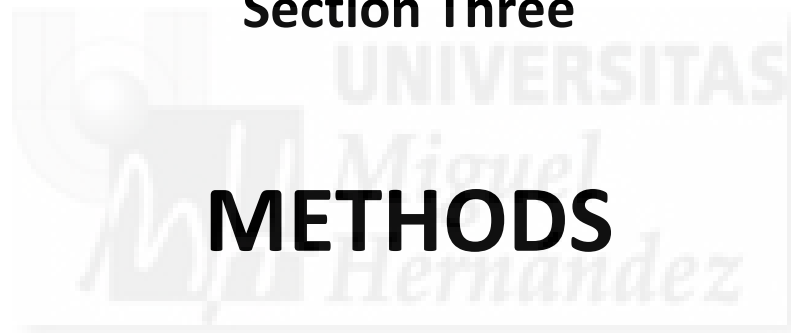


Section Three

METHODS



Section Three

METHODS

A- OVERVIEW OF THE METHODS SECTION

According to our purposes which are exposed in the ‘Introduction & Objectives’, we have developed a set of literature reviews framed as decision-support reviews (as mentioned in the ‘Background’). They began in different moments, yet they partly overlapped over its execution. Briefly, we developed supportive reviews regarding the following subjects:

- Conceptual-framework of PAC Rehabilitation quality (1st review);
- Conceptual pathways linking the health-related outcomes of Post-Acute Rehabilitation with its specific interpersonal dimension, defining the key-elements of latter accordingly to the hypothesized pathways (1st review – part B). This was a review defined and accomplished only in a later stage of this thesis development.
- State-of-the-science/action regarding healthcare quality-initiatives (2nd review);
- Applied state-of-the-action regarding PAC Rehabilitation quality-initiatives (3rd review), which can integrate some content and information abstracted from the previous reviews.

These reviews, altogether, were designed with the aim to support and inform the ability to design of our envisioned recommendations towards the achievement of an optimized ‘system’ of PAC Rehabilitation quality-initiatives, which might be the final product of this thesis. The process towards the design of such recommendation is uncovered at the end of this ‘Methods’ section as well.

Despite specifications for each review (later outlined), there are several commonalities in the review approaches. Despite prevalent among all reviews, commonalities exist mostly for the 1st review (including the 1st review - Part B) and 2nd review. These two reviews

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share the most of the major principles which will be presented together towards outlining both the commonalities and differences in the process when these are more prevalent.

By contrast, the 3rd review process, later independently outlined, had a simpler process and description, since it had a less number of directly applied references and information, as well as it partly represents an integration of information already collected, organized or presented into the previous reviews. Nevertheless, all our supportive reviews were based in some form of integration among of the integrative ⁽¹⁾, realist ⁽²⁾ and scoping review ^(3; 4) approaches, which were outlined in depth in the second part of the 'Background' section.

Indeed, we needed to look after for alternative review approaches other than the 'gold-standard' Cochrane-style systematic review approach which does adequately fit the purposes, subject matter, and underlying sources applied to our literature reviews. The Cochrane-style systematic review approach is, in fact, suitable for assessing 'simple', meaning focused and well-delimited, interventions such as drug trials or strictly defined intervention protocols. However, they fail, or are less suitable to, address wide, complex, integrative, systems-based, and context-sensitive problems such as those embedded into the healthcare quality-movement and its improvement we are about to address. Cochrane-style systematic reviews have, therefore, limited capacity to account for, and explain the, effects of culture, community history, geo- and socio-political variables, program theory, implementation conditions or other context-based variables which characterize complex social interventions applied to healthcare complex adaptive systems ^(5; 6; 7). These latter factors are often the ones that determine whether complex healthcare improvement projects, programs, or systems succeed or not on their ultimate intents. Often these can work well for a set of conditions, and fails into another context. Thus, outlining and further intervening on the conditions or context towards it becomes the most suitable to effective changes and implementation can be a direct matter of interest rather than just a variable to be controlled ^(8; 9).

Furthermore our thesis and review address, in a systems thinking perspective, so wide subject matters with an infinite number, type, or structure of papers and information which cannot be possibly managed or handled by a typical Cochrane-style systematic review approach, strategy, and methods ^(10; 11). These are the reasons we have excluded the Cochrane-style systematic review approach as an option for the development of our reviews.

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At this scenario, we needed to consider alternative review approaches, principles and templates, such as the ones as the mentioned “integrative”, “realist”, and “scoping” review approaches which better match with our purposes and needs. In the ‘Background’ section we provided a full description of each approach in separate. Herein, we can provide an integrative and comparative summary of these approaches, justifying our option for blending these approaches together towards better addressing the integrative, complex, and wide-scope aims and subject matters of the thesis and reviews.

The “integrative” review approach ⁽¹⁾ is based on a system thinking perspective towards reviewing the different parts or subjects that contribute for a phenomenon of interest. However, the content and perspectives shall not remain on different and strictly separated themes, and need to be further integrated into a new, whole, holistic, or systems-based picture, framework, perspective, interpretation, understanding or recommendations for the subject matter addressed. The underlying framing and rationale of this approach match our intents and rationale for the whole thesis and for the supportive reviews. Despite it provides a logical sequence, rationale, and broad structure, however, the approach is too open to many kind of operationalization and somewhat unspecific - at least as described ⁽¹⁾ - in the specific methodology to follow. Furthermore, the purposes of our thesis and reviews are not only integrative, but also more complex and of wider scope than those mentioned to be addressed by the integrative review approach. Therefore, towards addressing the broader and more complex scope our aims - as well as looking for more specific methodological guidance or tips - we have also, and respectively, considered the rationales, templates, and methodological tips of the “scoping” review and of the “realist” review approaches.

Referring to the “scoping” review ^(3; 4), it is an approach designed towards addressing broad or wide subject matters or phenomenon of interest. It might provide a ‘big picture’ summary of what is known, not know, or deserves to be know over a broad topic of interest. It is a type of review opening or raising questions to be answered by further, more focused, reviews, action, or research. Thus, it addresses the wider scope of our review, but it is not so integrative, interpretative, conceptual, and transformative on a way towards building a new understating or possible solutions for the phenomenon as we purpose ourselves to be (as compared to the “integrative” review and the further “realist review”).

Finally, both the “integrative” review or “scoping” review are designed towards achieving a certain degree of generalization of the final product, and they do not optimally frame,

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consider, explore, actively include or outline the idiosyncrasies, complexity, context-specific features, and conditional language or recommendations that are far more well and profoundly addressed by the “realist” review approach ⁽²⁾. Moreover, the support and level of strategic operational details provided by this rationale and template represent useful guidance on the way to proceed about reviewing complex, context-sensitive, interdisciplinary and multi-determined subject matters. However this “realist” review approach, has been designed towards reviewing more specific and well-delimited subject matters such as complex, but still discrete, healthcare programs, projects or implementations with a narrower and less integrative or systems-based scope than our subject matters. Thus, the approach typically follows ‘storylines of research’ divided according to the different theoretical underpinnings which represent different hypothesis, pathways, theories, evidence and contexts under study for a complex, yet specific, program or interventions. In our thesis, our scope is much wider and shall integrate multiple programs, projects, interventions, action, science, theory, or perspectives on a broader systems perspective, framing and potential solutions.

The corollary is that all of the rationales, templates and methodological tips of the mentioned review approaches contribute in some way, and to some degree, towards the accomplishment of our proposed reviews. However, the fact is that none of these approaches could, only by themselves, fully reflect and address our simultaneously broad, integrative, complex, systems-based, and context-sensitive review purposes and subsequent methodological challenges. Thus, we needed to be based on the principles, methodological stages, and tips most suitable to address our needs and purposes, further blended and integrated into a tailored review approach we developed specifically for the accomplishment of this thesis.

