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Evidence on Hospital Accreditation to Leverage its Prospects for Improvement

The Case of Saudi Arabia

Dissertation
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on the authority of the Rector Magnificus,
Prof. dr. Pamela Habibović
in accordance with the decision of the Board of Deans,
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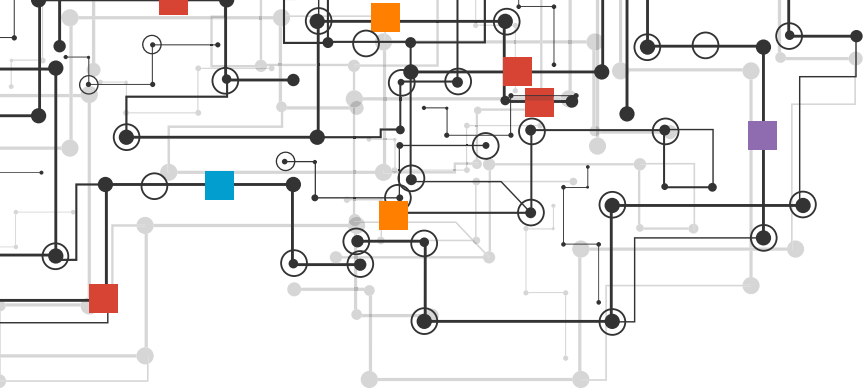
LIST OF ABBREVIATIONS

CBAHI	Saudi Central Board for Accreditation of Healthcare Institutions
CENTRAL	Cochrane central register of controlled trials
CDSR	Cochrane database of systematic reviews
CINAHL	Cumulative index to nursing and allied health literature
COREQ	Consolidated criteria for reporting qualitative research
DDKM	Danish healthcare quality program (in Danish: den danske kvalitetsmodel)
DEA	Data envelopment analysis
EFA	Exploratory factor analysis
HSE	Health systems evidence
I-CVI	Item-level content validity index
IOM	Institute of Medicine
ISO	International Organization for Standardization
ISQua	International Society for Quality in Health Care
JCAHO	The Joint Commission on Accreditation of Healthcare Organizations
JCIA	Joint commission international accreditation
IRR	Inter-rater reliability
MeSH	Medical subject SubHeading
NPT	Normalization process theory
PA	Parallel analysis
PICO	Population, intervention, comparison, outcomes
PRISMA	Preferred reporting items for systematic reviews and meta-analyses
RCT	Randomized clinical trial
RII	Relative importance index
RSCI	Russian science citation index
SSCI	Social sciences citation index



CHAPTER 1

GENERAL INTRODUCTION

1.1 SCOPE OF THE DISSERTATION

Internationally, countries take measures to sustain access to healthcare, improve healthcare quality, and control costs. The extent to which health services provided to individuals and populations increase the likelihood of improving desired health outcomes, is referred to as healthcare quality [1]. Care should be based on the most up-to-date clinical evidence and delivered in a technically and culturally competent manner, with open communication and shared decision-making [2]. Evaluating the quality of healthcare services is essential for performance improvements [3]. As a result, various approaches to evaluating healthcare quality have been developed and applied, either internally, from within the facility, or externally, through outside entities [4]. Accreditation is widely regarded as the most frequently used external evaluation tool for assessing the quality of healthcare services [5].

Accreditation is the process of independent assessment against recognized standards. The process is widely used in a variety of fields, including business education, schools, public relation, and healthcare. In healthcare, accreditation refers to the external assessment of a healthcare organization's compliance with pre-defined performance standards [6]. These standards ensure that healthcare organizations have structures, processes, and, to some extent, outcomes in place to enable service quality improvement. With the ultimate goal of improving healthcare quality [7], accreditation has become an important component of healthcare quality systems, widely accepted as a tool for performance improvement, and regarded as a reliable indicator of the quality of the entity that is accredited [8]. However, implementing accreditation as a stand-alone quality improvement solution may not guarantee results and may give stakeholders a skewed view of accreditation effectiveness in some contexts [9]. This may be attributed to the restricted perspective of accreditation programs and the fact that accreditation success affects and is being affected by other health legislations, licensing policies, and payment methods [10]. Hence, accreditation has been regarded as a tool that supplements other quality improvement strategies aimed at improving healthcare services [11].

