

# Quality of Care Indicators for Hospital Physical Therapy Units: A Systematic Review

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## Abstract

**Objective.** The purpose of this review was to identify quality indicators described in the literature that may be used as quality measures in hospital physical therapy units.

**Methods.** The following sources were searched for quality indicators or articles: Web of Science, MEDLINE, IBECS, Latin American and Caribbean Health Sciences Literature, Cumulative Index of Nursing and Allied Health, Academic Search Complete, SportDiscus, SciELO, PsychINFO, Consejo Superior de Investigaciones Científicas, and Scopus databases; the Agency for Healthcare Research and Quality, National Health System Indicator Portal, Joint Commission on Accreditation of Healthcare Organizations, and Organisation for Economic Co-operation and Development websites; and the National Quality Forum's measures inventory tool. Search terms included "quality indicator," "quality measure," "physiotherapy," and "physical therapy." Inclusion criteria were articles written in English, Spanish, French, or Portuguese aimed at measuring the quality of care in hospital physical therapy units. Evidence-based indicators with an explicit formula were extracted by 2 independent reviewers and then classified using the structure-process-outcome model, quality domain, and categories defined by a consensus method.

**Results.** Of the 176 articles identified, only 19 met the criteria. From these articles and from the indicator repository searches, 178 clinical care indicators were included in the qualitative synthesis and presented in this paper. Process and outcome measures were prevalent, and 5 out of the 6 quality domains were represented. No efficiency measures were identified. Moreover, structure indicators, equity and accessibility indicators, and indicators in the cardiovascular and circulatory, mental health, pediatrics, and intensive care categories were underrepresented.

**Conclusions.** A broad selection of quality indicators was identified from international resources, which can be used to measure the quality of physical therapy care in hospital units.

**Impact.** This review identified 178 quality of care indicators that can be used in clinical practice monitoring and quality improvement of hospital physical therapy units. The results highlight a lack of accessibility, equity, and efficiency measures for physical therapy units.

**Keywords:** Health Care, Hospital, Hospital Administration, Physical Therapy Department, Practice Management, Quality Assurance

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## Introduction

Quality of care concepts have long been promoted by the seminal works of Avedis Donabedian and other experts in the field,<sup>1–3</sup> but they have not permeated every discipline or every country at the same pace. Quality of care is “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”<sup>4</sup> This definition is further operationalized through 6 domains (accessibility, effectiveness, efficiency, equity, patient-centered care, and safety) proposed by the National Academy of Medicine<sup>4</sup> and the World Health Organization.<sup>5</sup> Besides, Donabedian’s structure-process-outcome model constitutes a must when measuring and improving quality.<sup>6</sup> Both definition and model apply to all health care services and disciplines.

In this regard, some attempts have been proposed for providing a specific conceptual framework to the physical therapy discipline using the Donabedian model,<sup>7</sup> though no consensus has been reached.<sup>8</sup> In fact, instead of conceiving health care quality in physical therapy as an individual, separate conceptual framework, a proper understanding of the concept, and an operationalization of its dimensions in measurable aspects are needed. This will certainly contribute to add value to the physical therapy profession and to the health care system overall.

Physical therapy may benefit from the application of the existing framework to identify tools that measure structures, processes, and outcomes related to physical therapy in areas of urgent need for improvement such as patient education,<sup>9</sup> efficiency in treatments and optimization of time with patients,<sup>10</sup> further implementation of clinical reasoning in daily practice, and referrals to physical therapy.<sup>11,12</sup> From a quality measurement and improvement perspective, these goals require standardized, evidence-based tools that can serve to evaluate, monitor, and guide clinical practice improvement.<sup>13</sup> Such tools include quality indicators that quantify performance in relation to the aforementioned Donabedian elements of care by comparing them with evidence-based criteria for quality or any of its domains.<sup>4,5</sup> Such measurement tools are necessary to guide decision-making and evaluate the success of physical therapy services, but physical therapists may not be aware of the extent to which measures exist. To the best of our knowledge, there is no systematic review on quality indicators for hospital physical therapy units.