Finally, we shall denote that all these reviews, for the matters of analysis and synthesis of information, call for the use of methodological approaches commonly used for the analysis and synthesis of qualitative information. With such regards, we were based on the principles and guidance abstracted from the ‘framework synthesis’ ⁽¹²⁾, detailed into the ‘Background’ section, which is basically an approach combining a deductive scope (the use of an *a priori* framework) providing initial structure and organization, with an inductive approach allowing further and progressive transformational change of information into new, aggregative, content and emergent structures and perspectives.

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The stages, methodological tips we have followed, as well as the review or synthesis approaches they come from, are depicted and detailed into the **Appendix 1**. Herein, we present a summary box with the major methods principles applied to our reviews which does not obviate the consultation of the appendix if further methodological detail is sought for the whole process.

Nevertheless, after the box is presented, we begin to expose, on a stage-by-stage basis, the applied principles and operationally how we have conducted this stage. We will make it in parallel for the 1st review (including the 1st review – Part B) and 2nd review, outlining the major differences and commonalities among these reviews at each stage. As told, the 3rd review was methodologically easier to accomplish and it is outlined briefly and separately afterwards. Finally, we outline the process towards the design of our ‘Integrative Recommendations’ based on the process and results of the supportive reviews.

1. Clarifying, searching, selecting, extracting, displaying analyzing, synthesizing, interpreting, discussing (consulting) and taking conclusions/recommendation for information in a very wide (scoping review), complex (realist review); but nevertheless integrated topics and themes of interest (integrative review).
 - a. The need for wide and different review topics are guided by a system thinking perspective (in ‘Background’) applied to the subject matter.
2. Distinct review topics from search to synthesis are *a priori* defined by organizing frameworks (framework syntheses).
3. “Systems thinking” perspective and acknowledgement of the complexity of the subject matters reflected in the need for information from variety of sources and perspectives (realist review).
 - a. We looked for information of empirical evidence, even quantitative, qualitative or in grey literature.
 - b. But we also looked for political, legal, institutional web-sites, opinion/proposals, white papers and other contextualized information, which are equally important for our review purposes.

4. Highly interactive, iterative, flexible and pluralist review process (integrated, realist and scoping reviews) characterized by:
 - a. Overlapping and continuous back-and-forth on stages progress;
 - b. Review progress goes from exploration to refinement: evolving with author familiarization, immersion and understanding of data;
 - c. Iterative nature among stages accomplishment.

5. Principles guide rules rather than regularize (realist review), thus review methods are tailored according to:
 - a. Review purposes;
 - b. Highly diverse subject matter and literature available for sub-topics;
 - c. *a priori* defined frameworks for displaying, analyzing, organizing and synthesizing data.

6. Data analyses and synthesis are guided by qualitative methods, as fostered by all of the approaches we integrated (integrative, realist and scoping reviews).
As we were based in an *a priori* framework, it represents mostly a deductive approach operational into a “framework syntheses” (framework synthesis).

B- 1ST & 2ND REVIEWS (Including 1st Review – Part B):
Stage-by-Stage Process

As the **Appendix 1** outlines in depth, the process towards the accomplishment of the aforementioned reviews were divided into the following stages:

- 1 - Clarifying Studies Scope & Defining Foundational Frameworks;
- 2- Search Process (by themes);
- 3- Selection Process;
- 4- Extraction & Display (by themes);

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- 5- Analysis and Synthesis (by themes);
- 6- Interpretation/ Conclusions;
- 7- Experts consultation (except the 2nd review).

The methodological process for each stage is below depicted for the 1st & 2nd reviews (including 1st review – Part B), outlining the differences among these reviews for each stage when they are applied.

1 – Clarifying the Studies’ Scope & Defining Foundational Frameworks

This first stage underpins all other review stages. The major definitions made at this stage are propagated and reflected into the definitions and decisions taken at further stages. It might be true for any kind of review approach, but particularly for the review approaches based on the principles of the integrative, realist, and scoping reviews such as these. This first stage is, additionally, where the differences from reviews are the most prevalent. Thus, the description of this stage is clearly the most extensive topic of the ‘Methods’ section.

Synthesis of the stage-applied principles:

- a. The clarity of the review purpose and research questions is able to provide a rationale, focus, and boundaries for the decision-making process in more advanced review stages, such as making an appropriate study selection, or extracting appropriate data (integrative, realist and scoping reviews).
- b. An explicit philosophical and theoretical perspective, or an *a priori* framework, can highlight key issues, concepts, a structure, and themes that guide all the further review process, including the analysis and synthesis (integrative and scoping reviews, and framework synthesis).
- c. It is stimulated a back-and-forth process characterized by highly iterative and

interactive advancements and definitions that are further redefined along with the exploratory searches and a refined understanding of the phenomenon of interest. It can even include the reshape of study's questions (realist review).

1.1 Clarifying Study's Scope & Defining Foundational Frameworks: 1st Review

Our first specific goal is to conceptually frame what PAC Rehabilitation quality specifically means. It might be preliminarily achieved by the development of a literature-based conceptual-framework of PAC Rehabilitation quality. Such a framework needs to be both comprehensive, yet parsimonious, for being representative yet understandable by all stakeholders and actionable through quality-initiatives. It also represents the first conceptual step towards supporting the accomplishment of our major thesis goal.

Beyond supporting the accomplishment of our thesis goal, the conceptual-framework can also have value and applications by its own. Indeed, it could catalyze and support the development of a shared, consensual, stakeholders' understanding of what a PAC Rehabilitation-specific quality specifically means or might contemplate, thereby what PAC Rehabilitation quality-initiatives might be able to improve far beyond the scope and reach of this thesis. Additionally, the construction of such a conceptual-framework could reveal major gaps in knowledge and research that might be impeding the advancement of quality and quality initiatives in this field (e.g., one of the on-going identified gaps led us to develop the 1st review part – B). These secondary application aspects will be in-deeply addressed in the 'Discussion' section of this thesis.

In this first review stage, we explicitly defined a philosophical and theoretical perspective, as well as an *a priori* framework⁽¹²⁾, which provided a structure and rationale for the whole review process and the decision-making on further review stages. Therefore, we have invested great deal of time and effort at this point, given the preponderance it might have in the ability to shape the final review product.

1.1.2 Overarching framework foundations (1st review)

The healthcare widely-recognized Donabedian's quality-model of structure, process and outcomes (SPO) was our seminal and overarching model supporting framework

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construction. The model provided the 3 axis for searching, mapping and charting information later abstracted from the literature ⁽¹³⁾. We further denote that the SPO framework was also the major underlying conceptualization into previous rehabilitation quality-framing papers ^(14; 15).

Operationally, we have sub-divided the process-axis into two different, yet interdependent, dimensions of care (technical and interpersonal) ⁽¹³⁾. This is a major, sometimes underestimated, feature of the SPO-model, as later denoted by the author himself ⁽¹⁶⁾. From Donabedian's work, we also applied the conceptual differentiation among immediate (micro); intermediate (mini) and delayed (macro) outcomes ⁽¹⁷⁾. It outlines a time-sequence and integration of outcomes, including the notion of *continuum of process-outcomes* in which the proximal outcomes continuously interact with the care process to produce the more distal and complex macro outcomes ⁽¹⁶⁾. The Donabedian's outcomes differentiations were also endorsed and applied to rehabilitation by the Eldar's rehabilitation medicine quality-framework towards illustrating the typical step-wised rehabilitation process which is build upon a chain of progressive rehabilitation steps and outcomes ⁽¹⁴⁾.

