



Mapping of quality standards of health services in a Facility Management System for Colombian hospitals

Mapeo de estándares de calidad de servicios de salud en un Sistema de Facility Management para hospitales colombianos

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Abstract

The health service quality standards for Colombian health institutions entail obligations that must be aligned with the various management systems, including for support activities in the hospital environment. The authors of this work recognized the need to determine the impact of the quality standards of health services in the different phases of the continuous improvement cycles of a Facility Management System. In this work, it was carried out a documentary analysis and information treatment of national and international accreditations related to the stages of the high-level structure in a Facility Management System based on the ISO 41001 standard. The findings of this research have evidenced the compatibility and impact of the groups of standards of regulatory convergence in the different cycles of continuous improvement (operational, tactical, strategic, and transformational) in a Facility Management System for Colombian health institutions. Therefore, the authors of this work deduce that the regulatory correspondence in a Facility Management System can drive facility management services to achieve continuous improvement of the hospital infrastructure that guarantees the quality of health services and integration with other management systems.

Keywords: Standards, Management Systems, Facility Management, Hospitals, ISO 41001, ISO 41001

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Resumen

Los estándares de calidad del servicio de salud para las instituciones de salud colombianas conllevan obligaciones que deben estar alineadas a los diversos sistemas de gestión, incluso para las actividades de soporte del ámbito hospitalario. Los autores de este trabajo reconocieron la necesidad de determinar el impacto de los estándares de calidad de los servicios de salud en los diferentes criterios de los ciclos de mejora continua de un Sistema de *Facility Management*. En este trabajo se realizó un análisis documental y un tratamiento de información de credenciales nacionales e internacionales, que promueven la garantía de la calidad de los servicios de salud, relacionado con los criterios de la estructura de alto nivel en un Sistema de *Facility Management* basado en el estándar ISO 41001. Los hallazgos de esta investigación han evidenciado la compatibilidad y el impacto de los grupos de estándares de la convergencia regulatoria en los diferentes ciclos de mejora continua (operativo, táctico, estratégico y transformacional) en un Sistema de *Facility Management* para las instituciones de salud colombianas. Los autores de este trabajo deducen que la correspondencia regulatoria en un Sistema de *Facility Management* puede impulsar a los servicios de *Facility Management* a alcanzar una mejora continua de la infraestructura hospitalaria que garantice la calidad de los servicios de salud y la integración con otros sistemas de gestión.

Palabras clave: Estándares, Sistemas de Gestión, Facility Management, Hospitales, ISO 41001

Introduction

Many health institutions (HI) usually have some national or international accreditation that guarantees dedication and excellence in the health service, giving a signal to potential consumers of a comparable service (Smith, Martínez Álvarez & Chanda, 2011). The authors of this work identified, through a questionnaire, that the most used documents for ensuring the quality of the services of Colombian health institutions are three: the Unique Habilitation System and the Unique Accreditation System in Colombia, as well as The Joint Commission International worldwide. On the one hand, the Single Habilitation System (SUH, acronym in Spanish) is mandatory for any Colombian IS that wants to offer its services in the country, and, on the other hand, the Single Accreditation System (SUA, acronym in Spanish) is voluntary for those who wish to show their capacity. and quality in the provision of health services to stand out from the rest of IS. At an international level, the recognized voluntary accreditation of The Joint Commission International (JCI) has been identified, which ensures patient safety and the quality of health care regarding the services of health professionals; this accreditation is a prestigious international seal of hospital quality. Voluntary accreditations (SUA & JCI) have the following characteristics: they are vital to confirm the quality of care, they imply a high financial investment, a high demand for quality, expensive technology and infrastructure, highly qualified human resources, complex

process design, and complicated relationships with stakeholders (González-Mendoza & Fonseca-Vigoya, 2016).