In healthcare, the accreditation spectrum can apply to an entire healthcare facility (e.g. hospital or primary healthcare), a particular specialty (e.g. cardiac or oncology), or even a sub-specialty or disease (e.g. acute coronary syndrome or stroke) [12]. This dissertation focuses on hospital accreditation for a variety of reasons, including its large scope, conflicting findings on its impact, and the expenditure

required to comply with its standards. Therefore, this dissertation attempts to understand the impact of hospital accreditation programs, what factors affect the implementation of accreditation standards, and how healthcare leaders perceive the implementation of accreditation standards. Although the lessons gleaned from this dissertation apply to various accreditation programs and significantly contribute to the accreditation literature in broader contexts, the dissertation focuses on the hospital accreditation program in Saudi Arabia as an example of a relatively mature accreditation model. The dissertation is expected to assist and guide stakeholders to understand the mechanisms of integrating accreditation standards, make informed decisions about the accreditation pathway, and draw a road map for how accreditation should appear in the future.

1.2 A BRIEF OVERVIEW OF INTERNATIONAL ACCREDITATION MODELS

The American College of Surgeons planted the seeds of accreditation over a century ago [13]. Since then, accreditation programs have attained a prominent position among quality improvement strategies [14]. Over the last two decades, many countries, including high-, middle- and low-income countries, have adopted accreditation systems [9].

Typically, accreditation has been promoted as a voluntary program managed by non-governmental organizations, in which healthcare organizations have self-decided their willingness to be enrolled in such programs and adhere to the corresponding accreditation standards [11]. Currently, however, more than half of the accreditation programs have been developed and tailored on a national level and are overseen by both governmental and non-governmental organizations, using a variety of modalities in either voluntary or mandatory approaches [9]. For instance, countries such as Canada, Brazil, and Egypt are using voluntary accreditation, whereas Indonesia, New Zealand, and Saudi Arabia have adopted the mandatory approach to accreditation. Indeed, both voluntary and mandatory approaches present benefits and drawbacks that need to be carefully considered. The mandatory approach of accreditation helps in standardizing practices across a large number of health organizations, enhances public confidence in the health system, acknowledges the higher level of quality officially, improves the strategic resource allocation using performance data extracted from accreditation reports,

and avoids categorizing the quality of care within optional decisions [15]. On the contrary, it adds an inspection flavor to the process, which confuses the distinction between accreditation and licensing. Also, it leads to certain workarounds due to increased stress on healthcare workers, restricts the discretion of selecting other quality improvement methods, and increases the likelihood of superficial implementation of accreditation standards [16].

The international society for quality in health care (ISQua) is the organization that accredits accreditation programs. It offers a means of external evaluation and setting standards in line with the best evidence and practices. For over 30 years now, ISQua has strived to internationalize and standardize the fundamental pillars of accreditation programs via sets of defined standards [17]. Despite the fact that around 96 countries use accreditation as a performance improvement model today (see Table 1.1), standardization is still a goal that has not been met as a variety of policies and issues remain divergent [9]. Overall, accreditation programs preserve their standing as a strategy used by many countries to enhance the quality of healthcare organizations or services.

Table 1.1 Summary of regions with external evaluation programs, including accreditation programs and country details. *Adopted with permission from* [9]