Importantly, we note these Donabedian's conceptualization of outcomes particularly match with the ICF (International Classification of Functioning) framework ⁽¹⁸⁾, launched two years after the Eldar's framework. The ICF is currently the most widely acknowledged framework of functioning applied to rehabilitation ⁽¹⁹⁾, therefore the ICF stands as a major conceptual foundation for the functionally-related concepts to be included into the outcomes-axis of the framework.

As precursors for the construction of our conceptual-framework development, we additionally applied insights and definitions abstracted from the rehabilitation SPO-applied papers, namely the Hoenig and colleagues' work, mostly applied to stroke rehabilitation health-services research ^(20; 21; 22). We were able to take from these papers some organizing features, mostly as applied to the structure-axis and applied to the technical dimension of the process-axis.

The team-work process - a major PAC Rehabilitation intrinsic characteristic - is also independently framed in the process-axis, holding a pivotal supportive role for other dimensions of PAC Rehabilitation process, supporting outcomes achievement, as mostly framed by Strasser and colleagues' work ^(23; 24; 25; 26; 27).

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We summarize these features in the following box for easier assimilation:

Overarching framework	Donabedian's SPO quality-model providing structure (e.g., categories) and rationale to the review development and presentation.
Other Precursors and Conceptual Foundations	<p>Eldar's framework regarding rehabilitation medicine quality: an application of the SPO model;</p> <p>Hoening and colleagues' stroke-rehabilitation health-services research: an application of the SPO model.</p> <p>Donabedian's outcomes differentiation: immediate, intermediate and macro/delayed outcomes; as well as the notion of the 'continuum of process-outcomes'.</p> <p>International Classification of Functioning (ICF) as the framework and classification of functional-related rehabilitation outcomes</p> <p>Differentiation among the technical and the interpersonal dimension of care, supported by the SPO model.</p> <p>Interdisciplinary teamwork as crucial peer-based supportive process for the dimensions of PAC Rehabilitation care.</p>

We shall further denote that, lately, we added an 'improvement process' category to be approached by the PAC Rehabilitation quality conceptual-framework. The decision and major content was based on the findings and knowledge absorbed by the accomplishment of the further 2nd review (state-of-the-science/action in healthcare quality initiatives). It is one example illustrating the inductive allowance for the emergency of new components and the highly interactive and iterative process for the development of this thesis as a whole unit, despite the value and analysis that could be placed on each review as independent products.

1.2 Clarifying Study's Scope & Defining Foundational Frameworks: 1st Review – Part B

The 1st review – part B review was the last to be planned and executed. Recalling, it was not in the initial set of objectives. The need to engage with this complementary review was raised by the perception, along with the accomplishment of the 1st review, that a quality-element was markedly sub-addressed by specific and organized research and conceptual developments in the PAC Rehabilitation field. We mean the interpersonal dimension of care, its key applied elements, and the mechanisms that could link this dimension with PAC Rehabilitation health-related outcomes. Therefore, we felt the need to conceptually develop these subjects which, once sub-developed, could be a later target to be addressed by our final 'Integrative Recommendations'.

Furthermore, we must denote that the execution of this review was made, in its major part, during a 3-month research-stage coursed outside Spain which was part of the requirements for accomplishing an European Doctorate, as previously mentioned into the 'Objectives'. Therefore, this specific review was oriented, and co-authored, by Isabel Silva, as supported by the contract and final report of the research-stage (**Appendix 2**).

1.2.1 Foundational frameworks (1st Review – Part B)

The major foundational framework for this review was the conceptual-framework we present as the product of the 1st review (see the framework in the 'Results'). Additionally, we were based in the rationale of recent papers doing an equivalent reasoning for general healthcare. We specifically refer to the papers from Street and colleagues⁽²⁸⁾ and De Haes and Bensing⁽²⁹⁾.

In the subject matter of this review, we were influenced by psychological theory and behavior change models. We mean the social cognitive and self-efficacy theory^(30; 31); humanistic and self-determination theory^(32; 33); self-regulation theory⁽³⁴⁾, coping theory⁽³⁵⁾ and the positive psychology perspectives, science, and constructs⁽³⁶⁾. Additionally, we considered the behavioral enhancement/change theory and models such as: the transtheoretical model⁽³⁷⁾, the theory of planned behavior⁽³⁸⁾, the goal-setting theory⁽³⁹⁾, the cognitive dissonance theory⁽⁴⁰⁾, the health action process approach⁽⁴¹⁾, and the applied model of motivational interviewing⁽⁴²⁾.

1.3 Clarifying Study's Scope & Defining Foundational Frameworks: 2nd Review

The specific aim of the 2nd review was to integrate and synthesize the literature on the state-of-the-science/action related with quality and quality-initiatives, as applied the whole health/healthcare system, considering the US as the context of application. It would be made through a wide-scope literature review and integrative synthesis of the major current trends for quality and quality-initiatives, as approached by the roles and perspectives of different groups of stakeholders over a systems-based ecological framework.

1.3.1 Major foundational framework (2nd review)

The long-term goal underpinning this thesis development requires an underlying involvement of PAC Rehabilitation stakeholders. They might be able to develop active partnerships for the optimal advancement of a 'system' of PAC Rehabilitation quality-initiatives. Therefore, we made the organization of our review and synthesis around the roles that each group of stakeholders can have for the enhancement of quality and quality-initiatives in healthcare, yet holding a system-based perspective exposing inter-dependency of stakeholders' actions.

For this review, we took the option to follow the same foundational framework of the review process that supported the development of the recommendations given by the Institute of Medicine's landmark *quality chasm* report, launched about a decade ago^(43; 44). This framework is outlined in depth in the 'Background' section. Herein, we synthetically mention that the framework emphasizes a systems thinking perspective and it is framed on four major ecological levels of influence to the quality of healthcare and its quality-initiatives, as below exposed into a four-part box illustrated with examples of stakeholders for these levels applied to the US context.

A. Patient and family level (consumers or broader populations):

These stakeholders represent the fundamental source of definition for quality. It means that changes on other levels, to be of quality, necessarily need to become reflected in them, as well as they must be responsive to their needs, values and preferences.

B. Micro-system:

It is the smallest system-unit of care, constituted by a set of inter-dependent frontline practitioners that interact with each other and the same set of patients and families for producing a unit of work and outcomes:

- 1) Clinical staff (e.g., physician, nurses; therapists, other healthcare practitioners);
 - 2) Micro-system leadership (e.g., department head, leading physician, leading nurse, intermediate level manager);
 - 3) Administrative and ancillary staff (e.g., receptionist, patient representative, a multitude of ancillary staff).
- Community stakeholders (micro-level): It represents people or entities outside healthcare practice, but whose activity directly interferes with health/healthcare outcomes at the individual level.

C. Macro-system:

It represents the organizations or settings that hold, house, and structurally support quality of care and quality-initiatives at the micro-system or frontline level of practice. These are for instance:

- 1) Healthcare delivery organizations or providers (e.g., hospitals, primary care offices, clinics, home health organizations, or skilled nursing facilities).
 - 2) Integrated Delivering Systems (e.g., multi-providers settings, organizations or networks, health plans – those who are not limited to act as payers);
- Community stakeholders (macro-level): It represents organizations, services and sectors that are not healthcare providers, but whose activity directly interferes with health of populations and healthcare delivered to them.