These three accreditations (SUH, SUA and JCI) of health services are based on compliance with standards that are made up of "requirements that define operational expectations regarding structure, process and results that must be solidly in a adequate place in the organization to achieve safety and quality in patient care" (Medina Ruiz, Rosas Mosquera & Castro Bejarano, 2013). Therefore, the recognition and the objective of these quality accreditations are vital factors to achieve world-class characteristics in the evaluation of the quality of hospital care, considering the importance of health tourism in Colombia (González-Mendoza & Fonseca-Vigoya, 2016). Furthermore, this type of tourism has been part of government programs to promote new and emerging sectors in order to project them internationally through the development of sectoral business plans that promote economic growth and the strengthening of the national productive apparatus.

The best way to understand each of the accreditation systems in Colombia is to define them succinctly. The SUH establishes qualification standards as "the minimum and essential scientific and technological conditions applicable to any provider regardless of the service they offer" (Salazar Flórez, 2015; MinSalud, 2014; MinSalud, 2019). Likewise, the SUA promoted by the Ministry of Social Protection and the Colombian Institute of Technical Standards and Certification (ICONTEC) established a set of processes, procedures, and tools for voluntary and periodic implementation by auditors with the objective of continuous quality improvement. The HI that intends to be accredited in the SUA, previously authorized in the SUH, must pass verification by an accreditation body that carries out the analysis and makes the corresponding decisions to achieve it (MinSalud, 2002; MinSalud, 2014a; MinSalud, 2018; MinSalud, 2019). Finally, for this research, we considered exclusively the "management standards for healthcare organizations" of the JCI (2017), which are linked to support activities (also called non-core business) of the IS that appear in its accreditation manual. All the standards considered from the SUH, SUA & JCI documents for this research that make up the regulatory convergence are set out in table 1.

To comply with the requirements of regulatory convergence in an IPS, it is necessary to have effective management of the processes that support the main health activity, activities and support services is necessary. This is important to achieve better performance of the needs of the IS and its users; this regulatory convergence falls within the competencies of the Facility Management (FM) discipline. Several authors (Chotipanich, 2004; Price, 2004) consider that the support activities controlled by the FM of an organization are important since they imply a high impact for interested parties. Especially in the health sector, FM activities are associated with high operational risk of failure maintenance and high responsibility in financial management.

Table 1. Regulatory convergence composed of the SUH, SUA & JCI standards groups
(Source: Authors)

Sistema Único de Habilitación (SUH)	Sistema Único de Acreditación (SUA)	Health organization management standards (JCI)
Technical-Administrative Capacity (TAC)	Leadership (LEA)	Quality Improvement and Patient Safety (QPS)
Asset-Financial Capacity (AFC)	Management (MAN)	Prevention and Control of Infections (PCI)
Technological-Scientific Capacity (TSC)	Human Talent Management (HTM)	Government Body, Leadership and Management (GLD)
--	Physical Environment Management (PEM)	Facility Management and Security (FM&S)
--	Technology Management (TM)	Staff Qualification and Education (SQE)
--	Information Management (IM)	Management of Information (MOI)
--	Quality Management (QI)	--

The problem identified in this work was the lack of studies that relate the quality standards of health services with the activities and support services that reach the functions of the FM and, furthermore, with a standardized management system. For this reason, the analysis of the establishment of a FM-oriented management system (MS) in a Colombian IS has been considered relevant in this study, estimating the impact of the SUH, SUA & JCI standards groups on each of the clause. of a Facility Management System (FMS). Furthermore, it is appropriate to check the alignment of the FMS with a process-based approach through continuous improvement cycles as set out in the ISO 9001 standard (UNE, 2015); this type of cycle of continuous improvement allows problems to be solved in a structured way so that the organization benefits at all levels from continuous learning. Furthermore, the authors trust that the use of the ISO 41001 standard for establishing the FMS in the IS will provide the advantages outlined by Ballesty & Mitchell (2020): ensure that their FMS controls the risk, plan risk prevention, reduce non-toxic effects. desired, identify who will be responsible, carry out internal and external communication associated with risks, as well as consider opportunities for continuous improvement of controls that respond to external events.