The objective of this systematic review was to identify and describe quality indicators for use in hospital physical therapy units. A secondary objective was to present a classification matrix for categorizing quality indicators. Furthermore, as the first of a series about quality indicators for hospital physical therapy units, this paper focused on clinical care indicators for assessing evidence-based practices.

## Methods

This systemic review was performed in accordance with the Preferred Reporting Items of Systematic Reviews and Meta-Analyses guidelines,<sup>14</sup> with 2 substantial modifications. First, we developed inclusion and exclusion criteria for both articles and indicators, the latter being the unit of analysis in our work. Second, we retrieved individual quality indicators from databases and web pages that serve as indicator repositories. The protocol of this review is registered at <https://osf.io/ceybw> (doi: 10.17605/OSF.IO/N569S).

## Data Sources and Searches

A literature search was conducted using Web of Science, PubMed/MEDLINE, IBECs, LILACS, CINAHL, Academic Search Complete, SportDiscus, SciELO, PsycINFO, CSIC bibliographic databases, and Scopus. Additionally, we searched the Agency for Healthcare Research and Quality Indicators database, the United Kingdom’s National Health System Indicator portal, The Joint Commission website, the National Quality Forum’s measure inventory tool, and the Organisation for Economic Co-operation and Development Health Statistics database. Searches were conducted between May and June of 2019.

Search strategies were predefined and created by the 2 principal investigators (D.A.G. and I.M.N.). Due to the a priori lack of quality indicators for physical therapy, we implemented a broad search strategy using the search strings (“quality indicator” OR “quality measure”) AND (“physiotherapy” OR “physical therapy”). Manual searches were used for web pages and repositories without a built-in search engine, and references from the most relevant studies were reviewed for additional papers.

## Study Selection

Eligible articles included those written in English, Spanish, French, or Portuguese measuring the quality of care in hospital physical therapy units (eg, reviews of indicators, indicator development studies, health care evaluation studies, or studies of quality improvement interventions that included quality measures). Studies without explicitly described quality measures were excluded.

We identified potential quality indicators in the selected studies as those based on evidence (at least graded or stated by the authors) and with an explicit calculation formula described (a numerator and denominator or similar). Indicators that were not specific to physical therapy (eg, those aimed at the whole rehabilitation unit or specialties other than physical therapy) were excluded. Indicators that could not be used in the Spanish context due to legal or regulatory aspects of the physical therapy profession in Spain also were excluded. These criteria were similarly applied for the indicator databases and repositories.

After removing duplicates, 2 independent reviewers (D.A.G. and I.M.N.) selected articles by title using the Rayyan QCRI web application.<sup>15</sup> If discrepancies arose, both reviewers discussed the adequacy of articles until they reached an agreement. The full texts (including annexes and additional materials) of the remaining articles were then reviewed.

## Data Extraction

Two reviewers extracted the data (B.S. and A.M.). Discrepancies in data extraction were resolved by consensus. The following data were extracted from each indicator: name, reference, link, denominator, numerator, and level of evidence. We entered all data into an Excel spreadsheet.

## Data Synthesis and Analysis

To synthesize the data, we first developed a classification matrix composed of 3 main taxonomy groups: the 3 elements of care (structure, process, and outcome),<sup>6</sup> also known as the Donabedian model; the 6 health care quality domains (accessibility, effectiveness, efficiency, equity, patient-centered care, and safety) proposed by the National Academy of Medicine and the international community<sup>4,5</sup> (see Tab. 1

**Table 1.** Definitions of the 6 Health Care Quality Domains by the World Health Organization

Health Care Quality Domain	Description
Accessibility	Timely, geographically reasonable, and provided in a setting where skills and resources are appropriate to medical need
Acceptability or patient-centered care	Accounts for preferences and aspirations of individual service users and the cultures of their communities
Effectiveness	Adheres to an evidence base and results in improved health outcomes for individuals and communities, based on need
Efficiency	Maximizes resource use and avoids waste
Equity	Consistent in quality across personal characteristics such as gender, race, ethnicity, geographical location, or socioeconomic status
Safety	Minimizes risks and harm to service users

for definitions); and specific categories of measurement in hospital physical therapy units, as defined through a consensus approach.