D. External level:

There is a wide range of external systems and entities that shape/influence the quality of healthcare organizations, stimulating or supporting the quality-improvement action. These are for instance:

- 1) Payers and purchasers (e.g., insurers, public programs such as Medicare and Medicaid, health plans, employers, self purchasers);
 - 2) External/independent quality-bodies (e.g., accreditation agencies for healthcare organizations, entities measuring and reporting quality-information, or quality-improvement organizations)
 - 3) Suppliers (e.g., pharmaceutical industry, suppliers of equipment, material and health information and communication technologies);
 - 4) Research community (e.g., stakeholders doing, supporting, guiding and funding basic and translational research, systems science, interdisciplinary and trans-disciplinary research, health-services and outcomes research, or improvement and implementation research);
 - 5) Educational community (e.g., universities and healthcare schools, entities providing quality training or education, professional accreditation, credentialing and licensing bodies).
- Public Policy stakeholders (federal, state and community level). This last overarching level of the external healthcare environment influences or broadly shapes - through stimulus, regulation, or guidance - the action of all external and other healthcare stakeholders.

For each group of stakeholders, we shall outline the roles, action, perspectives, and evidence on current issues of quality and quality-initiatives that most directly concern to them. Some themes of relevancy for quality (e.g., the implementation of electronic information/communication technologies) require contributions from many of these highlighted groups of stakeholders and are transversal to them. In these cases, for each group of stakeholders, we shall outline the roles, action, perspectives, and evidence that

most directly concern to them regarding the subject, in a dynamic interaction with the other subjects of interest for the same stakeholder's group. It allows the provision of an integrative picture of their current roles and perspectives for quality and quality-initiatives for each specific group of stakeholders without losing the systems perspective.

2- Search Process (by themes)

The search process was made in the aforementioned reviews by themes, shaped by the outlined foundations, and through a highly interactive and iterative review process. For instance, the search stage was highly interactive with the previous stage of clarifying the study's scope and defining its conceptual foundation, but also with following stage of selecting papers and information for review. In other words, the search was based on foundational frameworks (e.g., regarding categories or starting key-words to search). Moreover, the search and a preliminary selection process occurred almost concurrently and in a interactive manner with the selection process, for instance a first evaluation of relevancy of information was made concomitantly with the search process, in turn guiding further searches. This is a contingent way of searching information, feeding a 'snowballing' search process, which was the major search strategy we employed in the sequence of the preliminary and exploratory searches and appraisals of the literature for a subject, theme, or category.

We should additionally note that the search process was not closed to new relevant information further found, even in more advanced stages of the review, including the stages of synthesis or expert feedback for refinement.

Synthesis of the stage-applied principles:

- a. There is a need to look for empirical evidence (quantitative and qualitative), but also for other critical sources of information (political, legal, institutional reports and web-sites, opinion/proposals, white papers) within the subject matter. Therefore, the focus of the search strategy remains in the use of multiple sources of information: databases, reference lists, and related institutional web-

sites (integrative, realist and scoping reviews).

- b. There are an infinite number of potentially informative papers and sources. Therefore, limiting the search process and achieving some kind of a representative sample is unavoidable. However, this tightening cannot compromise the ability to accurately respond to the research question or purposes (scoping review).
- c. There is a need to actively search for ‘purposive samples’ (e.g., categories) in order to retrieve information for specified topics and sub-topics/themes of interest under each review (integrative and realist reviews). Major topics/themes for search are defined accordingly stage framework foundations. However, they can be formed iteratively as the search process evolves towards a progressive depth and breadth, and as the author’s understanding of the topic/theme evolves from exploration through a better formulated notion of the specific subject matter (realist and scoping reviews).
- d. There is a need to use of a wide-open and highly iterative search strategy and key-terms, which include an iterative and exploratory combination of related key-words into relevant scientific-databases. However, the search strategy goes far beyond this databases search. Indeed, an iterative ‘snowballing’ (references of references; citation-tracking; references suggested by experts input) proved to be much more fruitful for this type of review purposes, since applied to an open and ill-defined subject matter (realist review).
- e. With such a search strategy, there is a need to define when to stop-looking for additional information/references in a way that foster feasibility but that simultaneously do not compromise the achievement of review purpose (realist and scoping reviews). Therefore, the definition is to stop-looking for new information, at least actively or purposively, when ‘saturation’ is achieved (realist review), referring to the inability to find more relevant, updated, aggregated, or solid material, for a topic or category, as compared with that we already have achieved.

2.1 Search Process (by themes): 1st review

Below, we present the specific features we have followed for our 1st review, with a searching process organized by ‘purposive samples’, themes, or categories for search.

2.1.1 Organizing the search process: ‘purposive samples’ (1st review)

Within the broad field of the information applied to PAC Rehabilitation quality, we began to organize our search process by themes/categories, according to the foundational frameworks whose structure provided the ‘purposive samples’ for our search process. It means that we actively sought for representative materials on each theme or category for search which were defined according to the foundational frameworks. These themes or categories for search are generally the same themes and categories we will later use to synthesis and presentation of the final review product, despite some inductive development and transformation could occur along with the process (e.g., development of a category for the ‘improvement process’).

2.1.2 Preliminary and exploratory searches on databases (1st review)

We began our preliminary and exploratory searches on relevant scientific databases (PubMed, CINHL, and PsycINFO) on January 2008. According to the this stage applied principles, we began to use a wide-open and highly iterative search strategy combining relevant key-words into related databases. It started up the search process using ‘snowballing’ techniques. This process was never completely closed until the final synthesis of the review, being open to the emergence of new relevant or updated information or support. In the preliminary and exploratory searches for each category on electronic databases we employed key-terms (below outlined) which were related with our foundational frameworks. We used two broader groups of key-words iteratively combined with each other. The following set represents the first group of key-words.

- Outcomes:
 - Outcomes; function; activity; participation; ICF; quality of life; family/relatives burden; satisfaction; experience.
- Process – technical dimension, interpersonal dimension and teamwork process:
 - Process; goal; goal-setting; guidelines; best-practice; protocol; intervention; method; technique; individualization; coordination; teamwork;

multidisciplinary; interdisciplinary; transdisciplinary; provider/practitioner-patient relationship; communication.

- Structure:
 - personnel; skills; competence; organization; management; culture; equipment; material; settings, facilities; infrastructure; communication/information technologies.
- Quality-initiatives and related terms such:
 - Quality; assurance; monitoring; assessment; improvement; efficiency; effectiveness; cost-effectiveness; health-services research; payment; reimbursement; pay-for-performance and episodes of care.

The following second group of key-words relate with PAC Rehabilitation services and care:

- PAC Rehabilitation services (post-acute; rehabilitation; PAC; acute rehabilitation; sub-acute rehabilitation; home health rehabilitation).
- Disability and rehabilitation of major disabling conditions (e.g. disability; impairment; handicap; stroke; spinal cord injury, brain injury, amputation, neurologic rehabilitation; orthopedic rehabilitation).

2.1.3 'Snowballing' as the most effective search strategy (1st review)

From the exploratory searches in electronic databases, we were able to find a preliminary set of representative papers, able to activate or trigger a more comprehensive search through a 'snowballing' process. Illustrative examples of 'triggering' papers were the papers on series of the *Archives of Physical and Medicine Rehabilitation*, published in 2007, which report to a US rehabilitation-experts' conference. The series holds a common title of 'state-of-the-evidence' with the common underlying purpose to inform policy decisions and make policy recommendations on an evidence-basis^(45; 46), including quality and quality-initiatives as a matter for policy analysis and recommendations⁽⁴⁷⁾. Based on references list, key-words abstracted, or citation-tracking, we were able to pursue other critical sources, including more updated ones, for related information until a 'saturation' level could be achieved.