Furthermore, the authors of this study considered that the publication of the ISO 41001 standard (UNE, 2018) on an FMS will allow achieving the appropriate combination between requirements, service levels, capabilities, constraints and costs of support activities and services. Therefore, the objective of this work has been to map the relationship of the different groups of regulatory convergence standards (SUH, SUA & JCI), of mandatory or voluntary compliance, in the different clauses of the high-level structure (HLS) of a FMS based on the ISO 41001 standard (Figure 1).

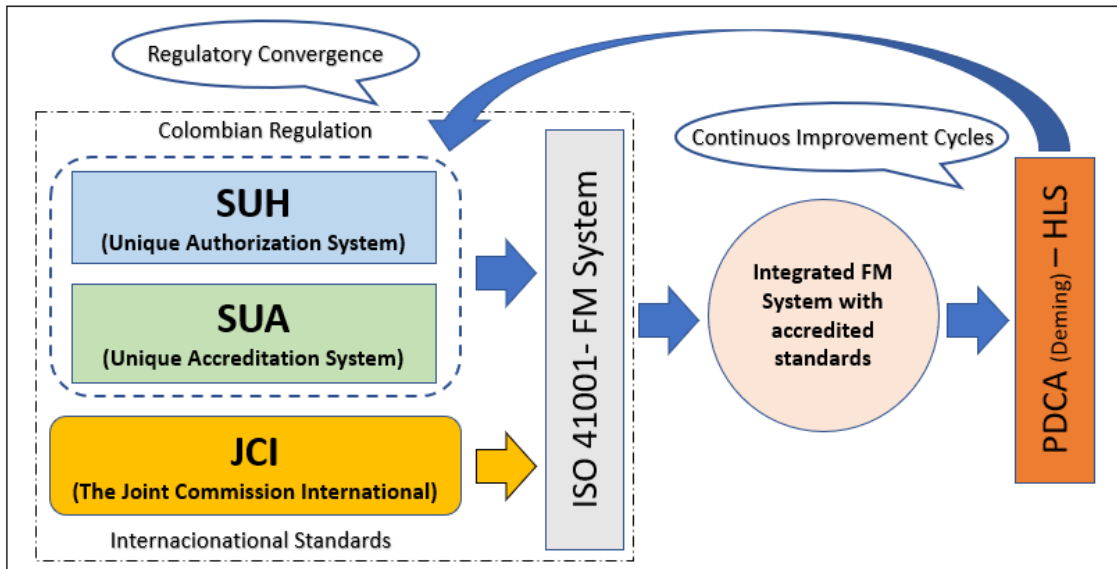


Figure 1. Model for inclusion of accreditation standards associated with an FMS of a HI.

This mapping aims to show the impact of each group of quality standards of health services at the different levels of management with a process-based approach for the establishment of an FMS in Colombian IS and the achievement of the different national and international accreditations of quality in the hospital environment.

According to the authors of this work, the HLS clauses of the FMS for HI are understood as follows:

The Context of the organization (C) includes the understanding of the organization and its context, the interpretation of the needs and expectations of the interested parties, and the determination of the scope of the FMS and the different cycles of continuous improvement or cycle PDCA (Plan, Do, Check and Act) in the organization.

Leadership (L) includes the demonstration of the commitment and leadership of top management (TM) to the FMS; the establishment by the TM of an FMS policy; and the assignment of roles, responsibilities, and authorities in the FMS by the TM.

Planning (P) integrates the purpose and requirements of FMS to address risks and opportunities, the establishment of FMS objectives in accordance with the requirements of interested parties, as well as the preservation of documented information on the objectives and planning of the FMS.

Support (S) involves the determination of the resources and competencies of FMS professionals, the identification of communication needs, policies, objectives, and effectiveness of FMS, and additionally, the determination of the management of the knowledge and information management of the FMS.

Operation (O) includes the planning, implementation, and control of the necessary processes of the FMS, the coordination of the organization with the interest groups and

the definition of the relationship of the users with the interest groups, and the definition of the integration of functions that guarantee the effectiveness and efficiency of the FMS.