Next, a brainstorming session and nominal group technique<sup>16</sup> were employed to identify and refine categories of measurement. Participants included 9 (3 male and 6 female; mean age 45.8 years) heads of physical therapy units at public hospitals who were in charge of 5 to 25 (mean: 13.3) physical therapists. All 9 participated in a working session guided by 2 quality management specialists. In the session, participants conducted 2 rounds of rating, discussion, and rerating. Categories identified in the first round were separated into 2 primary domains: clinical care and unit management. A final consensus was reached by establishing 13 pathology-related clinical care categories that were grouped in 3 applicability settings (ambulatory care, inpatient care, or both), and 10 management categories that could be distributed in 2 accountability perspectives (internal management for indicators related to workflow of the unit itself and external management for indicators related to relationships with other units and shared workflow). Figure 1 depicts the composition of this classification matrix.

All indicators retrieved from searches were catalogued in the matrix. Indicators that could be classified in more than one quality domain were assigned to their primary domain to maintain clear categorizations. Their original titles were adapted and translated into Spanish, French, Italian, and English. Original levels of evidence also were translated into the Oxford Center of Evidence-Based Medicine scale,<sup>17</sup> where Level 1 is the highest level of evidence and Level 5 the lowest. Only clinical indicators are presented in the current publication.

### Role of the Funding Source

The funders played no role in the design, conduct, or reporting of this study.

## Results

### Literature and Indicator Searches

Figure 2 shows the Preferred Reporting Items of Systematic Reviews and Meta-Analyses flow diagram. From the literature databases, we retrieved 465 articles, 176 of which were

screened. After selecting by title and abstract, we reviewed the full text of 102 articles and selected 19 that met our criteria.<sup>18–37</sup> These publications comprised 1 guideline,<sup>19</sup> 4 quality of care evaluations,<sup>18,22,32,37</sup> and 14 indicator development articles,<sup>20,21,23–31,33–36</sup> of which only 3 reported feasibility or reliability measurements.<sup>21,28,34</sup> A total of 200 indicators were obtained, of which 178 were specific clinical care indicators (145 extracted from publications and 33 retrieved from repositories).

### Classification of Quality Indicators for Hospital Physical Therapy Units

Table 2 shows the distribution of indicator type (Donabedian model), clinical care categories, clinical setting applicability, and quality of care domain. Regarding the 3 elements of care, process indicators were the most prevalent ( $n = 136$ ; 76.4%), followed by outcome indicators ( $n = 40$ ; 22.5%), and only 2 structure indicators were present.

They covered a wide range of clinical areas, though some areas were underrepresented, such as cardiovascular ( $n = 2$ ; 1.1%), chronic pain ( $n = 2$ ; 1.1%), mental health ( $n = 1$ ; 0.5%), pediatrics ( $n = 0$ ), and intensive care ( $n = 0$ ). Four clinical areas accounted for 70% of the quality indicators: pulmonology ( $n = 43$ ; 24.2%), musculoskeletal ( $n = 38$ ; 21.4%), geriatrics ( $n = 29$ ; 16.3%), and rheumatology ( $n = 23$ ; 12.9%). Most indicators ( $n = 121$ ; 68%) were applicable to both inpatient care and ambulatory care (Tab. 1).

Effectiveness was the most populated domain of quality of care ( $n = 147$ ; 82.6%). Equity and efficiency were less populated, with 1 (0.6%) and 0 indicators, respectively.

In terms of level of evidence, the median was 3 (interquartile range = 1–5) for process indicators, 5 (interquartile range = 2–5) for outcome indicators, and 3 (one indicator with 1 and another with 5) for structure indicators. Table 3 shows examples of indicators with highest level of evidence (Level 3 to Level 1). The online supplementary material includes all clinical care indicators, along with their characteristics and a short title translated into English (available upon request with their translated titles in Spanish, French, and Italian).

