

Section Five

**DISCUSSION**

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This Discussion section is composed by two modules.

- A- Each Review Discussion: outlines the aspects to be discussed for each review, as analyzed independently.
  
- B- Preliminary Recommendations: represents the accomplishment of the thesis goal, as made by integrative and future action-oriented recommendations on a strategic roadmap towards an envisioned 'PAC Rehabilitation Quality System'.



## **EACH REVIEW DISCUSSION**

In this module of the Discussion section, we separately discuss the different reviews we present at Results, including the 1<sup>st</sup> review - part B. This review was only lately defined and accomplished to complement the scope of the 1<sup>st</sup> review.

In turn, the 1<sup>st</sup> review, mostly due their potential applications outside this paper, stays comparatively longer in discussion.

### **A- 1<sup>st</sup> REVIEW DISCUSSION**

In the 1<sup>st</sup> review we discuss the two major applications of the conceptual framework produced: serve as a conceptual referential for quality and the design of quality-initiatives; as well as outlining the quality-components with gaps in knowledge and research. Then, we outline its limitations and the required pathways to address such limitations.

#### **1 – A shared stakeholders referential of PAC Rehabilitation quality: supporting the development of quality-initiatives**

The conceptual framework for quality - mostly after developments addressing its limitations, further discussed - aims to serve as a common conceptual background for shaping the specific scope of PAC Rehabilitation quality, supporting the design quality-initiatives as cross-planned and cross-developed by multiple stakeholders' groups at the different ecological levels of healthcare systems - since multi-stakeholders partnerships are becoming strategically prescribed for the advancement of PAC Rehabilitation quality-initiatives <sup>(1; 2)</sup>. Therefore, beyond the supportive role for the further “preliminary recommendations”, such review can have a much wider field of applications.

### 1.1 Supporting the accomplishment of our thesis goal

The literature-based conceptual framework is a preliminary effort to broadly define, organize and conceptually inter-relate key common PAC Rehabilitation quality-elements in a SPO-sequence, starting with a comprehensive yet brief set of macro/delayed outcomes of specific interest.

Therefore, as a supportive step to the process of drawing “preliminary recommendations”, the conceptual framework outlined the specific PAC Rehabilitation quality-components. Such quality-components represent what should be addressed by PAC Rehabilitation quality-initiatives, defining the targets and content that a ‘system’ of quality-measurement, monitoring, reporting, improvement, and quality-aligned payment initiatives must promote. This characteristic and the areas of gaps the framework outlines (later discussed) represented the potential targets and content to be addressed our set of “preliminary recommendations”.

Furthermore, the conceptual framework outlines an important conceptual differentiation for quality-initiatives among the ‘macro/delayed-outcomes’ and the ‘continuum of process-outcomes’, we considered and made reflected in our “preliminary recommendations”.

Indeed, the set of quality-components fitting within the ‘macro/delayed-outcomes’ become suitable to be reflected in a routine external quality-monitoring system; while quality-components fitting within the ‘continuum of process-outcomes’ become suitable to be reflected in a uniform-data based internal quality-monitoring and periodic audits system - with both systems complementing each other and serving as data-basis for a comprehensive quality monitoring, reporting and payment system. Two different yet complementary “preliminary recommendations” reflected this rationale and conceptual differentiation.

### 1.2 Common conceptual background for all PAC Rehabilitation quality-initiatives

Particularly after refinement, consensus and empirical validation (further outlined), the conceptual framework could serve as a uniform conceptual background for the design and development of the wide-range of PAC Rehabilitation quality-initiatives far being the scope of our “preliminary recommendations”. These quality-initiatives could be designed and deployed at the different ecological levels: national system-level (external environment), at

an organizational level (macro-system), or at a team/service level (micro-system) - the major levels outlined in our 2<sup>nd</sup> and 3<sup>rd</sup> reviews.

If a consensual and shared conceptual background for PAC Rehabilitation quality would be achieved with further developments, it would have the enhanced benefit of every PAC Rehabilitation quality-initiative begin its design with a common comprehensive, yet parsimonious, notion of what PAC Rehabilitation quality conceptually means.

The existence of such uniform conceptual stating-point would prevent that important PAC Rehabilitation quality-elements becomes neglected, missed or prejudiced by quality-initiatives, thus preventing the so-called ‘unintended consequences’ of narrow-focused quality-initiatives by design <sup>(3; 4; 5)</sup>. Additionally, through being PAC Rehabilitation-specific, it might augment the specificity of applied quality- improvement, responding to the actually perceived “quality paradox” (Background) <sup>(6)</sup>.

Finally, such a framework can turn more visible potential synergies for multi-target quality-improvement. These and other specific features regarding this model application will be addressed in-depth along the following sub-sections.

### *1.2.1 The scope of appliance*

This is a model applied to the whole Post-acute services with a rehabilitation scope irrespective of the service site: a changing political trend in the basis of the development of US PAC political reform <sup>(7)</sup>. Post-Acute Rehabilitation starts with discharge from acute care and finishes with no more need for rehabilitation care, or only remaining need for long-term care. This is a patient-centric quality-definition of PAC Rehabilitation care (quality sub-populations receive across PAC settings), not much provider-based (different PAC settings peer-competition) quality definition that is still the mainstream in the US <sup>(7; 8)</sup>.

More recently, for the US context, increasingly fostered by the recent Patient Protection and Affordable Care Act - healthcare reform law <sup>(9)</sup>; there is a focus in enlarging the scope of appliance of quality-definitions to at least entail acute and PAC Rehabilitation for ‘episodes of care’ covering the continuum of care for different sub-populations treated, as managed under a single bundled payment. It shall dissolve some of the artificial barriers created among acute and post-acute care and enlarging the scope of quality and quality-initiatives

for the whole acute ‘episodes of care’, not confined exclusively to PAC Rehabilitation <sup>(10)</sup>. This change might require an enlargement of the appliance scope of this framework and the scope of PAC Rehabilitation quality-initiatives - further address in our “preliminary recommendations”.