Performance Evaluation (E) integrates the monitoring, analysis and evaluation of financial management services, the performance of planned internal audits of the FMS in accordance with the ISO 41001 standard as other management systems and the internal requirements of the FMS. Likewise, the review of the financial management system by the TM, communicating the results and the measures to be adopted.

Improvement (I) involves taking measures to control non-conformities and keeping a record of them, carrying out continuous improvement with the suitability, adequacy, and effectiveness of FMS, and establishing processes to identify deficiencies in services, performance, and evaluation of the FMS.

Materials and methods

The first step of this work was a systematic review of the selected literature using search tools and methods in databases on the SUH, SUA, JCI and ISO 41001. The records found underwent a documentary analysis and qualitative information treatment to identify regulatory convergence (Table 1) and the link of those standards associated with FM activities in the IH in an FMS, in this process an approach like another documentary research was used (Dulzaides Iglesias & Molina Gómez, 2004; Hernández & Tobón, 2016)

In a second step, related concepts of the three health quality accreditation documents (SUH, SUA & JCI) with the FM are identified through the detailed study of each of the 190 requirements set out in the 16 groups of standards. In addition, a relationship of each of the 190 requirements with each of the 7 clauses on the HLS in the FMS linked to the different cycles of continuous improvement of this MS was identified.

In a third step, a matrix was developed to visualize the relationship of the standards with the clauses on the HLS in the FMS. This relationship was assigned with an X within the matrix and each group of standards obtained a sum of all assignments (X). The sums with the two highest results (in bold) from each of the 16 groups of standards indicated the greatest impact on each clause on the HLS in the FMS. Example: If the XXX standards group had the greatest sum in L, S, E, say that the requirements of the XXX standards group had the greatest relationship with the following clauses: Leadership, Support and Evaluation of the FMS's performance.

In a fourth step, a model was developed that is represented in a figure to conceptualize the relationship of each of the most representative groups of standards in the 7 clauses on the HLS in the FMS. This figure allowed us to visually represent the impact of the 16 groups of standards on the different levels of business management and the influence of the requirements of health quality accreditations on the different PDCA cycles of the FMS for Colombian IH.

Results

The document analysis and treatment (SUH, SUA, JCI and ISO 41001) allowed the authors of this work to have a vision of the individual impact of the 190 standards linked to FM activities of regulatory convergence (Figure 1) in each of the FMS clauses for Colombian IH.

The individual impact of the 13 groups of SUA & JCI standards is identified by the highest results of each sum, highlighted in bold, in the correlation matrices between the requirements of each group of standards in each of the 7 clauses on the HLS in the FMS, as can be seen in table 2 and table 3. In the case of table 2, it can be seen the impact of the JCI standards groups on the FMS, through the summations (in bold of the blue zones) of the individual assignments of the 6 groups of standards of this accreditation.

Table 2. Impact of JCI standards on the HLS clauses of the FMS based on the ISO 41001 standard

(Source: Authors)

(JCI)	Clauses of the Facility Management System							
	QPS	C	L	P	S	O	E	I
No. 1								x
No. 2							x	x
No. 3					x			
No. 4							x	x
No. 5							x	x
No. 6							x	
No. 7						x		
No. 8							x	
No. 9						x	x	
No. 10								x
No. 11				x			x	
SUM	0	0	1	1	2	7	5	
(SQA)	C	L	P	S	O	E	I	
No. 1		x		x				
No. 2		x		x				
No. 3				x				
No. 4				x				
No. 5				x				

