can begin to be developed in the early stages of the career in a simulated environment and then applied in a clinical context. Once the technical procedures have been mastered, or in some cases simultaneously, work begins on learning strategic procedures. To do this, the student is asked to perform one or more of the following procedures: Functional evaluation based on a muscle strength test, joint mobility ranges and stability tests, prepare a status report and communicate it to the patient. Perform a biomechanical analysis of the gait, establishing the aspects to be improved, develop the strategy for rehabilitation agreed upon with the patient. Monitor and make adjustments during movement re-education. Remember that although some strategic procedures can be started in a simulated context (in vitro), they will finish consolidating in a clinical context. As students gain autonomy by meeting the milestones defined during the programming on technical and strategic procedures, they begin to be assigned tasks that involve said procedures, which may include: Performing a comprehensive evaluation of the patient, defining the status of the situation and developing an action plan agreed upon with the patient. Implementing a rehabilitation plan with re-evaluation periods and implementing changes according to the results obtained.

When the student begins to master professional tasks (in the authentic context of the profession) he/she is ready to move on to perform a professional activity that he/she can trust. This means that he/she has integrated the technical and strategic procedural knowledge, has practiced it in professional tasks in context and must now perform all the professional activity with increasingly lower levels of supervision and greater degrees of autonomy. At this stage, the student is asked to take care of "caring for a patient with impaired body movement due to locomotor system dysfunctions" having to define what, how and when to do to achieve the desired clinical objective. Finally, when the student has managed to take care of himself/herself with the lowest level of supervision possible (on demand or reactive), he/she has achieved the highest degree of

autonomy for this professional activity. In the process, he/she has managed to increase, because the passage from one stage to another requires it, the levels of complexity in performance and the degrees of integration of the components of the competence.

4. Discussion

Based on the question raised in this research, how are procedural knowledge integrated during the learning process towards the achievement of competencies? and the collection of information analyzed in competency frameworks, and other regulations linked to curricular development and the responses of teachers about their teaching practices, we consider it essential that each institution can identify competencies and professional activities, to give coherence in training to the integration of knowledge, especially procedural knowledge. We have found different views regarding the level of detail in professional activities, the conceptualization of competence and the ways of approaching the development of these.

Clinical teachers usually have clear ideas about the activities they carry out as professionals; however, we do not find clarity about how they organize this complex knowledge aimed at achieving competencies. This is why the taxonomy seeks to propose a framework to organize this integration.

The complexity of specifying the components of competence in a clear and objective model in the training of professionals, especially in health, causes the expected results to be diluted in the teaching, learning and evaluation processes, resulting in professionals who do not master essential knowledge at the time of graduation or with the impossibility of measuring this knowledge. From the literature and with the proposal of professional activities to be entrusted, it is sought that training institutions begin to give greater clarity and coherence to professional training. The challenge remains of how to organize knowledge throughout the career.

5. Conclusions

- The existence of reference frameworks, both in curricular design and in relation to teaching and assessment strategies, is very useful when planning educational practice. Providing a specific framework for integrating professional knowledge, considering procedural knowledge and professional activities in the Physiotherapy career, aims to offer coherence and support to these planning decisions.

- The framework presented in this work recovers bibliographical sources from various perspectives, such as didactics in general, educational psychology, and literature on the training of health professionals. What has been built then allows us to recover the complexity required for the training of professionals in Physiotherapy, considering the importance of guided practice, supervision, situated learning and the development of professional skills.

- The taxonomy aims to fill the gap identified in the literature regarding professional performance in kinesiology and the levels of integration of professional knowledge, integrating current trends in relation to the subject matter and the particularities of the profession.

- We believe that this framework may be useful for those who are designing a new plan or a curricular modification, for those who work as teachers of kinesic practices, and for teachers who work in basic cycles or foundation training to consider the necessary declarative knowledge that supports both procedural knowledge and professional activities.

Declaration of conflict of interest : The authors declare that they have no conflict of interest.

Authors' contributions : MEK developed the questionnaire and consulted clinical practice teachers. MEK and MLM conducted internet searches for competency frameworks and searched for and selected useful literature for this work, performed documentary analysis to obtain data based on recurrences and similarities, developed tables for data analysis and comparison, constructed the taxonomy, wrote the manuscript, managed citations, and participated in the entire review process, giving the final format to the document in accordance with the journal's standards. The authors developed the content of Figure 1, the final design of which was carried out by MEK, who also developed Figure 2.

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