## Discussion

We developed a systematic review of the literature databases and indicator databases to identify quality indicators for measuring and improving the quality of care of hospital physical therapy units. Our search yielded 178 evidence-based clinical care indicators classified into 13 categories, covering all 3 indicator types (structure, process, and outcome) and 5 of the 6 quality domains (accessibility, effectiveness, equity, patient-centered care, and safety). To classify these indicators, we developed a classification matrix composed of 4 taxonomy groups: Donabedian elements of care, quality of care domain, clinical care category, and clinical setting.

### State of the Art of Physical Therapy Quality of Care Measurement

To our knowledge, no systematic review of physical therapy quality indicators has been published. In our results, process indicators were overrepresented, probably because they are easier to measure.<sup>2,38,39</sup> However, these indicators usually cannot be used to infer quality of care unless there is an a priori establishment of a cause-and-effect relationship

<b>Classification Matrix for Hospital Quality Indicators in Physical Therapy</b>	
<b>Clinical Care Indicators</b>	<b>Unit Management Indicators</b>
<b>Donabedian's Elements of Care (3)</b> (Structure, Process, Outcome)	
<b>Health Care Quality Domains (6)</b> (Accessibility, Effectiveness, Efficiency, Equity, Patient-centered care, Safety)	
<b>Clinical care categories (13)</b> Cardiovascular and circulatory system Chronic pain General patient care (all patients) Geriatrics Gynecology, urology, and proctology Intensive Care Mental health Musculoskeletal Neurology Pediatrics Pulmonology Rheumatology Other specialties	<b>Management categories (10)</b> Communication with other professionals Communication with rehabilitation unit Patient case-management Patients without appointment Physical and material resources Transportation Workforce (physical therapists) Workforce (PT/nurse assistants) Workforce (ancillary staff) Workforce (other human resources)
<b>Clinical setting applicability (3)</b> Ambulatory care Ambulatory and inpatient care Inpatient care	<b>Accountability perspective (2)</b> External management Internal management

**Figure 1.** Classification matrix for quality indicators in hospital physical therapy units.

between the process and the outcome of interest,<sup>2</sup> which is mostly warranted for the indicators in our study because we considered only those based on evidence and could be further appraised by the level of evidence of each one. Another reason for the overrepresentation might be the international favoring of process indicators to translate evidence into practice<sup>38,39</sup> and the utilization of recent methods of quality improvement, such as clinical pathways<sup>40</sup> or other process-oriented approaches.<sup>41</sup>

Structure measures were scarce in our results. Only 2 indicators were identified: 1 for a referral admission procedure from pulmonary rehabilitation and 1 for a complete record of complications in stroke patients. This paucity is striking given the importance of these basic structural components. In addition to human and material resource support, structural tools such as these also are crucial, particularly evidence-based decision-making tools (eg, clinical practice guidelines, protocols, and standardized assessments) that help to reduce variability of processes and enhance quality of care.<sup>42</sup> Standardized assessments are instruments that are constructed, administered, scored, and interpreted in a consistent manner to ensure reliability and to quantify and document a patient's baseline status, progress, and outcomes.<sup>43,44</sup> Although the registering activity is a process, standardized assessments may be considered structural elements that should be prioritized in preliminary improvement initiatives.