Criteria	Region, program and country details, as on September 2019					
Region	**Europe**	**Middle East**	**Africa**	**South East Asia/Asia/Oceania**	**Americas**	**Total**
Programs—Agencies in Countries (underlined)	11	1	1	8	4	**25**
Countries with mandatory programs (bolded)	2	2	0	5	3	**12**
Number of countries	28	11	23	15	19	**96**
Country classification	HIC: 22 UMIC: 6 LMIC: 0 LIC: 0	HIC: 7 UMIC: 3 LMIC: 1 LIC: 0	HIC: 0 UMIC: 5 LMIC: 7 LIC: 11	HIC: 7 UMIC: 4 LMIC: 4 LIC: 0	HIC: 8 UMIC: 9 LMIC: 1 LIC: 1	**HIC: 44** **UMIC: 27** **LMIC: 13** **LIC: 12**
Country + Classification	Belgium—HIC Bosna Hercegovina —UMIC Bulgaria—UMIC Croatia—HIC Cyprus—HIC Denmark—HIC Finland—HIC France—HIC Germany—HIC Greece—HIC Hungary—HIC Italy—HIC Kazakhstan—UMIC Lithuania—HIC Monaco—HIC Netherlands—HIC Poland—HIC **Portugal**—HIC **Republic of Ireland**—HIC Romania—HIC Russia—UMIC Serbia—UMIC Slovenia—HIC Slovenia—HIC Spain—HIC Switzerland—HIC Turkey—UMIC UK—HIC	Bahrain—HIC Egypt—LMIC Iran—UMIC Israel—HIC **Jordan**—UMIC Kuwait—HIC Lebanon—UMIC Oman—HIC Qatar—HIC Saudi Arabia—HIC **United Arab Emirates**—HIC	Algeria—LMIC Botswana—UMIC Botswana—UMIC Burundi—LIC Democratic Republic of Congo—LIC Ethiopia—LIC Ghana—LMIC Ivory Coast—UMIC Kenya—LIC Lesotho—LMIC Liberia—LIC Malawi—LIC Mozambique—LIC Namibia—UMIC Nigeria—LMIC Rwanda—LIC Sierra Leone—LIC South Africa—UMIC Tanzania—LMIC The Gambia—LIC Tunisia—LMIC Uganda—LIC Zambia—LMIC	**Australia**—HIC China—UMIC Hong Kong, SAR China—HIC India—LMIC **Indonesia**—UMIC Japan—HIC Korea—HIC Macau SAR, China—HIC **Malaysia**—UMIC **New Zealand**—HIC Philippines—LMIC Sri Lanka—LMIC **Taiwan,** Republic of China—HIC Thailand—UMIC Vietnam—LMIC	Andorra—HIC Argentina—UMIC Barbados—HIC Bermuda—HIC **Bolivia—LMIC** Brazil—UMIC Canada—HIC Columbia—UMIC Costa Rica—UMIC **Ecuador—UMIC** Haiti—LIC Mexico—UMIC Panama—HIC Paraguay—UMIC Peru—UMIC Saint Lucia—UMIC Turks and Caicos Island—HIC **USA—HIC** Uruguay—HIC	

LIC, low-income country; LMIC, lower middle-income country; UMIC, upper middle-income country; HIC, high-income country.

1.3 THE VALUE OF ACCREDITATION

On a wider scale, accreditation programs are thought to play an important driving role in improving healthcare processes and outcomes [18]. These promising values have prompted several leading international healthcare organizations to positively argue for the effectiveness of accreditation as a performance improvement tool [19, 20] and its role in bridging the know-do gap [21]. In addition, they view accreditation as a marker of quality in front of patients, the community, and healthcare workers. However, this role is not undisputed.

The contradictory findings on the impact of accreditation have led to inconsistency in the conclusions of systematic reviews of the evidence on this topic [8, 12, 18, 22]. Several studies have found positive impacts of hospital accreditation on the care delivery process [23], patient safety culture [24], and organizational performance [25]. Contrarily, other studies reported insufficient evidence regarding the impact of accreditation on health outcomes [26] and patient satisfaction [27]. In addition, some studies have shown mixed results, with accreditation having a positive influence on specific aspects of healthcare, more so than others. For instance, one study reported that accreditation fostered change and professional development, while did not significantly improve quality measures and public disclosure [28]. Similarly, healthcare professionals expressed a degree of reservation about accreditation processes. Some professionals criticize accreditation for being disruptive to patient care, time-consuming, expensive, and bureaucratic [29, 30], while others applaud it for promoting organizational performance [31].

Overall, the literature presents a complex picture of the impact of accreditation. While some studies have emphasized the fact that repeated cycles of accreditation can result in improved healthcare performance [32-34], the question of whether accreditation values are sustainable and cost-effective remains debatable [35, 36]. This mixed view may be, in part, due to the contextual heterogeneity of accreditation policies and schemes [37], the scarcity of compelling causal studies on its value, the difficulty of isolating the effect of accreditation from other interventions affecting the quality of service, and the substantial expenditures required to meet accreditation standards [25, 38]. Because accreditation is viewed as a complex health intervention, interpreting the impact of accreditation differently in various contexts and settings is another factor that complicates the examination of accreditation effects [39].