Finally, and very important, we should denote such model was developed under a study addressing the US particular context, with illustrations recurring to the US actual context. However, a conceptual framework it-self relates with concepts, constructs and conceptual relationships among its elements; therefore it can be applied, as tailored illustrated, to any other national context. Indeed, it will be even desirable a non-national divisible understanding of what PAC Rehabilitation quality conceptually means, as for instance the ICF represent an international conceptual referential, model and language of what is functionality <sup>(11)</sup>.

### *1.2.2 Supporting PAC Rehabilitation cross-stakeholders quality-initiatives*

Policy makers, accreditation or regulatory agencies, or payers (external quality stakeholders) are mostly concerned with assure quality of care for (sub-)populations: mostly dependable on standardization and uniformity of practices. In contrast, services, teams or individual practitioners (micro-system) mostly concern with ‘assure’ quality to each patient: mostly lying on individualizing practices accordingly patients’ complex needs and preferences.

By its turn, the role organizations (macro-system) stands in between the needs to address system-level (external) requirements, while trying to support practitioners (micro-system) in their ability to be productive, efficient and at the same time delivering the best individualized quality of care for their consumers.

These different perspectives of quality and quality-initiatives, among stakeholders of different highlighted ecological levels, often create a perceived mismatch about what quality specifically means among these different stakeholders. This is for instance one pointed reason for the actual PAC Rehabilitation labeled “quality paradox” <sup>(6)</sup>.

A common conceptual framework of PAC Rehabilitation quality should foster a common understanding of what PAC Rehabilitation quality means, and what should be commonly

addressed by quality and improvement initiatives promoted at each and across highlighted levels - external, macro-system, micro-system – made around the needs of consumers, as well as build in consumers' quality perspectives<sup>(12; 13)</sup>.

A shared conceptual understanding of PAC Rehabilitation quality should also foster more active collaboration among stakeholders of these different levels in the development and deployment of wide-scale rehabilitation initiatives<sup>(14)</sup>, including quality and improvement initiatives.

For instance, it is recommended for general healthcare the use of multi-stakeholders quality-related initiatives (across stakeholders/ecological levels), ideally integrating practice quality-improvement, continuing professional development/education, and students' clinical education. It can potentiate synergies for actual performance and future capacity within super-ordinate quality and quality-improvement aims<sup>(15; 16; 17; 18)</sup>. The same could be applied to the PAC Rehabilitation field as supported by a super-ordinate conceptual framework of PAC Rehabilitation quality.

### *1.2.3 Shaping the scope of a quality-monitoring system*

Despite the framework can serve as a common referential for the design of specific quality-improvement initiatives, in the actual context the framework can be more directly and specifically applied to the design of a quality-monitoring system that is simultaneously comprehensive and actionable for the PAC Rehabilitation scope. This is a critical and seminal external-level quality-initiative driving all further quality-actions.

The framework provides the organization, constructs and conceptual relationships, which can constitute the conceptual background for a comprehensive yet actionable quality-assessment, monitoring, reporting and subsequent quality-aligned payment mechanisms (e.g. pay-for-performance). For instance, as preliminarily mentioned, the 'macro/delayed-outcomes' are suitable for routine outcomes-monitoring, for instance with measurement made by an independent entity, fostered by the new CARE tool<sup>(19)</sup>. In turn, the 'continuum of process-outcomes' can be suitable for routine internal quality-monitoring, as well as suitable to periodic external assessment and audit, for instance promoted by accreditation entities that might additionally assure structural conformity with quality standards. The

complementary among these two monitoring/assessment system would be reflected in two different yet complementary “preliminary recommendations” later presented.

#### *1.2.4 Specific and comprehensive framework, yet parsimonious and feasible to be applied into practice*

Since the beginning we had a major concern of trying to produce a synthetic framework - that would be feasible and suitable to be applied into practice. But we still remain concerned to produce a quality framework that is specific to the PAC Rehabilitation unique characteristics, yet comprehensive enough to do not neglect important dimensions of quality for do not stimulate narrow-focused quality-initiatives.

Indeed, by focusing on restricted yet measurable quality-aspects, and being based almost exclusively-based on ‘generalist’ quality-initiatives; the actual quality-initiatives (beginning with routine quality-monitoring) might be ‘assuring’ a kind of quality that does not reflect - or does not integrally reflect - the specific scope of the PAC Rehabilitation quality. It can have the ‘unintended consequences’ of systemic adaptation: tracked improvements in one area implying a reduction on untracked quality areas <sup>(3; 20)</sup>, such as the interpersonal dimension of care <sup>(21)</sup> – a dimension that was explicitly not present in previous rehabilitation SPO frameworks <sup>(22; 23)</sup>.

#### *1.2.5 Shaping the design of quality-improvement*

Quality-improvement initiatives can also be specifically fostered by a shared conceptual framework of PAC Rehabilitation quality. Particularly the macro-outcomes orientation in the construction of the conceptual framework and its preceding elements particularly facilitate a further quality-improvement appliance.

Indeed, after beginning the model with the description of macro-outcomes, we go ‘backward’, in a stepped-wised fashion, towards a sequence of its determinants to become included as quality-elements: the intermediate outcomes which immediately precede macro-outcomes; then the immediate outcomes responsible for the intermediate outcomes; the process dimensions responsible for the immediate and intermediate outcomes a in



continuous interaction (continuum of process-outcomes), and finally the more distal ‘structural’ determinants, mostly supporting process in its ability to achieve the best outcomes. Such ‘backward’ established conceptual pathways can serve as rationale for defining quality-improvement targets: a ‘forward’ chain of improvement effects ultimately reflected in improved macro-outcomes.

After a needed conceptual framework maturation and further specifications (later addressed), quality-improvement designers targeting the quality of PAC Rehabilitation services and care would have a conceptual support outlining what aspects they can address for PAC Rehabilitation quality-improvement, as framed within pathways and chain of effects for macro-outcomes achievement.