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2.1.4 'Saturation' principle for stop-searching (1st review)

We varied, widely, in the amount of references needed to achieve a point of 'saturation' (the point in which we actively stopped to look for new references) regarding each theme or subject under review. Indeed, for (sub-)themes we could easily find valid representative information about the state-the-science (e.g. recent, widely cited or acknowledged, and/or solid empirical references, or already systematically reviewed – the major selection criteria) we could easily rely on these references and on a 'snowballing' process with origin o these references for that (sub-)theme.

We further look for information not in unique confirmatory directions, but also (or mostly) regarding ambiguous, alternative, or even contradictory information and perspectives for a broader perspective over the subject. In contrast, there are (sub-)themes or topics in which developments were of weaker validity, meaning topics in which few specific and directly applicable information, or of low empirical strength, was available.

A major illustrative example refers to the themes of the process axis. There is a wide difference in the breadth, quality and specificity of information. In the technical dimension of care and more recently also in the teamwork process, there is a good level or growing body of directly and specifically applied empirical information. In contrast, for instance regarding the interpersonal dimension of care, there are few specific articles empirically and conceptually developing the subject. This raised awareness led us to the development of a complementary review (1st review – part B) specifically addressing this subject.

2.2 Search Process (by themes): 1st review – part B

This complementary review generally followed the searching process we were just about to describe, with a major difference. Indeed, we were able to start ahead into the searching journey with less time dedicated on preliminary searches, since we already made it from the 1st and 2nd review processes (we recall such review was the last to be initiated and executed). Therefore, we were able start with a wider 'corpus' of background references in which to base exploratory searches and a comprehensive 'snowballing' process for the more tight subject matter addressed by this review. In the electronic searches we further made, we have combined rehabilitation key-words (already outlined) with

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communication/interpersonal key-words, and key-words abstracted from the foundational psychological and behavioral change theory and models. Search was deemed completed and stopped accordingly the same 'saturation' principle. The 'saturation' level is naturally deeper for this review due its more focused subject matter and purposes.

2.3 Search Process (by themes): 2nd review

The differential features of the review process at this searching stage for the 2nd review relate with the following elements.

2.2.1 Searching in websites towards activating a 'snowballing' process

This 2nd review had the subject matter of much wider scope, recalling the state-of-action/science for healthcare quality and quality-initiatives. Therefore, we optioned to initiate our search process through the institutional websites that already have some installed capacity (e.g., updated programs, or recommended references) related with healthcare quality and quality-initiatives. These websites are the following:

- US Governmental Websites:
 - Agency for Healthcare Research and Quality (AHRQ);
 - United States Department of Health and Human Services;
 - Centers for Medicare & Medicaid Services (CMS).
- Independent Quality Bodies and Institutes Websites:
 - Institute for Healthcare Improvement (leading institute for quality/performance improvement);
 - National Quality Forum (quality-assessment consensus-building);
 - National Priorities Partnership (consensus for quality priorities);
 - Picker Institute & Institute for Patient- and Family-Centered Care (consumers-centeredness);
 - The Joint Commission and CARF (accreditation agencies).
 - The Commonwealth Fund (foundation with interest in health policy and healthcare quality).

Within some of the websites (e.g., institute for healthcare improvement: www.ihl.org) we were able to find a great source of web resources, organized bibliography (e.g., categorized

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by the six improvement aims: effectiveness, efficiency; safety; timeliness; equity; patient-centeredness), and links other relevant sources and information. We took advantage of this installed capacity towards activating our ‘snowballing’ process.

2.2.1 Stop-looking according to ‘Saturation’ Levels

The ‘saturation’ levels, which shape the decisions to stop-looking for new information, were achieved by the inability to find new relevant information from the multiple ‘snowballing’ processes. This feature was extremely relevant for this review, because the amount of potentially applicable references or information was the highest, accounting for the wide scope of the subject matter of this review, and the exponential increase of the literature and information regarding healthcare quality and quality-initiatives reflecting the quality ‘momentum’ raised over the last decade.

3- Selection Process

Due the wide scope of our subject matters and the characteristics of our search strategy, the selection process (beginning in concomitancy and with high interaction with the search process) remains as a crucial stage for the validity, representativeness, but also for the feasibility of the study.

Synthesis of the stage-applied principles:

- a. The selection process is one that clearly overlaps with other review stages. It starts concurrently with search process but is only finished in the later synthesis stage. Indeed, a last evaluation of the worth of studies is only established after all retrieved information is displayed to be compared and synthesized – not completely finished as a pre-qualification exercise (realist review).
- b. Selection is made through a critical and qualitative judgment of *worth*

embedding the following three factors (realist review):

- Representativeness and meaningfulness to the (sub-)topic under review, and broadly for the whole review purposes;
- Methodological quality in case of the empirical information;
- Updated or more recent information, particularly regarding state-of-action/science matters.

The qualitative judgment of *worth* is made without the need of an appraisal checklist. Indeed, within or without an appraisal checklist, this type of judgment is highly dependent on the reflexivity and subjectivity of the person undertaking a review. While this is a property that is actively avoided for instance by the Cochrane-style systematic reviews (reproducibility principle); this can be actively fostered in reviews addressing more wider, complex and contextualized subject matters such ours (realist review).

- c. The progressive new familiarity with the subject matter helps the author to operationalize the application of this kind of broad selection criteria (realist and scoping review).
- d. The level of the criteria for the selection process remains different for each (sub-)theme under review. These specific levels of the criteria for each (sub-)theme are established *post hoc* and iteratively (scoping review), yet always according to the previous general selection criteria.

For instance, we needed to open the selection criteria for less represented (sub-)topics, whereas the criteria is more tight for (sub-)topics that can actually have 'gold standards'. It means that in the areas of lower validity of the supportive references, we needed to collect and consider more of those references yet these areas remain with a lower level of validity, which might be acknowledged as a limitation on the discussion. However, precisely these differences can represent one of the fruitful features to be explored in terms of recommending further action (scoping review and realist review).

3.1 Selection Process: 1st review (including part- B) and 2nd review

Independently of the different subject matters, the selection process occurred in an equivalent fashion for the scope of the 1st review (including part-B) and 2nd review.

Recalling, in the box synthesizing the stage-applied principles, we have outlined the set of general criteria guiding our interactive search-selection process, meaning the process of selecting the articles or other sources of information for a full reading after the title consultation and a first appraisal of the abstract or main content. When we went to a full reading process, we also look for new references into the references-lists as a new source for the 'snowballing' process.

Due the inherent subjectivity of the application of our preliminary selection criteria, any information abstracted from articles that could potentially, according to our preliminary appraisal, influence to the final version of the review was, therefore, recorded to further analysis and synthesis. Indeed, only in a later synthesis stage, with an improved understanding of material displayed and of the subject matter, we defined what content and references must prevail, and what content and references are redundant or of less worth on a comparative basis with other information regarding the same theme (according to the above mentioned criteria) and could be eliminated through a parsimonious synthesis process.

4- Extraction & Display (by themes)

Extraction and data display by themes was facilitated by the clarification of the review scope, purposes, and by the overarching frameworks which *a priori* guided the definition of our major themes or categories for search and later synthesis. Therefore, this intermediate step of the review process was extremely influenced by the framework definitions we made early on.

Synthesis of the stage-applied principles:

- a. From a great amount of searched/selected information, the focus for extraction and display is mostly on get the critical added or differential value of the reviewed information, reducing the data into a manageable framework of extracted information (integrative review).