No. 6		x			x			
No. 7		x						
No. 8					x			x
No. 9		x				x		
No. 10		x						
No. 11		x				x		
No. 12		x				x		
No. 13		x					x	
No. 14		x					x	x
No. 15		x					x	
No. 16		x					x	x
SUM	0	12	0	7	3	4	3	
PCI	C	L	P	S	O	E	I	
No. 1		x			x	x		
No. 2				x	x			
No. 3				x		x		x
No. 4		x			x			
No. 5				x		x	x	
No. 6				x			x	
No. 7				x		x	x	
No. 8				x		x		
No. 9						x		
No. 10						x		x
No. 11		x			x			
SUM	0	3	6	4	7	3	2	
FMS	C	L	P	S	O	E	I	
No. 1		x						
No. 2	x			x				
No. 3					x	x		
No. 4					x	x	x	x
No. 5					x	x		
No. 6				x		x		

No. 7			x		x		
No. 8			x	x	x	x	
No. 9			x	x	x	x	
No. 10			x	x	x	x	
No. 11		x	x	x			
SUM	1	2	7	7	8	4	1
MOI	C	L	P	S	O	E	I
No. 1				x	x		
No. 2		x					
No. 3		x					
No. 4		x		x			
No. 5	x						
No. 6				x		x	x
No. 7		x		x			
No. 8				x			
No. 9		x		x	x		
No. 10				x			
No. 11				x			
No. 12				x		x	x
SUM	1	5	0	9	2	2	2
GLD	C	L	P	S	O	E	I
No. 1	x	x					
No. 2		x					
No. 3	x	x					
No. 4		x		x		x	x
No. 5		x			x	x	x
No. 6		x		x	x	x	x
No. 7		x		x	x		x
No. 8		x					
No. 9		x					
No. 10		x	x		x		
No. 11		x		x		x	x

No. 12	x			x			
No. 13	x					x	x
No. 14				x			
No. 15	x						
No. 16	x						
No. 17	x						
No. 18	x						
No. 19	x						
SUM	6	14	1	6	5	5	5

On the other hand, in table 3 it can be seen the impact of the groups of standards of the SUA on the FMS, through the sums (in bold green areas) of the individual assignments of the 7 groups of standards of this accreditation.

Table 3. Impact of the SUA standards on the HLS clauses of the FMS based on the ISO 41001 standard. (Source: Authors).

(SUA)	Criterios del Sistema Facility Management						
LEA	C	L	P	S	O	E	I
No. 76	x	x					
No. 77	x		x			x	
No. 78	x						
No. 79		x	x		x		x
No. 80		x				x	x
No. 81	x	x					
No. 82			x				
No. 83						x	
No. 84				x			
No. 85				x			
No. 86		x					
No. 87		x					
No. 88							x
SUM	4	6	4	2	2	2	1

MAN	C	L	P	S	O	E	I
No. 89			x				
No. 90		x				x	
No. 91	x	x					
No. 92		x	x				
No. 93		x				x	
No. 94		x		x		x	x
No. 95			x				
No. 96		x	x		x	x	
No. 97		x			x		
No. 98		x	x				
No. 99				x			
No. 100			x	x			
No. 101		x	x		x		
No. 102				x			
No. 103							x
SUM	1	9	7	4	3	4	2
HTM	C	L	P	S	O	E	I
No. 104	x	x					
No. 105				x			
No. 106		x		x			
No. 107		x	x				
No. 108		x	x		x		
No. 109				x		x	
No. 110			x	x		x	
No. 111						x	
No. 112					x		
No. 113	x	x		x			
No. 114				x			
No. 115				x			

No. 116			x			x	x
No. 117			x	x		x	
No. 118			x			x	x
No. 119				x			
No. 120	x	x				x	
SUM	3	6	6	9	3	7	2
PEM	C	L	P	S	O	E	I
No. 121	x	x		x			
No. 122			x	x	x		
No. 123						x	x
No. 124			x	x	x		
No. 125						x	x
No. 126			x			x	x
No. 127			x			x	x
No. 128		x					
No. 129		x		x		x	
No. 130	x			x		x	x
No. 131							x
SUM	2	3	4	5	5	6	4
TM	C	L	P	S	O	E	I
No. 132				x	x		
No. 133		x		x	x		
No. 134				x	x		
No. 135		x		x	x		
No. 136			x		x	x	
No. 137		x		x	x		
No. 138	x	x	x	x		x	
No. 139	x		x	x		x	
No. 140				x		x	
No. 141							x