## **2- Shaping a supportive research agenda for PAC Rehabilitation quality and quality-initiatives, based on the framework identified gaps:**

A second, complementary, application of an S-P-O conceptual framework is the ability to shape a supportive research agenda for quality and quality-initiatives. We made reflected and integrated the features of our “preliminary recommendations”, but they are presented herein as independently discussed and analyzed.

Despite the frameworks definitions should be further and continuously refined and specified by new evidence (later analyzed); also a research agenda might be shaped accordingly to areas of weakness the framework construction uncovers.

Indeed, while gaps in the literature represent an actual major limitation; the ability to expose literature gaps is of great usefulness to highlight questions in need for being researched. Highlighting gaps in literature is in fact a secondary application of SPO-derived models, also applied to PAC Rehabilitation field<sup>(24)</sup>.

As previously noted in the field<sup>(25)</sup>, while the amount of research continually grows, the diversity of purposes without theoretical connection threatens the meaningfulness of such results. Therefore, research might benefit of using a uniform conceptual background of PAC Rehabilitation quality, not only guiding the planning and design of quality-initiatives,

but also to guide the enquiry process for health-services, outcomes, and practice-based research purposes.

Indeed, highlighting the determinants and best pathways for optimal outcomes achievement is actually the most critical matter for PAC Rehabilitation research<sup>(26)</sup>. There is a great need to opening what is commonly called as the rehabilitation ‘black-box’, ensuring a more granular level of understanding of the most effective and efficient determinants of PAC Rehabilitation outcomes<sup>(27; 28)</sup>.

The actual empirical weaknesses of the framework can serve as a conceptual starting-point to the enquiry process that shapes the scope of new research-lines (complementing the on-going research agenda) we used for instance to ground our further “preliminary recommendations”. Such new lines of research shall be directed to areas of clearly sub-developed knowledge and supportive evidence for what determines the best outcomes and quality of care: an evidence-based practice and policy-making perspective<sup>(26)</sup>.

### 2.1 Interpersonal dimension and psychosocial engagement outcomes and the need for developments:

A particular part of the model in which supportive existent evidence is more limited, somewhat disorganized and with few studies addressing the linking with macro-outcomes is the field of the specific PAC Rehabilitation ‘interpersonal dimension’ of care and its respective immediate and immediate outcomes we labeled as ‘psychosocial engagement outcomes’. Such identified gap led us to the development of the 1<sup>st</sup> review - part B, which precisely begins to organize and address in-depth the information applied to this ramification of the quality framework (later discussed in its own sub-section).

Looking at the framework as a whole, if a part of it remaining sub-optimally addressed by research evidence the inter-play of PAC Rehabilitation quality elements (macro-outcomes’ determinants) cannot be fully understood or analyzed. Thus, it remains critical the advancement of such specific knowledge also for the understanding of the inter-play of PAC Rehabilitation quality and outcomes determinants.

## 2.2 Uniform quality-monitoring of consumer-centered outcomes (patient and family)

As posted in results, in US there is not yet a uniform measure for the specific and whole PAC Rehabilitation satisfaction/experience – uniformly assuring a consumers-centered outcomes/quality-monitoring across the PAC Rehabilitation services. Such gap and those related with the ‘interpersonal dimension’ of care (a major satisfaction/experience determinant) can threaten the patient/family-centered quality-dimension<sup>(29; 30)</sup>, which can be inadvertently even worsened by narrow quality-monitoring<sup>(4)</sup>.

Additionally, family/caregiver outcomes such their own-(HR)QoL and experience/satisfaction might be considered for routine quality-monitoring in cases in which they are a major target of care, operationalizing a desirable whole family-centered rehabilitation perspective<sup>(25; 31; 32)</sup>.

## 2.3 Developing and improving together the less-educated/trained quality-dimensions

Typically unaddressed by formal education/training from many years, improvements in the *interpersonal dimension*<sup>(33; 34; 35; 36)</sup>, as well as in the *team-work process*<sup>(6; 37; 38)</sup>, could potentially produce transformational, rather than just evolutionary or marginal quality-improvement gains. Both dimensions are supportive of optimal *technical dimension* implementation (e.g. *individualization* and *coordination of care* components); as well as interpersonal dimension might also facilitate *psychosocial engagement outcomes* interfering with a broad range of rehabilitation health-related outcomes<sup>(39)</sup>. Thus, despite yet to be developed and more strongly empirically tested, it is conceptually expectable a positive chain-of-effects towards optimal macro-outcomes beginning with transformational improvements in such dimensions.

Additionally, interpersonal and team-work dimensions are seminally supported in same basis of communication and relationship improvement competencies<sup>(40; 41)</sup>. Thus, a synergic (efficient) improvement could be achieved addressing these two dimensions together – then with specifications applied to PAC Rehabilitation specific users’<sup>(39; 42)</sup> and team-work interactions<sup>(43; 38)</sup>.

Such improvements could be made by practice quality-improvement, interprofessional continuing education, and trainees education, or mostly those combining each other in

overarching projects<sup>(16; 17)</sup>, for instance taking principles from the rehabilitation-suitable interprofessional education/training-wards, which integrates goals from different process-dimensions<sup>(43; 44; 45; 46; 47)</sup>.

### **3- Conceptual framework limitations: immediate pathways for its enhancement, refinement and validation**

So far, we had discussed major underlying applications of the conceptual framework. But while discussing these aspects, we shall denote these underlying applications should be supported not exactly in the actual literature-based conceptual framework features; but on its further refinements, consensus and on-going empirical-based updates, specifications and validation - action addressing actual framework limitations.

#### 3.1 The literature-based quality conceptual framework limitations

This literature-based conceptual model integrates information from a wide-scope of frameworks, studies and papers applied to a comprehensive PAC Rehabilitation quality-scope. It endorses the inherent validity of the foundational frameworks and supportive references used, but it also endorses a set of limitations. The framework major limitations are therefore the following:

- Potential lack of representativeness of the state-of-the-knowledge applied to framework construction; as well as potential failures in the synthesis process in an effort to achieve a comprehensive, yet parsimonious and actionable, conceptual framework for PAC Rehabilitation quality and quality-initiatives (gaps in the methodology: review process and model construction);
- Gaps of specific knowledge and literature available; which for instance include different levels of evidence, conceptual clarity and specificity of papers (literature *corpus* and knowledge gaps, varying across quality-domains);
- The inherent limitations of an exclusive literature-based conceptual framework for achieving its underlying purposes. These are mostly represented by a lack of input

from an enlarged experts-panel and stakeholder consensus in the establishment of framework definitions.