Extraction must focus in the most relevant content and sentences, complemented by the context of retrieved information. This latter aspect is critical for the later synthesis stage (realist review and scoping review).

- b. Indexing the extracted information from individual and multiple primary sources into a display that is made around particular variables, themes or categories, as broadly organized by our overarching frameworks (integrative review and framework synthesis).

- c. A display around themes or categories primarily assumes a contextualized text-form (realist review), but can progressively become transformed into a chart. Charts might represent a best manageable thematic display and an intermediate step towards the synthesis stage (scoping review).

4.1 Extraction & Display (by themes): 1st review (including part - B) and 2nd review

The stage-applied principles reveal most of the operational features applied to our 1st review (including part – B) and 2nd review process, regarding the extraction and display of data. Few additional specifications for each review process need to be described.

One of these, relate with fact that information extracted from a single source of information can be displayed and indexed to more than a single theme or category, representing cross-cutting subjects. This happened for all reviews, but more often for the 2nd review. For instance, information regarding the development and implementation of an information/communication technology, which could be extracted from the same kind of sources, was displayed according to the different facets it represented to various stakeholders' groups such as: suppliers (e.g., related to developers and vendors); research

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community (e.g., related to improvement/implementation science); macro-system (e.g., related to the business case for infrastructural investments for quality); micro-system (e.g., related to frontline adoption); or public policy-makers (e.g., related to input given to a development and deployment of national strategy for a system-wide adoption of these technologies).

Regarding the process of charting information, although employed in all these reviews, this was particularly crucial for the 1st review (including 1st review part – B), due the intrinsic conceptual scope of these reviews and the underlying intents to produce parsimonious and brief conceptual frameworks over the complex and fragmentally addressed subject matters of these reviews.

Finally, we might acknowledge that the display of information always involved some form of organization, being an intermediate step towards a comprehensive information analysis and synthesis.

5- Analysis and Synthesis (by themes)

A thorough and unbiased interpretation and comparison of primary sources along with an innovative synthesis of information represents the major features of this analysis and synthesis stage. Data from primary sources becomes compared and summarized into unified and integrated syntheses, made for each review, theme, category, variable or sub-topic addressed. Recalling, the major structure for synthesis and presentation of our results is based on the foundational frameworks of each review, which were previously outlined.

The application of methods typically used to the analysis and synthesis of qualitative information, as the ones outlined in the ‘Background’, were predominant at this stage, as fostered by our first box of overarching principles. Since we have used *a priori* frameworks, the specific approach for analysis and synthesis of qualitative information that better captures the process we broadly followed for these review is the ‘framework synthesis’ approach, which is the last outlined at the ‘Background’ section. Recalling this, is an approach primarily deductive in the scope (due using pre-existent frameworks for analysis and synthesis), but allowing for further inductive movements as new subject

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matter, themes, or categories of interest emerge with the data and along with the process. Furthermore, tips for analysis and synthesis of data given by the review approaches we were based on, were also considered through the process, as below outlined.

Synthesis of the stage-applied principles:

- a. Iterative data comparison examining data displays in order to identify and analyze patterns and relationships (integrative review).
- b. Iterative data comparison shall result in a progressive re-arrange of data - with critical appraisal and parsimonious integration – resulting in an innovative synthesis for each theme (integrative review and framework synthesis).
- c. Synthesis evolves from a divergent to a convergent thinking as author gains understanding of the emerging patterns for each theme (realist review).
- d. The analysis and synthesis of information are made according to the appropriate part of the thematic framework to which they relate (framework synthesis).
- e. We do not premature close the synthesis process. We were open to re-analyses as well as re-search and find new relevant information that can shape the scope of the review results, discussion and conclusions (integrative review).
- f. Using summarized charts to synthesize relations among constructs, representing an ultimate level of synthesis and abstraction (framework synthesis).

As we previously mentioned in the search and selection stages, at this level of analysis and syntheses we were able to exclude the less relevant, as well as the redundant, accessory, marginal or outdated information or sources that passed through the previous stages. Yet, it is worth noting that the contradictory or less consensual information was actively kept towards enlightening different perspectives or findings (most prevalent in the 2nd review).

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This complex synthetic and reduction process occurs optimally at this point, since this stage occurs later in time, when all extracted information is already displayed and preliminarily organized into a first manageable framework, and when the author has a deeper knowledge and understanding of the theme, the whole phenomenon, the literature available, and directions pointed to each specific subject matter. In short, at this point this kind of decisions are both better enlightened and informed than they could be at an earlier stage of selection.

Although there are similarities among reviews, such as the use of methods applied to a qualitative synthesis - and particularly a 'framework synthesis' approach - there are also differences among the reviews at this stage. These differences mostly result from the distinct underlying purposes. Below, we outline the applied differences at this stage according to specific purposes of the reviews.

5.1 Analysis and Synthesis (by themes): 1st review (including 1st review - part B)

The 1st review aims to build a conceptual framework that, on a literature-basis, preliminarily 'organizes' the different applied constructs into a comprehensive, yet parsimonious, understanding of what PAC Rehabilitation quality might conceptually mean. By its side, the 1st review – part B complements the scope of the 1st review, by specifically addressing the features of the PAC Rehabilitation interpersonal dimension of care, as shaped by hypothesized conceptual linkages with the PAC Rehabilitation health-related outcomes the review also aims to develop.

As we already mentioned into the 'Introduction & Objectives' section of this thesis, these reviews hold the underlying intent to be submitted to an international, peer-reviewed, scientific publication. Due this option we needed to condensate, integrate, and reduce the length of information and references provided by these reviews. Thus, we developed a great deal of synthetic efforts to put a great amount and diversity of information into a shortened length of words and references, and mostly into conceptual frameworks that comprehensively integrate major relevant and updated information, yet in a parsimonious way that could be easily captured, digestible, and understood across a range of relevant stakeholders.

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Draft manuscripts of both reviews, soon before the submission of this thesis, were seen by the editor-in-chief of the *Archives of Physical and Medicine Rehabilitation*. The mentioned editor-in-chief reinforced the suitability of these reviews to be submitted for this periodic, which is the rehabilitation periodic with the higher impact factor worldwide in the field.

Multiple synthetic and re-arrangements efforts were made over the draft results (also recurring to expert feedback, as later highlighted) until we could achieve the final review products. The multiple synthetic and re-arrangement efforts focused not only in the text organization and language, but in the illustrative charts as well. In the **Appendix 3** and **Appendix 4** we provide examples of the drafts respectively for the 1st review and 1st review – part B, already in a close-to-advanced stage of development, soon before the final form (presented in the ‘Results’). We denote that from the drafts presented in the appendixes and the ones presented as results, there were efforts at the text re-wording, heavily reducing the length of references, re-shaping the review organization, but only slightly re-shaping the content. These changes and multiple re-arrangements efforts occurring through the synthesis stage aim to achieve a smoothly meeting of the goals of the reviews, both for the purposes of this thesis and for the mentioned and upcoming submission process.

5.2 Analysis and Synthesis (by themes): 2nd review

Despite the process of this stage, for the 2nd review, has commonalities with the process of the ones previously outlined, the analysis and synthesis of the 2nd review presents some distinguishable features, and these differences reflect the different review underlying aims as well.