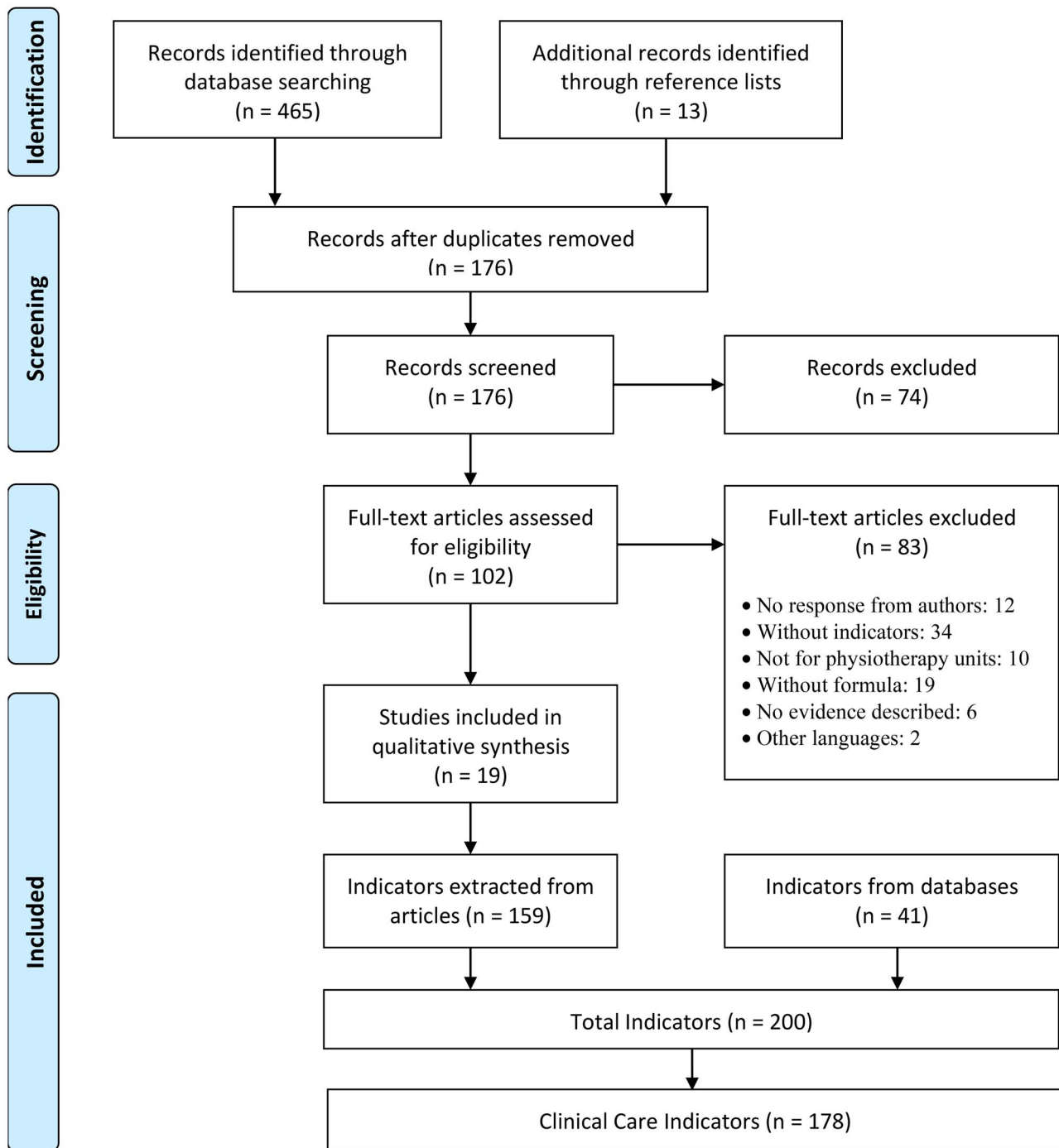
Regarding their clinical purpose, a reasonable number of indicators applied to the main areas of practice in physical therapy (pulmonology, musculoskeletal conditions, geriatrics, and rheumatology), but no indicators were identified in other areas with critical impacts on patient health, such as cardiovascular<sup>45</sup> or intensive care.<sup>46</sup> In addition, some indicators in these areas might have key roles in efficiency strategies (eg, readmission avoidance or length-of-stay

reduction), although readmission and length-of-stay measures should be considered as global efficiency outcomes affected by multidisciplinary workflow. Thus, methodological considerations apply when using these indicators.<sup>38,39</sup>