Such features would be critical to underpin its intended use as a common conceptual background for the design of PAC Rehabilitation quality-initiatives across stakeholders' groups and levels.

We further analyze each of these limitations as closely tied to the respective action recommended to address the framework gaps. Such limitations and subsequent action will be also reflected in the scope of our further "preliminary recommendations".

### *3.3.1 Methodological gaps: model refinement by interdisciplinary experts' panel*

There are methodological gaps and potential bias in this review process. First, there is clearly a potential selection bias in the references selected and used for framework construction: we cannot absolutely assure selected references integrally reflect applied PAC Rehabilitation state-of-the-knowledge. It happens due the wide study scope, as well as the intrinsic heterogeneity of disability/rehabilitation research field, often impeding Cochrane-style systematic reviewing processes for data collection<sup>(48; 49)</sup>.

Second, there is also great room for synthesis bias. Indeed, besides comprehensive, a PAC Rehabilitation conceptual framework shaping the scope of quality and quality-initiatives needed to be also parsimonious to become actionable – meaning operational into routine quality-initiatives. Mostly the integration, interpretative and transformational efforts, made by a single author (despite supported by a consultation of a selected panel of experts), clearly represents a potential source of analysis and synthesis bias. Thus, also the synthesis process might require refinements by inter-disciplinary expertise.

Indeed, the consultation of experts we made for this review begins to address some of the potential limitations of the review methodology. However, it is certainly short for the wide-scope of knowledge we employed in the framework construction; and particularly considering the impact intended for this framework.

Thus, a first further initiative to enhance the literature-based representativeness and validity of the synthesis process would be assign an inter-disciplinary experts' panel for making granular-level refinements in model definitions and its underlying support. Such inter-

disciplinary experts' panel should cover each of the specific areas and disciplines of expertise employed in the different quality-domains. For instance such panel might include specialists (both within and outside the PAC Rehabilitation scope) from knowledge fields such as: behavioral; interpersonal relationship and communication; team-work, technical care for major treated conditions, management and structural requirements, educators, rehabilitation research and outcomes measurement, and patient-centeredness. Additionally, the presence of representatives of the wide-scope of professional disciplines involved in PAC Rehabilitation care should be assured, facilitating early commitment with common quality definitions.

The panel should also include quality-experts (not necessarily in the PAC Rehabilitation field) adding operational knowledge of practical aspects for quality-measurement, reporting improvement, use of electronic data-systems for quality, and research among many other operational features and practicalities. Important to note is that such practicalities should not determine the conceptualization of what is quality, but just helping to link possible immediate and future applications, or practical consequences, of alternative conceptual definitions. Yet, conceptualization (supported by further consensus among stakeholders) should remain as 'the' determinant element of for what consists, or should consist, a PAC Rehabilitation service and care of quality.

Using experts as source of granular refinement enhanced the validity of the presented literature-based conceptual quality framework. However, the conformity with the present state-of-the knowledge it is not enough for its underlying purposes.

### *3.3.2 Stakeholders' consensus about a PAC Rehabilitation quality conceptualization*

Translating a literature-based framework (even after refined by experts) into a shared stakeholders' conceptualization of PAC Rehabilitation quality requires another step – a stakeholders consensus-building process achieving a shared understanding and enlarged agreement on what PAC Rehabilitation quality conceptually means.

The stakeholders included for consensus-building would be at least representatives of: PAC Rehabilitation practitioners of different disciplines; organizational service leaders, purchasers; and mostly consumers (patients and families) in a centric-position.

In synthesis, enlarged stakeholders' consensus on framework features <sup>(50; 23; 51)</sup>, made around consumers for patient- and family-centered definitions <sup>(12; 13; 52; 53; 54; 55)</sup>, should ensure enlarged agreement and comprehensiveness of elements included in quality framework - yet brief to be operational in quality-initiatives. It shall conceptually reflect what PAC Rehabilitation specifically means in whole its domains, thus representing what quality-initiatives should measure, report and improve.

#### **4- Framework evolution and specifications along time**

Even considering the paths pointed to immediately address the conceptual framework limitations, the model should not remain absolutely rigid along time, but rather able to be changed accordingly to on-going development of its evidence-base, as well as by renewed conceptual paradigms, stakeholders' perspectives and formative evaluations.

##### 3.1 Framework refinement by stakeholders along time

Periodically - or when new/changed relevant information, conceptualizations or perspectives are raised - an update of a consensus-based process might revise made definitions accordingly to the state-of-the-knowledge, perspectives and experience/data of previous conceptual definitions made operational into quality-initiatives. The consensus-building process might inclusively advance to a continuous stakeholders partnership, as we will make reflected in the first overarching "preliminary recommendation" later addressed.

##### 3.2 On-going empirical updating, refinement, and specification to sub-populations

Beyond the stakeholder's consensus, the conceptual framework definitions should be refined along time according to evidence updates, and being open to reflect progressive granular-level (specific knowledge) achieved by on-going research advances and new relevant empirical data.

Introducing a more granular level of specification into framework definitions can origin the development of specific quality-frameworks as applied to different PAC Rehabilitation sub-populations treated. Such derived models can outline specific evidence, data, information, guidelines, emphasis and perspectives for different sub-populations treated - useful for applied quality-initiatives and particularly quality-improvement <sup>(56; 57; 58)</sup>; yet benefiting (in terms of stakeholders understanding, training, education, assessment, improvement, replication, reporting, payment and other quality-aligned initiatives) of being uniformly framed under same overarching PAC Rehabilitation quality conceptual framework - such as the ICF represent a shared referential for functionality that is non-contrition specific <sup>(11)</sup>, yet allowing the development of the 'ICF core sets' for specific sub-populations <sup>(59; 60; 61)</sup>.