SUM	2	4	3	8	6	4	1
IM	C	L	P	S	O	E	I
No. 142	x					x	
No. 143						x	
No. 144				x		x	x
No. 145				x			
No. 146			x	x	x		
No. 147			x	x	x		
No. 148				x	x		
No. 149			x	x	x		
No. 150				x			
No. 151			x		x	x	
No. 152				x	x	x	
No. 153				x	x	x	
No. 154				x	x	x	
No. 155							x
SUM	1	0	4	10	10	5	2
QI	C	L	P	S	O	E	I
No. 156			x		x		x
No. 157			x		x		x
No. 158					x	x	x
No. 157					x		x
No. 159			x				x
RESUME	0	0	3	1	4	1	5
N							

In the results of the previous tables, it can be seen the impact of each group of standards on the HLS clauses of a FMS. This is understood as the linking of the individual requirements of the standards to a criterion of different PDCA cycles. These results can be explained with the following example from table 3: the SUA Leadership (LEA) standards group impacts the following FMS clauses: Context of the organization, Leadership and Planning; because they are the clauses with the highest score, displayed in bold in the green area. This means that the requirements of the LEA standards group

of the SUA have more influence on these three clauses of different PDCA cycles of the FMS, although to a lesser extent these requirements can influence the rest of the clauses of this FMS.

Finally, the authors identified in the documentary analysis and documentation treatment that the groups of standards in the SUH document have an impact only on the FMS criterion called "Organizational Context" (Figure 4). This is because the stipulations of this document, which are mandatory for Colombian IH, determine the minimum requirements for any HI that intends to offer its services in the country. These requirements are totally linked to the organizational environment with the most basic processes, whether they are main or support activities or services. However, the groups of standards in the SUH document may have a lesser impact on other FMS clauses related to the economic, technological, or administrative capacity of the IH. This work can be summarized in table 4 where the correlation of the 16 groups of standards in the 7 clauses on the HLS is observed in a FMS of the main quality accreditation systems of health services for Colombian IH.

Table 4. Evaluation matrix of the SUH, SUA & JCI standards groups on the HLS in a FMS.

Accreditations Standards Groups	Clauses of Facility Management System						
	C	L	P	S	O	E	I
THE JOINT COMMISSION INTERNATIONAL (JCI)							
QPS						x	x
PCI			x		x		
GLD	x	x		x			
FMS			x	x	x		
SQE		x		x			
MOI		x		x			
SISTEMA ÚNICO DE ACREDITACIÓN (SUA)							
LEA	x	x	x				
MAN		x	x				
HTM				x		x	
PEM				x	x	x	
TM				x	x		
IM				x	x	x	
QI					x		x

SISTEMA ÚNICO DE HABILITACIÓN (SUH)	
CTA	x
CPF	x
CTC	x

In the results presented, the authors were able to identify that the 16 groups of SUH, SUA & JCI standards can be adequately integrated into the HLS and impact different PDCA cycles of the FMS for Colombian IH (Figure 2). That is, the FM activities according to the 16 groups of standards of regulatory convergence (Figure 1) are compatible in a FMS based on the ISO 41001 standard. In addition, the authors interpreted that the relationship of the 16 groups of standards within Regulatory convergence is distributed almost uniformly in the 7 clauses on the HLS of the FMS for a Colombian IH (Figure 2).

Based on the analysis of the results, the authors observed that the SUH standards groups have exclusively impacted the "Organization Context" clauses, since the SUH document includes the conditions, requirements and minimum clauses requested to provide health services in Colombia. However, the impact of the SUA and JCI standards groups has been distributed in the different clauses of the HLS in the FMS in a more homogeneous way.