Indeed, efficiency indicators were totally absent from our results, and accessibility had little representation despite the extent of poor referrals in many contexts.<sup>47</sup> Similarly, equity and patient-centered care seem to be neglected by current research and quality indicator developers, although recent work on patient-centered care in physical therapy could be a good framework for developing indicators in this critical issue.<sup>48,49</sup>

### Scientific Soundness of Current Quality Indicators for Hospital Physical Therapy Units

The current methodological guides for quality indicators<sup>38,50–55</sup> include at least 3 proposals to appraise quality indicators.<sup>52,56,57</sup> Yet, we found few indicators with an exhaustive validation and pilot-testing background. Only 3 articles reported a pilot test and data on reliability or feasibility of their indicators.<sup>20,27,34</sup> None addressed important elements such as the impact of data gathering on routine clinical practice, predefined standards, or risk-adjustment methods.<sup>38,55</sup> These 3 elements relate closely to the contextual circumstances of each health care center, its needs, and its capabilities. So, even with well-developed quality indicators, it is recommended to assess these characteristics and judge the need for adapting them to a new care setting. Specifically, reviewing and adapting international indicators or indicators new to a team who intends to use them is advisable to ensure the measurement tool will be accepted by the professionals involved in quality improvement initiatives. The literature offers several examples of this review and



**Figure 2.** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram of the systematic review of hospital physical therapy quality indicators.

adaptation process,<sup>51,58</sup> which can serve as guides for physical therapists who are less experienced in quality management.

### Implications for Practice (How to Use Quality Indicators)

An extensive collection of quality indicators has been developed for physical therapy. We encourage those in charge of physical therapy units to select 1 or more indicators presented in this study to measure their unit's activity. To make these selections, consensus methods (eg, nominal group technique,

modified-Delphi) could be used.<sup>14</sup> A pilot test is also advisable. The literature cited in this study can be useful for these purposes.

A training in quality assessment and improvement should be included in entry level and continuing education for physical therapists. To this end, and to help support naïve teams in starting quality improvement activities, we recommend contacting a quality manager in the hospital.

### Limitations

We did not conduct a critical appraisal of the indicators, which are thus subject to variability in reliability, feasibility,

**Table 2.** Descriptive Statistics for Clinical Care Indicators

Characteristics	Donabedian Model			Total (n = 178)
	Structure (n = 2)	Process (n = 136)	Outcome (n = 40)	
Clinical care category				
Cardiovascular and circulatory system	0 (0%)	1 (0.7%)	1 (2.5%)	2 (1.1%)
Chronic pain	0 (0%)	2 (1.5%)	0 (0%)	2 (1.1%)
General patient care (all patients)	0 (0%)	0 (0%)	17 (42.5%)	17 (9.6%)
Geriatrics	0 (0%)	22 (16.2%)	1 (2.5%)	23 (12.9%)
Gynecology, urology, proctology	0 (0%)	9 (6.6%)	0 (0%)	9 (5.1%)
Intensive care	–	–	–	0 (0%)
Mental health	0 (0%)	1 (0.7%)	0 (0%)	1 (0.6%)
Musculoskeletal	0 (0%)	30 (22.1%)	8 (20%)	38 (21.4%)
Neurology	1 (50%)	7 (5.2%)	5 (12.5%)	13 (7.3%)
Pediatrics	–	–	–	0 (0%)
Pulmonology	1 (50%)	37 (27.2%)	5 (12.5%)	43 (24.2%)
Rheumatology	0 (0%)	22 (16.2%)	1 (2.5%)	23 (12.9%)
Other specialties	0 (0%)	0 (0%)	1 (2.5%)	1 (0.6%)
Clinical setting applicability				
Ambulatory care	1 (50%)	38 (27.9%)	5 (12.5%)	44 (24.7%)
Ambulatory and inpatient care	1 (50%)	94 (69.1%)	26 (65%)	121 (68%)
Inpatient care	0 (0%)	4 (2.9%)	9 (22.5%)	13 (7.3%)
Health care quality domain				
Accessibility	0 (0%)	1 (0.7%)	1 (2.5%)	2 (1.1%)
Effectiveness	1 (50%)	114 (83.8%)	32 (80%)	147 (82.6%)
Efficiency	–	–	–	0 (0%)
Equity	1 (50%)	0 (0%)	0 (0%)	1 (0.6%)
Patient-centered care	0 (0%)	11 (8.1%)	2 (5%)	13 (7.3%)
Safety	0 (0%)	10 (7.4%)	5 (12.5%)	15 (8.4%)
Level of evidence (Oxford Center of Evidence-Based Medicine)				
Level 1	1 (50%)	44 (32.4%)	2 (5%)	47 (26.4%)
Level 2	0 (0%)	14 (10.3%)	4 (10%)	18 (10.1%)
Level 3	0 (0%)	20 (14.7%)	4 (10%)	24 (13.5%)
Level 4	0 (0%)	8 (5.9%)	4 (10%)	12 (6.7%)
Level 5	1 (50%)	50 (36.8%)	26 (65%)	77 (43.3%)