In other words, the on-going empirical-based refinements should not only contribute to update and shape the PAC Rehabilitation overarching conceptual framework, but also allowing for specifications on different sub-populations treated, ultimately originating derived quality frameworks for these sub-populations.

Finally, we should denote the research advances actually expected at PAC Rehabilitation field (major actual research-lines in the 3<sup>rd</sup> review: Research Community) would be able to contribute to a continuous updating and more granular knowledge of the PAC Rehabilitation quality and macro-outcomes determinants, thus enhancing the empirical support of a PAC Rehabilitation quality framework.

## **B- 1<sup>st</sup> REVIEW – PART B: DISCUSSION**

As previously noted, the 1<sup>st</sup> review - part B was the last review to be framed (it was not in our initial set of specific aims) and the last to begin its development and becoming accomplished. It was built specifically to address the ramification of the conceptual framework of 1<sup>st</sup> review that was less covered by the available literature, thus complementing its scope.

Indeed, considering the care dimensions of the 1<sup>st</sup> review, we can for instance outline that in the technical dimension of care there is a need for more granular knowledge about: what optimally and efficiently works, when it works, specifically with whom, delivered by



whom, in what sequence, and under what pre-conditions and circumstances. However, this is a matter beginning to receiving answers from on-going practice-based research methods as differently applied to major PAC Rehabilitation treated conditions <sup>(27; 28; 62; 63; 64)</sup>. Therefore, the PAC Rehabilitation technical process research and applied quality-initiatives are yet following their own developmental pathways, also supported in the recent advances in outcomes measurement and risk-adjustment of the last years <sup>(65; 66)</sup>. The PAC Rehabilitation team-work process, by its, turn was receiving, mostly in the last decade, some advances that puts it yet into a position for quality-improvement, with a path already being activated <sup>(38)</sup>.

However, there is one care dimension which seems out of the scope of a specific, and planned, PAC Rehabilitation research agenda, thus with less evidence-base and diffuse perspectives, knowledge, and specifically applied information. It happens in contrast with the advancements being made in general healthcare in terms of interpersonal dimension conceptualization <sup>(29)</sup>, and empirical understanding of relationship with outcomes <sup>(67; 68; 69; 70; 71)</sup>, also with particular advances in specific healthcare areas such in the cancer care <sup>(72)</sup>. The development of the interpersonal dimension of care includes pathways of immediate and intermediate variables linking interpersonal process with of health-related outcomes <sup>(73)</sup>. Such rationale underpinned the development of this complementary review.

According to such background scenario, we discuss the review major added-features. Then, we outline major review limitations as complemented by possible pathways to overcome its limitations.

### **1- Review added-features**

It is widely recognized the interpersonal process could strongly influence consumers-centered outcomes, meeting patient/family-centered quality-dimension <sup>(74)</sup> – which is valuable only by it-self <sup>(75; 55)</sup>. However, in this review, we addressed the potential impact the ‘interpersonal process’ could have on rehabilitation ‘health-related outcomes’, organizing applied theory and evidence into conceptual pathways and mechanisms by which it could happen.

On a first major pathway, we support that the called ‘technical outcomes’ could be influenced through enhanced active engagement in rehabilitation care, it-self determined by a set of motivational and volitional variables (psychosocial determinants). However, we also pointed out in results that some ‘psychosocial determinants’, such as specific self-efficacy cognitions, can also directly influence specific activity levels such walking-behaviors, balance and falls.

On a second major pathway, ‘psychosocial determinants’ and an expanded notion of ‘rehabilitative engagement’ (including adaptive coping and empowerment patterns) influences a set of ‘psychosocial adjustment outcomes’ for a comprehensive, holistic and a desirable whole family-system-centered rehabilitation.

Conceptual pathways were established in “backward” fashion, beginning with the ultimate outcomes of interest; then envisioning causal mechanisms (direct and mediated conceptual pathways) by which interpersonal process could operate on these. Thus, we used an outcomes-based (or endpoints-based) perspective for delimitating the scope and functions of ‘interpersonal process’ it-self<sup>(29)</sup> - which might be rehabilitation-specific<sup>(21)</sup> - being preliminary delimitated in this review, as well as in the conceptual framework (1<sup>st</sup> review), both in a outcomes-based perspective.

Besides supported on existent applied rehabilitation evidence (yet scarce and somewhat disaggregated), we also made such pathways reflecting major psychological/behavioral-change models, thus being empirically and theoretically-informed pathways for improving the psychosocial engagement outcomes, despite more in-depth empirical support will be clearly required, as later addressed.

Finally, the outlined conceptual pathways could trigger interest on developing and testing hypothesis for improving different rehabilitation outcomes, on different rehabilitation sub-populations, through the ‘interpersonal process’ improvement. It is the kind of studies that might test the ultimate value of the whole chain of effects hypothesized, ideally also studying the pathways and variables in between. But such studies are dependent on previous developments of the interpersonal process conceptualization, operationalization, measurement, education/training and improvement/implementation initiatives, based on PAC Rehabilitation specific interpersonal guidelines - yet to be systematically developed. This is a matter we directly address with one of our further “preliminary recommendations”, as well it will be independently analyzed below.

## **2- Review limitations and pathways to overcome limitations**

Within construction of hypothesized conceptual pathways, we integrated an enlarged body of applied theory and evidence. However, such as in the 1<sup>st</sup> review, we did not use a systematic (Cochrane-style) review-approach, rather we used a complex-based tailored review approach that, as pointed in Background and Methods, better match with our intents. However, we still have acknowledge the inherent limitations of non-using a Cochrane-style systematic review approach, which are similar to those already mentioned for the 1<sup>st</sup> review, in terms of non-assuring total representativeness of references and reproducibility of the process.

Another limitation which can be pointed is that such review used the quality conceptual framework developed in the 1<sup>st</sup> review as major framework foundation. Yet, the framework still has a lot of refinement and validation steps to be made - as exposed in 1<sup>st</sup> review discussion - until become a shared stakeholders' conceptual understanding of quality in PAC Rehabilitation. Thus, this 1<sup>st</sup> review part – B endorses any bias in the features of the quality framework we used also for this review.