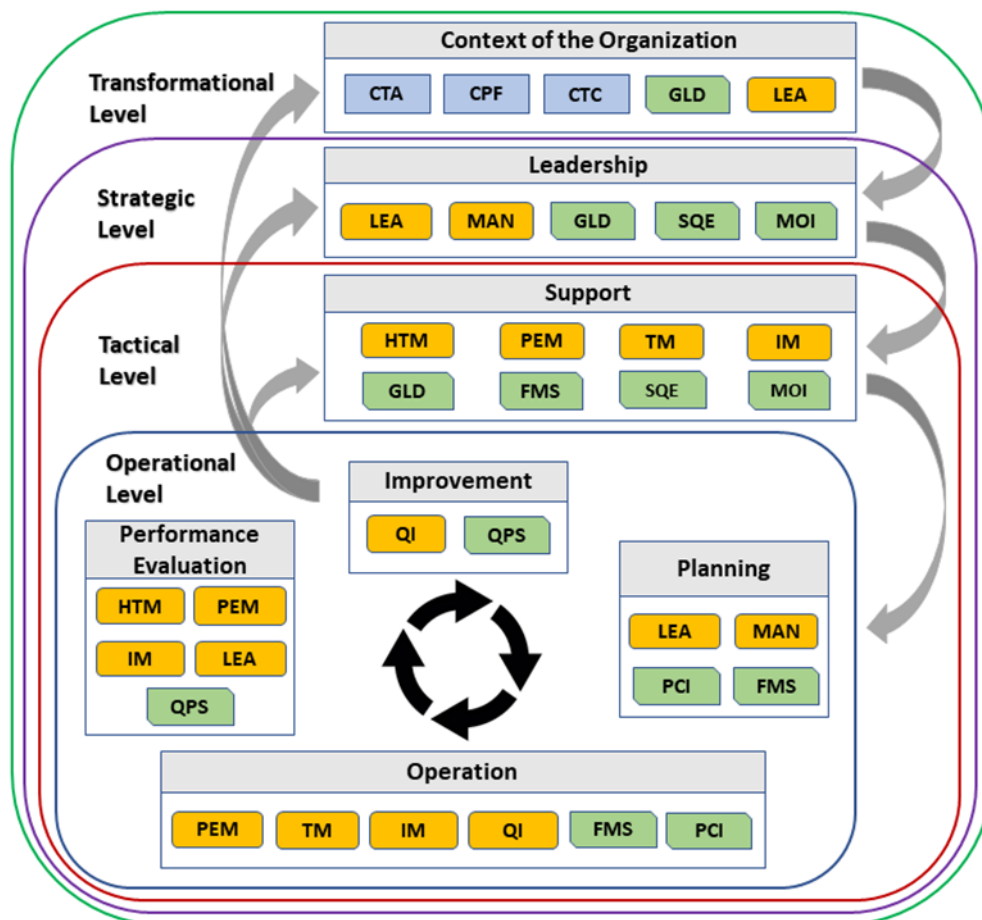


Figure 2. PDCA approach methodology based on the HLS of a FMS for Colombian HI.

According to Medina Ruiz et al. (2013), it can be indicated that these documents (SUA & JCI) have aspects in common. Since the main objective of these accreditations is continuous improvement and, therefore, they are usually associated with PDCA cycles for both services and processes of the MS (García, Quispe & Ráez, 2003). Thus, the FMS for a Colombian IH, in which the 16 groups of standards (SUH, SUA & JCI) are integrated, is composed of different PDCA cycles at the following levels of business management: transformational, strategic, tactical and operational (Figure 2).

Based on the ISO 41001 standard, the distribution of FMS, like a quality management system (García, et al., 2003), provides the common clauses of a PDCA cycle. This allows to develop and reformulate the necessary documents that support the main activity as well as the supporting activities in an IH. Figure 2 shows four different PDCA cycles established by a logical arrangement in an MS. At the operational level, short-term support activities are linked to the following FMS clauses: "Planning", "Operation", "Performance evaluation" and "Improvement". At a tactical level, the PDCA cycle grows, and the improvement reaches the "Support" clause of the HLS where information and human talent management activities are developed. At a strategic level, the PDCA cycle is extended, and the improvement reaches the "Leadership" clause of the HLS, involving strategic management activities. Finally, the PDCA cycle is expanded to a transformational level to achieve an improvement in the HLS "Organizational Context" clause. This level of management includes the main work of senior management related to policy development and business sophistication (Ford & Trucker (2014).