This 2nd review does not intent to produce an innovative conceptual framework such as the previous others. Indeed, at this 2nd review, we were less interested in ‘transform’ or ‘conceptualize’ information; instead we were more interested into produce a synthesis which focus on ‘summarizing’ and ‘organizing’ the great and disperse amount of available information regarding the state-of-the-science/action for healthcare quality-initiatives. Therefore, the results of this review shall assume the form of a representative and integrative summary of the actual perspectives, theory, evidence, policy or action trends for quality-initiatives, as particularly applied to the US context and broadly structured by a system-based ecological framework.

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The analysis and synthesis of information was focused on the major themes, trends, roles, challenges for quality and quality-initiatives from the perspectives of each group of stakeholders. Indeed, for organizing the analysis, synthesis and presentation of this review, we followed the pre-determined structure of stakeholder's levels and groups corresponding to our major foundational framework for this review (outlined into stage 1). Most of this structure remained untouched until the final review product. Only few on-going alterations and specifications into that original structure were made in order to capture the recent trends and reforms launched after the release of our foundational framework, meaning after 2001. We particularly refer to changes occurring at the macro-system level, namely the evolution for macro-integration and overarching regional health systems, as later exposed into the 'Results'. In the 'Results' section, we also provide a diagram with the organization of the final levels and groups of stakeholders towards allowing a better understanding of the structures we used for this review analysis, synthesis, and presentation.

6- Interpretation/ Conclusions

At this stage, we developed interpretations and conclusions, as made independently for each review and their specific-aims. The focus is towards the interpretation and conclusions for each review as seen independently of each other.

Synthesis of the stage-applied principles:

- a. Drawing conclusions requires and interpretative effort and a movement from a descriptive synthesis of patterns and relationships towards higher levels of abstraction, association of themes, and generalization (integrative review and framework synthesis).
- b. The interpretative effort is tied to the purpose, objectives, and foundational frameworks of the studies (integrative, realist and scoping review and framework synthesis).

The interpretative effort can be driven by the themes that have emerged from the data as well (framework synthesis).

- c. Conclusions are expressed in a way that supports strategic policy, practice or management decisions (realist review).

At this stage, the process was similar to the reviews being described so far. For each of these reviews we particularly explored the limitations, meanings, added-value, further implications, or needed future action that specifically relates with the aims and subject matter of each review. Due the wider potential implications and applications of the 1st review, this was the one which hold a higher variety and length of interpretative effort, conclusions and recommendations specifically for that subject matter. We shall further denote that the first module of the ‘Discussion’ section is the place in which the product of this stage is presented.

Finally, we outline that only later, in an ultimate stage labeled as ‘Integrative Recommendations’, we will provide integrative interpretations and future-oriented recommendations (thesis goal) emerging from the interaction among the all the complementary reviews (the ones being addressed so far, and the further outlined 3rd review), integrating the major conclusions we were able to achieve for the specific scope of each supportive review. This latter was the last step accomplished, and the last to be outlined in this ‘Methods’ section.

7 - Experts Consultation (except the 2nd review)

We went to a process of external consultation with experts, representing an extra-stage (optional) to our review process. Seeking experts’ feedback prospected the refinement of the reasoning, content and approach of the reviews, as well as constituting a form of validation of the adequacy of their embedded elements and whole product.

This stage was not applied to the 2nd review, which was the most extensive on the length and subject matters included, but mostly it happened because of the exclusive supportive,

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non-conceptual and less transformative nature of this review. Furthermore, possible refinements would not be as detrimental to the ultimate thesis product as they could be particularly for the case of the seminal 1st review shaping the whole thesis development. Indeed, the 1st review (also the first to be framed and developed) sets the conceptual tone for PAC Rehabilitation quality and quality-initiatives. In fact, the input received from experts, regarding this earlier review, seminally shaped the reasoning and choices made for the further reviews, and particularly for the later ‘Integrative Recommendations’.

Synthesis of the stage-applied principles:

- a. The purposes for consulting experts must be early and clearly established. The scope of these purposes can be on suggesting additional references, giving insights for meaning, as well as feeding readjustments in the preliminary findings (scoping review).

The process of seeking experts’ consultation took place only after a draft of the 1st review was completed, including the results, discussion, and conclusions for this 1st review. However, after the experts’ feedback, we were able to setback to previous stages of reviews development towards making re-adjustments accordingly. It illustrates how the process of developing the reviews is highly iterative and interactive: a back-and-forth process going from exploration towards refinement.

The purposes for consulting experts were defined to get feedback and insights towards accomplishing the following issues:

1. Ensuring the comprehensiveness and representativeness of the supportive information, for instance ensuring relevant information/references were not excluded;
2. Adjusting the degree of synthesis and presentation between comprehensiveness and the need to become parsimonious and understandable across different stakeholders’ groups and backgrounds.
3. Overall appreciation, insights, meanings, usefulness, potential implications or pitfalls.

The experts contacted for these purposes needed to be rehabilitation researchers from the US (the context of study development), with fields of interest and publications of relevancy

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for the subject matter. The fields of expertise of the group of experts might cover the domains the quality conceptualization addresses. In that sense, an e-mail contact was established with a set of widely recognized experts, outlining the purposes of the consultation and providing a draft for that review. Those experts were:

- Helen Hoenig:

A rehabilitation researcher leading the application of the Donabedian's SPO-model the field of health-services research in PAC Rehabilitation.

With Helen Hoenig, in particular, it was developed a long-lasting and on-going e-mail exchange and collaboration from earlier stages of framework development, which led to some substantial changes in the way the review was synthesized, chartered, organized, and presented. This collaboration evolved for a co-authorship regarding the purposes of submitting the review for a peer-review publication.

We have additionally assured the legitimacy towards being based on her seminal appliances of the Donabedian's framework to the field of the rehabilitation, with the proposed enlargement, alterations, and updates ⁽²⁰⁾. Furthermore, we have improved and assured the representativeness of the references we were based on for domains such as the structure of care ⁽²²⁾ and in the technical dimension of the care process ⁽²⁰⁾, as the more active fields of her research.

- Dale Strasser:

This is the researcher leading the more recent series of papers directly addressing the subject of quality-initiatives applied to rehabilitation ⁽⁴⁸⁾. He is also the author that introduces the notion of the rehabilitation "quality paradox" we were based on towards developing the review ⁽⁴⁸⁾; and the author that pioneered teamwork research and conceptualization in the field of rehabilitation ^(25; 26).

From Dale Strasser, we received critical insights from the 1st review which specifically referred to his areas of expertise. This is the team-work framing, measurement and improvement, as well as the potential applications of the review for quality-initiatives. Moreover, Strasser's feedback was also able to enhance the validity of the references we had about these domains of expertise.

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- Allen Heinemann:

A widely recognize and active leader in the field of PAC Rehabilitation outcomes research. He is also the deputy editor of the ‘Archives of Physical and Medicine Rehabilitation’, the most representative and impacting periodic in the field.

From Allen Heinemann, we received the acknowledgement of the alignment with the US quality-trends and a recommendation to develop further synthetic efforts into the draft in order to it could become suitable to be published in a leading publication, actively suggesting the *Archives of Physical and Medicine Rehabilitation* for doing that. Also possibilities for further operationalization were raised within the e-mail exchange.

Finally, in a very late stage of development, we felt the need to consult an expert for the specific matter of the 1st review – part B. This late consultation had, naturally, less seminal influence on the whole scope and final product of the thesis, but nevertheless it was able to provide a greater level of assurance of the representativeness of the information selected for the review, the overall usefulness and added-value of the review, of as well as for the adequacy of the reasoning and the integrative conceptual synthesis performed. The expert chosen to be consulted was Kathleen Kortte, which is a rehabilitation psychology expert and researcher from the Jonhs Hopkins University. Kathleen Kortte was among the most cited authors on the review, best covering the broadest array of integrated topics we could find. Following her input, we were able to make some refinements on the organization of the paper, but keeping the main issues as they were, according to a positive feedback over the topics we actively sought for consultation.