Another major limitation we can point to this review does not relate with the methodological approach, but rather relating with a fundamental assumption underpinning its conception. We mean the influential role of PAC Rehabilitation 'interpersonal process' for the dynamic/interacting 'psychosocial engagement outcomes', outlined along the review.

These dynamic 'psychosocial engagement variables' are better seen as reflecting an intricate interaction among 'contextual factors', 'technical process' and the 'interpersonal process' along rehabilitation - making difficult the task of empirically dissect the differential contribution of these sources on the 'psychosocial engagement variables', thereby on the 'health-related outcomes' by a mediated pathway.

However, with such regards, the few specific interventions at rehabilitation 'interpersonal process' level already showed communication improvements<sup>(21)</sup>, and ultimately improved 'health-related outcomes' in result of improvements made in particular aspects of the

‘interpersonal process’ (76; 77; 78). Such last type of studies, and mostly improvements of a whole-framed ‘interpersonal process’ (based on specific guidelines development further addressed), might represent an indirect empirical pathway (improvement-based) of supporting knowledge about the ‘interpersonal process’ influence (and its active ingredients) on the different PAC Rehabilitation ‘health-related outcomes’.

This kind of improvement-based designs might be the most meaningful solution for testing if indeed, and how much, the PAC Rehabilitation ‘health-related outcomes’ could be improved by seminal improvements in the ‘interpersonal process’; in turn with its own development and improvement based on the hypothesized mechanisms by such influence could happen.

### 2.1 Systematically developing PAC Rehabilitation interpersonal process guidelines leading to effectiveness testing

The recommended improvement-based solution for testing the linkage between the PAC Rehabilitation ‘interpersonal process’ and ‘health-related outcomes’ of care is first dependent on a set of systematic developments yet to be made.

Indeed, systematic developments on the PAC Rehabilitation specific ‘interpersonal process’ delimitation, guidelines and tools developments might be made to underpin such kind of recommended studies. The systematic development might consist on a systematically-organized research agenda, involving interdisciplinary experts’ and enlarged stakeholders’ consensus-building towards a systematic definition of core inter-disciplinary rehabilitation interpersonal guidelines (rehabilitation-team as major unit – 1<sup>st</sup> review). This might be a process underpinned not only by general communication and interpersonal guidelines for general healthcare, but also facilitated by the kind of “backwards” definition of the PAC Rehabilitation ‘interpersonal process’ we preliminarily made by hypothesizing empirically and theoretically-supported conceptual pathways with desired outcomes of PAC Rehabilitation care.

Furthermore, these ‘interpersonal process’ guidelines need to fit and ideally facilitate workflow and other professional/improvement demands, otherwise later implementation

would be easily mitigated by PAC Rehabilitation practitioners <sup>(6)</sup>. This is an important consideration for the design of such guidelines.

Therefore, the interpersonal process guidelines might consist on core PAC Rehabilitation inter-disciplinary functions, tasks and approaches; complemented by tasks addressing specific patterns of users' needs, preferences and circumstances <sup>(79; 80; 81)</sup>, yet allowing room for further individualization – e.g. communication functions shifting alongside rehabilitative changing moments, goals and activities <sup>(82; 83)</sup>.

Concomitantly with guidelines development process, there should be also developed and tested specific (sensible) measurement tool; as well as further developed and tested team-based guidelines implementation, improvement-based and education models and interventions <sup>(76)</sup>. Only then, an improvement-based effectiveness testing could be optimally made.

The improvement-based study designs might become operational through in-site and across-sites time-series analysis (including outcomes-impacting analysis) as a gold-standard methodology on improvement-based interventions <sup>(84)</sup>. Effectiveness testing might start on single, then on multi-center/programs designs - possibly revealing different results in such kind of talking-based, complex-to-define <sup>(85)</sup>, rehabilitation interventions <sup>(86; 87)</sup>. Additionally, replications of improvement-interventions are desirable to increase generability, despite allowed context-adaptation of improvement-interventions around common active ingredients <sup>(88)</sup>.

Recurring to in-depth case-studies and realist evaluation research <sup>(89; 90; 91)</sup>, multi-center research could outline the complexity of suitable and hindering improvement conditions <sup>(82; 92)</sup>, for instance outlining specific micro-system inter-group relationships and other contextual features interfering with implementation <sup>(41; 93; 94)</sup>.

Finally, the facilitative or hindering role of macro-system and external features (e.g. policy, funding, professional education and credentialing, external quality-monitoring and reporting) for optimal PAC Rehabilitation interpersonal care might be studied and addressed on a systems re-design perspective to make such potential improvements reliable into regular practice <sup>(74; 95; 67; 96; 97; 98; 99; 4)</sup>.

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## **C- 2<sup>nd</sup> REVIEW DISCUSSION**

In our 2<sup>nd</sup> review we aim to highlight the actual major state-of-the-science and -action for quality-initiatives in general healthcare. According to such wider, integrative and complex purposes, we build a review approach with similarities with the review approach of the 1<sup>st</sup> review (including 1<sup>st</sup> review – part B), as outlined in Methods. Besides different rationales and applied differences in the search strategy, the major underlying difference in the scope of these reviews were the more summarizing purposes of this review, in compare to the more conceptual organizing scope of the others mentioned.

The wide range of applied content to this review was synthesized accordingly to stakeholders' groups, meaning their perspectives and roles about quality-initiatives. Indeed, as outlined in Methods, the framework used to underpin the 2<sup>nd</sup> review was the same ecological framework underlying on the supportive review of the landmark 'quality chasm' report and recommendations <sup>(75)</sup>.