**Table 3.** Examples of Clinical Care Indicators by Health Care Quality Domain

Domain	Description	Level of Evidence	Type of Indicator	Category
Effectiveness	Percentage of vulnerable elderly with symptomatic knee or hip osteoarthritis for 3 mo and for which a directed or supervised program of muscle strengthening or aerobic exercise has been recommended	1	Process	Geriatrics
	Percentage of women with urge urinary incontinence or overactive bladder who have been advised on behavior modification, including fluid restriction and bladder training	1	Process	Gynecology, urology, and proctology
	Percentage of patients diagnosed with vestibular function problems who have received vestibular rehabilitation	1	Process	Neurology
	Percentage of patients with chronic obstructive pulmonary disease who completed a pulmonary rehabilitation program with at least a minimum number of sessions and whose functional capacity in 6-min walk test improved by at least 25 m	1	Outcome	Pulmonology
Equity	Evidence that a pulmonary rehabilitation program admits patients who have previously had pulmonary rehabilitation	1	Structure	Pulmonology
Patient-centered care	Adjusted rate of change in admission-discharge self-care score in patients >21 y hospitalized with physical therapy treatment	2	Outcome	All patients
Safety	Fall rate with injury per 1000 patient d	3	Outcome	All patients
	Percentage of vulnerable elderly people whose balance or proprioception decrease or who postural deviation increases for whom an adequate exercise program has been offered and need for an assistive device has been evaluated	1	Process	Geriatrics
	Percentage of vulnerable elderly patients who were asked about the occurrence of recent falls	3	Process	Geriatrics

and usefulness. However, we established eligibility criteria to ensure proper, evidence-based indicators with explicit formulas. Furthermore, our classification helps to recognize the purpose of the indicator and provide an initial framework for quality measurement and improvement in hospital physical therapy units. Nonetheless, the classification matrix needs further validation by experts from different countries to generalize its use in different contexts, such as diverse hospital structures and across the various roles of physical therapists.

The physical therapy discipline has access to a broad selection of quality indicators, mainly in the process and outcome domains. These indicators cover most clinical areas (exceptions include cardiovascular and circulatory system, mental health, pediatrics, and intensive care areas). Accessibility, efficiency, and equity indicators are still lacking. More research is necessary to provide proven, evidence-based quality measures to fill the identified gaps and determine how indicators can be implemented in everyday practice. Using currently available measures, physical therapists at hospitals can start evaluating and improving quality of care in their units.

## Author Contributions

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## Systematic Review Registration

The protocol of this review is registered at OSF Registries (<https://osf.io/cybw> – doi: 10.17605/OSF.IO/N569S).

## Disclosures

The authors completed the ICMJE Form for Disclosure of Potential Conflicts of Interest and reported no conflicts of interest.

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