C- 3rd REVIEW PROCESS

The 3rd review has a distinct scope and approach of the previously outlined reviews. Therefore, we outline the process of the 3rd review in this independent and more straightforward sub-section.

1- Overview of the development of the 3rd Review

The 3rd review was designed to uncover the state-of-science and -action with regards to quality and quality-initiatives which are applicable to the PAC Rehabilitation scope, mostly considering the US context. We recall that our thesis goal is to produce recommendations to further advancements on a ‘system’ of PAC Rehabilitation quality-initiatives. Thus, we first need to frame the present state of things, science, action, possibilities and perspectives in order to go forward towards future action-oriented recommendations made not in ‘vacuum’, but over the actual state of science/initiatives, further complementing and taking advantage of initiatives under way or yet being prepared for the context addressed.

This *corpus* of literature addressed by the 3rd review is much more specific, restricted, and delimited than the references and information applied to the previously outlined reviews. This is a major reason for the methodological approach used to this review become somewhat different from the previous others. Additionally, as illustrated by our diagram of Objectives ([fig.1](#)), this 3rd review was partly built over the process, results, information, and references collected yet into the process of developing the previous comprehensive reviews.

2- Specificities of the 3rd Review Process

In this 3rd review, we applied the same major foundational framework that was used in the 2nd review (see stage 1 of the 2nd review). Indeed, the same underlying framework established the underlying structure and themes for the search, analysis, and the synthesis of this 3rd review. Moreover, the issues emerging from the results of the 2nd review were used as key-words for new databases search for this 3rd review, as mixed with key-words of the PAC Rehabilitation scope, namely those used in the search process for the 1st review. A ‘snowballing’ strategy was applied thereafter towards looking for the most comprehensive *corpus* regarding the state-of-science/action of quality and quality-initiatives applied to the PAC Rehabilitation scope. Nonetheless, we already had, or consulted before, most of the relevant references along with the development of the previous reviews, considering also

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the references of information further eliminated during highly selective synthesis stage of the previous reviews.

Since the number of the references applied to the more specific aims and subject matter of this review was comparatively lower, the selection, extraction and charting processes were more easily and quickly achieved, also due the more advanced stage of the thesis development and the subsequent enhanced author's underlying knowledge and understanding of the *corpus* of information and references under review. Referring to the analysis and synthesis, the use of the underlying framework of the 2nd review had the benefit of organizing the applied information with the same structure of the previous review. The option for using the same organizing framework has the additional advantage of facilitating the reading and assimilation process, since the reader who is looking at the 3rd review is already attuned with the structure, organization and rationale of the 2nd review, which is the one read immediately before.

Moreover, and perhaps more important, this option to use the same underlying framework facilitated the process of translating and adapting information from quality-initiatives with a general healthcare regard (2nd review) towards the more specific scope of PAC Rehabilitation (3rd review), when content and information apply and become conceptually relevant (supported by the 1st review) to the PAC Rehabilitation field as well. This was particularly evident for some levels in which the specific literature were scarcer, namely the macro-system/organizational level, but at the same time being one of levels in which the findings and solutions from general healthcare are not much or totally different of what apply to this level of PAC Rehabilitation.

Finally, we shall recall that this 3rd review is framed as an intermediate step towards the process of designing recommendations for developing an effective 'system' of PAC Rehabilitation quality-initiatives (thesis goal). The review results set the actual context in which our further 'Integrative Recommendations' might be embedded on, complement and interact with, what is already in place or being prepared for the field PAC Rehabilitation quality-initiatives towards its optimal development and advancement on a systems perspective.

D- INTEGRATIVE RECOMMENDATIONS

The final integrative step towards accomplishing the thesis goal

This last stage does not refer specifically to any of the reviews we have developed, but rather refers to the ultimate integrative step we make towards accomplishing our major thesis goal. Indeed, we could be based on the reviews products, their conclusions and the enhanced authors' understanding of the subject matter towards building the final integrative recommendations of this thesis in a future- and action-oriented perspective. These recommendations are outlined in the second module of the 'Discussion' section.

Synthesis of the stage-applied principles:

- a. Providing recommendations that integrate important conclusions of each sub-section of the review is an ultimate step to be made towards informing policy, practice, and management decision-making (integrative review).
- b. Making tentative recommendations with the cautions and contextualized grammar of policy discourse, rather than making statement that provide universal and irrefutable scientific truths or 'one size fits all' type of solutions or recommendations (realist review).
- c. There is an explicit room for debate about the precise scope of the recommendations and their implications (realist review).

Our previous reviews corresponded to our specific objectives and the integration of their results, insights, interpretation/conclusions, all underpinned the authors' ability to draw a set of recommendations on a strategic roadmap towards the advancement of a 'system' of PAC Rehabilitation quality-initiatives. These represent complex recommendations that do not result from a simple or straightforward sum of the products and recommendation of the three supportive reviews. Rather, we aimed to produce a set recommendations which shall not only contain, but mostly integrate, inter-relate and take the best whole achievable benefit from a set of smaller and independently framed support, conclusions, and recommendations from the previous reviews. These latter are to be integrated into our 'Integrative Recommendations' which shall be inter-related with each other and framed by a systems thinking perspective, therefore accounting for the inherent interfaces, potential

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synergies, emergent properties, or even accounting for the secondary effects and potential unintended consequences happening somewhere else in the system, coming from any of the ‘Integrative Recommendations’ or any of the smaller operational recommendations inside.

Adding to the complexity and system-based perspective, we also need to further acknowledge that the process of designing our integrative and future-oriented recommendation, also strongly rely on the authors’ subjectivity, meta-interpretative and creative efforts. It is precisely by the acknowledgement of this intrinsic subjective, creative, and open-to-debate nature of these recommendations that we present them within the ‘Discussion’ section. Indeed, the type of recommendations we make might not be definitive, universal truths, or even the ‘right’ or single solution or pathways to be followed. Rather, they shall be seen as tentative recommendations and potential systems-based solutions for a ‘system’ of PAC Rehabilitation quality-initiatives, which were tailored to a specific context and situation, but are intrinsically open to be further discussed, refined, specified, reshaped, fundamentally changed or even further eliminated in the face of others more promising, better supported, or consensual options. Certainly, this subject matter requires further enlarged stakeholder’s discussion and consensus. Our recommendations, and broadly this thesis as whole, might achieve its ultimate purposes if it is able trigger, catalyze and support - in some way or to a certain degree – a wide discussion and enlarged consensus-building process towards a strategy for PAC Rehabilitation quality-initiatives, in this case specifically applied to the context of the United States.

Finally, despite our major focus remains on a strategic roadmap and directions to possible take, a certain grade of tips for operationalization and implementation were provided accordingly to the knowledge, references, and information we were able to learn and abstract from the products and process of developing the supportive reviews and, in this particular case, from the process, product and subject matter addressed by the 2nd review. However, soon at the outset, we might refer that those operational tips may not be the unique or even necessarily the best way to operationalize the strategic recommendations provided. They rather illustrate or provide examples regarding how the strategies can be putted on the ground, showing they might be at least possibly operationalized. Indeed, we have tried not to stay completely strategic and somewhat vague on the recommendations to make, otherwise our set of recommendations would, in our perception, preserve a lower ability to drive discussion and further developments on this subject matter, something acting against the accomplishment of long-term goal of this thesis.

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