### **1- Review added-value**

In contrast to the 1<sup>st</sup> review (including 1<sup>st</sup> review – part B), this 2<sup>nd</sup> review did not have the parallel intent of being published in a peer-reviewed periodic towards becoming influential for further research and quality-action. Indeed, the great primary focus of the development of this 2<sup>nd</sup> review was to support and enhance the ability (in the case the author ability) to design the “preliminary recommendations” corresponding to our thesis goal, as informed by the healthcare state-of-science and -action in quality-initiatives. Therefore, ultimate effectiveness of this 2<sup>nd</sup> review is mostly reflected in the way it supported the draw of such “preliminary recommendations” - we focused the discussion of its added-value in this perspective.

In a formative view, we can easily outline that not only the results, but also the whole process of developing the 2<sup>nd</sup> review were highly influential in the process and content we further present as “preliminary recommendations”, either directly or through mediation of

the 3<sup>rd</sup> review, which integrated some features organized or synthesized in the previous reviews.

Indeed, without being aware and accurately informed of the actual major features and initiatives being taken for quality and quality-initiatives in general healthcare, we would not have an action-modeling to ground recommended action addressing areas of weakness or challenge identified in other reviews. Additionally, the set of recommendations would not be framed in the activities being promoted for general healthcare (in which PAC Rehabilitation is embedded) giving the needed systems perspective. In addition, we wouldn't be able to outline potential synergies between recommended initiatives for PAC Rehabilitation and those occurring or being planned in general healthcare. Therefore, recommendations in such scenario would appear isolated in a fragmented PAC Rehabilitation scope – contrary to the integrationist trend.

Finally, successful initiatives, as well as some failures or concerns yet noted in general healthcare after its deployment in the field, we were upfront informed of the subject matters that are critical for further potential success, failure or unintended features in the set of proposed recommendations – since the development of the 2<sup>nd</sup> review let clear the idea that the ultimate success of this kind of these initiatives heavily depends on the way recommendations are developed and applied, beyond the general scope of their strategic positioning and definition.

The synthesis-stage and final results of this 2<sup>nd</sup> review were critically important to organize thinking accordingly to the diverse array of applied information, turning the enormous amount of applied sources and information into a single manageable paper, containing and synthesizing all the most relevant information, references and perspectives – an actualized 'big picture' for the scope of healthcare quality-initiatives. Without such synthetic effort, we would stay somewhat lost in amount of trends and tips to be reflected in the "preliminary recommendations". Achieving the final review product leads us to a clear whole and organized view of the subject matter, something we did not completely had in the middle of the process, when we naturally felt somewhat lost in the amount of continuously growing information collected.

In fact, a synthesized and updated 'big picture' of quality-initiatives was a kind of supportive information we could not abstracted from any previous report we had knowledge about. For instance, the wide review supporting the landmark 'quality chasm'

report had more than a decade of existence. In contrast, our purposes were to retrieve the actual state-of-science and-action in a field of rapidly changing action and trends. Indeed, in such a period of time a lot of new initiatives were taken - many in response to the call of the 'quality chasm' report. We can easily get a picture of it by looking towards the 2<sup>nd</sup> review references list, with the great majority of references dating after the year 2000.

Besides, there are many reviews addressing specific themes regarding quality-initiatives (many are cited along the review), yet such reviews do not provide the 'big picture' and the broader systems thinking applied to quality-initiatives we intended to gather. Furthermore, even if it the desired kind of review existed, most of the insights and intrinsic knowledge the author obtained from conducting such the whole review process would be lost, hampering the basis of the creative process involved in the design of the "preliminary recommendations"

As being synthesized by stakeholders' groups in different ecological levels, with a focus on their roles and perspectives for quality and quality-initiatives, this review was able to support the development of recommendations that try to equitably consider the roles and perspectives of the different stakeholders, as balanced by multiple demands each stakeholders' group face in today healthcare era.

Finally, a synthesis made by stakeholders' groups and their perspectives can be further used to inform consensus-building processes around quality-initiatives. Indeed, it might be used as common reading for all stakeholders' representatives, mostly with the intent to enhance a broader view and understanding of each other roles and perspectives for quality and quality-initiatives – a preliminary step for a consensus to happen.

## **2- Review limitations and pathways to overcome limitations**

A first limitation of this 2<sup>nd</sup> review is that we cannot assure every important reference regarding the review purposes were consulted, thus reflected in its final results. This is due the very wide subject matter and respective review approach, being a feature common with the other reviews yet discussed, since they were based in similar approaches.



Despite it remains as a major review limitation, the use of multi-institutional sources for the ‘snowballing’ process leads us to a certain degree of confidence that the great majority of most relevant and impacting sources were consulted. The institutional websites consulted represent leading activators in the field of quality, quality-initiatives and improvement. Therefore, their own-run initiatives, updated white papers, and recommended references lists represent and cite the most updated state-of-art within the specific field of quality-initiatives they are specialized on.

Furthermore, we made use of many recent reviews, including systematic reviews, for many (sub-)topics under review, being a reference element in which we could rely on. Indeed, in this references lists of these recent reviews, it was displayed a comprehensive set of research made under each particular subject addressed we used to further consult.

Finally, following the multiple sources within the ‘snowballing’ process we were often finding references and citations that we had already seen. At such point, we were coming closer to the ‘saturation’ point.

A second major limitation we can point to this review refers to the extent of detail provided, which is less than optimal for description purposes. It relates with the option to use less focused lens mostly towards a synthesis process, with the major intent focused on provide the emergent ‘big picture’, rather than proving herein all the detail in each particular subject addressed. Either way, the reader wanting for more detailed information in any particular subject, might seek the references cited, in which we rely on for further specification. In that sense this 2<sup>nd</sup> review can also serve as a text-organized source for readers who want to seek more detailed information in matters of their particular interest, as well as entering in others areas of less knowledge until there.

A third major pointed limitation of the 2<sup>nd</sup> review relates with the fact that we have focused the review in the US context. Despite we also used some references and insights from experiences in other sides of the world; they were mostly framed within the US healthcare system features and challenges. It might not represent a salient limitation for the direct scope of this study – it-self directed and envisioning recommendations for the US context. But it might represent a great limitation as seeing this review independently, or supporting the development of recommendations or consensus-building processes for other contexts than the US.