The authors of this work deduce that the establishment of an FMS based on the ISO 41001 standard can favor the following objectives for any Colombian HI: demonstrate the contribution of the efficiency and effectiveness of FM activities to organizational objectives, be coherent in the definition of the requirements and needs of the parties interested in the FM, being sustainable in a competitive environment, and organizing FM activities according to the clauses of the HLS of a FMS. However, it has been noted that the corresponding FM activities in each clause of the HLS and in each PDCA cycle presented in Figure 2 will be different for each of the Colombian HI. This is because the functions of the FM, their grouping and their distribution are not organized in the same way in any IH.

The ISO 41001 standard as a basis for SFM, from the point of view of Escorcía et al. (2018) for MS, encourages the use of adopted methods based on the PDCA approach to develop a regulation integration model. This establishes clear guidelines and drives objectives to promote and maintain continuous improvement in both core and supporting organizational processes. Therefore, the authors of this work understand that an FMS can: be integrated with the quality standards of health services to strengthen its results, reduce time, reduce human effort, and optimize both its technical and economic resources in HI, as proposed by López-Fresno (2010).

In any case, this work has been to show that the use of an FMS, based on the ISO 41001 standard, can be compatible with the achievement of the requirements linked to FM activities and different accreditations (SUH, SUA & JCI). The choice to aspire to non-mandatory accreditations for the quality of health services, whether national or international, will depend on each HI and the adaptation of the accreditations to the context and needs of each country. However, this work proposes a new line of research on the integration of the groups of standards linked to the FM of the regulatory convergence chosen through an FMS to take advantage of the advantages, mentioned by Ballesty & Mitchell (2020).

Conclusions

The authors of this work have analyzed the correlation of the regulatory convergence (Figure 1) of the three accreditations (SUH, SUA & JCI) for Colombian HI in each clause of the HLS of the FMS based on the ISO 41001 standard, and its impact on the different levels of business management (Figure 2), concluding the following findings:

- The requirements of the SUH standards groups aligned to FM activities mainly impact the "Context of the Organization" criterion and can generate an improvement at a transformational level for the HI.
- The requirements of the SUA standards groups aligned to FM activities impact almost all FMS clauses and can generate improvements at the four management levels presented but will be more significant at operational and tactical levels.
- The requirements of the JCI standards groups aligned to FM activities impact almost all FM clauses and, analogously to the SUA, can generate improvements in the four management levels presented, but will be more significant at tactical and strategic levels.

This shows that the joint use of the three accreditations (SUH, SUA and JCI) covers the entire spectrum of business management levels for a Colombian HI.

The benefits of this mapping, according to the authors of this work, are focused on the identification of the impact of the regulatory convergence standards groups (SUH, SUA & JCI), which are associated with FM activities, and this leads to relating these standards with the PDCA approach (continuous improvement cycles) for the development of an FMS in a Colombian HI. Furthermore, this study can lead to the development of a hospital infrastructure management model, in which not only the MS according to ISO are taken into consideration, but also the requirements of the health quality standards of regulatory convergence are considered: the requirements of the ISO 41001 standard, the macroprocesses of FM activities and the evidence of the FMS to form an integrated FM system.

The usefulness of the findings of this work could be, on the one hand, to carry out future consultations with experts on the detailed qualitative analysis of each of the standards to validate it in a more objective way. On the other hand, the development of future work focused on each of the continuous improvement cycles of the FMS with the groups

of standards corresponding to each accreditation. Finally, the determination of the competencies between the different departments associated with the fulfillment of the FM objectives and the requirements of the standards aligned with the organizational objectives in the HI within the FMS.

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