A final major limitation, intrinsic to its scope, is the short-lived validity of its definitions. Indeed, in the gap of time (about 4 months) between the review and the “preliminary recommendations” were fully closed, some relevant information could be released with the ability to influence either the review results as the later “preliminary recommendations”. It could be particularly prevalent since this field is in the agenda of healthcare priorities, thus constantly updated with new applied information. Trying to minimize such limitation, yet not fully addressing it, it was subscribed the e-mail updates the institutional website of wider representativeness in improvement field ([www.ihl.org](http://www.ihl.org)), as well as being periodically checked the website for relevant updates.

This last presented limitation would imply constant updating efforts if the review would be intended to have further use in any kind of supportive roles, others than those applied herein in this specific context and time frame.

#### **D- 3<sup>rd</sup> REVIEW DISCUSSION**

The 3<sup>rd</sup> review can be framed as in intermediate step towards the further presented “preliminary recommendations”. It happens due the positioning before recommendations draw and after the 1<sup>st</sup> and 2<sup>nd</sup> review; as well as because it partly integrates features of the previous reviews, reflecting a review process distinct from others (Methods). In the following sub-sections we discuss the added-value and the limitations of this 3<sup>rd</sup> review.

##### **1- Review added-value**

The specific aim of such 3<sup>rd</sup> review was to outline the actual state-of-the-science and -action in PAC Rehabilitation quality-initiatives. As initially framed in our set of objectives, the draw of further “preliminary recommendations” should be made upon actual state of initiatives, complementing and enhancing its scope, as well as promoting a good fit and synergic action among the initiatives yet undertaken or being prepared in the field with what we will preliminarily recommend to advance the system of PAC Rehabilitation quality-initiatives. Therefore, knowing and being updated of quality-initiatives being

applied to the PAC Rehabilitation field was a critical starting-point for the task of drawing future-oriented “preliminary recommendations”.

Such 3<sup>rd</sup> review seems able to accomplish such supportive role. The review limitation that relates with scarce number of directly applied references (later addressed), paradoxically simplify the task of assuring, with a good degree of certainty, that major directly applied references were consulted and made reflected in the 3<sup>rd</sup> review results. Indeed, despite we also did not use a typical Cochrane-style systematic review, both the comprehensiveness of the previous reviews processes and the expert consultation made primarily for the 1<sup>st</sup> review (with Dale Strasser – the most active research in rehabilitation quality-initiatives, see Methods) leads us to the mentioned degree of certainty that the directly applied references were considered and not let out of scope by our review approach.

Despite reflecting the content of specific references (scarce number) addressing PAC Rehabilitation quality-initiatives, this 3<sup>rd</sup> review was mostly able to integrate information from quality-initiatives in general healthcare (2<sup>nd</sup> review) with quality challenges and concepts that are specific to PAC Rehabilitation (partly outlined in 1<sup>st</sup> review). It was most evident for the areas when specific PAC Rehabilitation literature regarding some stakeholders’ level was scarcer, such as the macro- and micro-system levels.

At the macro-system level, most of the features outlined in the 2<sup>nd</sup> review also apply to PAC Rehabilitation macro-systems, with an enhanced emphasis on the establishment of meso-systems and extended service-lines with PAC Rehabilitation services and care embedded within a continuum of services. At the micro-system level, we broadly applied the same sub-structure we at the equivalent level in the 2<sup>nd</sup> review, with the specific content outlined shaped by research, perspectives and references with origin in the 1<sup>st</sup> review.

## **1- Review limitations**

As outlined in Methods, this 3<sup>rd</sup> review had a different methodological scope. It was also the easiest review to methodologically accomplish in the frame of our set of specific goals. However, this context brings a different kind of discussing features and limitations.

First, we should note this 3<sup>rd</sup> review was the easiest to accomplish due the positioning after the 1<sup>st</sup> and 2<sup>nd</sup> review. Thus, it was partly built on major features, definitions and references yet collected or synthesized by the previous reviews. However, such feature stands in the origin of a limitation of this review. Indeed, such 3<sup>rd</sup> review cannot be fully separated from the process and results of the two previous reviews, neither it would be replicable in the same methodological way without performing those other reviews in first place.

In fact, what was easily accomplished with the other reviews already performed could be much more complex to achieve by directly addressing these matter, for instance being initiated by key-words search in major databases. This is because quality-initiatives are of many varied scopes, and applied references make use of a great array of different key-words, making such kind of triggering process complex and hardly accomplished.

Secondly, we should recall this review had a more restricted subject matter and more restrict number of directly applied references. While for one side it represents a comparative advantage regarding other reviews presented (facilitating access to all directly applied references, thus ensuring review representativeness of the literature), in fact we had much less direct empirical support regarding PAC Rehabilitation quality-initiatives, which represent the major limitation of such 3<sup>rd</sup> review, and broadly a major limitation of the PAC Rehabilitation research.

Therefore a major research pathway this review specifically uncovers is the need to address the scarce set of PAC Rehabilitation research directly evaluating and envisioning the effectiveness of PAC Rehabilitation quality-initiatives: 3<sup>rd</sup> translational-block to transform the healthcare quality<sup>(99)</sup>. Such research might provide an evidence-base around PAC Rehabilitation quality-initiatives in their ability to enhance PAC Rehabilitation quality of care.

With such regards, the effectiveness of external quality-initiatives might be studied and developed<sup>(12; 100)</sup>; as well as it might be studied and developed the PAC Rehabilitation specific context, or in other words the suitable improvement conditions<sup>(92)</sup>, particularly those that can facilitate the overcome of the PAC Rehabilitation perceived “quality paradox”<sup>(6)</sup>.

Without a system of effective and meaningful quality-initiatives (and specific research addressing the 3<sup>rd</sup> translational block), other PAC Rehabilitation research – such as those

*Discussion: Each Review Discussion*

opening the rehabilitation “black-box”<sup>(27; 28; 62)</sup> - hardly becomes wide-spread implemented into regular practice, responsive to users’ needs and preferences<sup>(99)</sup>.



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*Discussion: Each Review Discussion*

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