It is important to note that although accreditation and certification terms are used interchangeably in some circumstances, we purposefully restrict the quest in our dissertation to accreditation due to several distinctions. Accreditation standards are based on best practices, patient-centered, and have more technical character [40], whereas International Organization for Standardization (ISO) standards are more process-oriented [36], lack health-specific criteria [41], and are focused on risk prediction [42]. Despite the undoubted advantages of certifications, accreditation programs are more efficient [43], easier to interpret in the health industry [44], and have more effect than ISO certification on hospital management, patient safety, clinical practice [37], outcomes [45], and business performance [46]. Therefore, this dissertation focuses on accreditation rather than certification.

1.4 HOSPITAL ACCREDITATION IN SAUDI ARABIA

Saudi Arabia is the largest country in the Middle East, divided geographically into 13 regions. The healthcare system consists of public and private health providers delivering primary, secondary, and tertiary care. Although the Ministry of Health, which provides free-of-charge health services to all citizens, is the major player in this system, the private sector takes a substantial role. Over 450 hospitals are operating today in the Saudi health matrix. Private for-profit facilities constitute around 30% which represents 25% of all hospital beds [47]. The health system nowadays is witnessing a radical reform of transformation toward a patient-centric value-based healthcare system to improve health, healthcare, and value [48].

In parallel with other quality management strategies, Saudi Arabia has adopted an accreditation scheme to enhance the quality of hospital services [49]. The Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) is the authorized body for setting standards, evaluating all operating healthcare facilities, and granting accreditation according to the level of compliance. Since its inception in 2005, CBAHI has strived to support healthcare facilities through continuous compliance with quality and patient safety standards. The hospital accreditation program offered by CBAHI has been made a mandatory program for all hospitals operating today in Saudi Arabia as per the Cabinet of Ministers Decree in 2013 [50].

The accreditation pathway in CBAHI is well-defined based on ISQua standards. In 2015, CBAHI published the third edition of the national culturally tailored accreditation standards for hospitals which consists of several standards addressing healthcare structure, process, and to some extent, the outcome. These standards are grouped into different chapters, where each chapter focuses on a particular process or service in the hospital operations, such as infection prevention and control, medication management, burn care, and respiratory care. Following an onsite survey, hospitals are either granted an accreditation certificate valid for three years or denied accreditation based on their performance against the standards using pre-established criteria [51].

1.5 ACCREDITATION CHALLENGES: INTERNATIONALLY AND IN SAUDI ARABIA

Using accreditation models to improve healthcare system performance necessitates ratifying, implementing, and adhering to accreditation standards [52]. Nonetheless, the implementation process is influenced positively and negatively by various financial and non-financial factors, both within and outside the healthcare system [19]. The heterogeneity of accreditation schemes has had an impact on the factors influencing standards implementation. These factors either promote or hinder the incorporation of accreditation standards into daily routine work. Identifying these factors is critical for assisting policymakers, accreditors, and other stakeholders in making informed decisions during the accreditation journey [21], especially when it comes to controlling challenging factors.

Although accreditation programs face nearly similar challenges in terms of accreditation policies, standards development, evaluation processes, and the survey team [9], some challenges reported in one context may serve as a motivator in another. For instance, cultural constraints were reported as a challenge in low- and middle-income countries [53-55], while a driver in other countries [56]. These challenges, combined with a lack of quantifiable evidence on the impact of accreditation, cast doubt on the value of accreditation programs and their long-term viability [57, 58]. It is worth noting that in some cases, these challenges were decisive in the decision to discontinue accreditation [30, 59].

In Saudi Arabia, despite the mandatory nature of the hospital accreditation program, many hospitals failed to comply with the accreditation requirements and were eventually denied accreditation [60]. This is attributed to various critical challenges and obstacles that Saudi hospitals encountered throughout the process of implementing accreditation standards. In a mixed-method study that investigated the challenges affecting national hospital accreditation, Almasabi *et al.* reported that resistance to change, limited accreditation literacy, lack of staff engagement, and insufficient training were the main challenges identified [61]. However, the study findings were limited to only three Saudi general hospitals accredited by CBAHI.

Along with the challenges, there are driving factors that positively influence the accreditation journey in Saudi Arabian hospitals. These drivers mitigate the detrimental effect of the aforementioned constraints. However, there is limited evidence available on these factors and the balance between them in the Saudi context. Exploring these factors assists stakeholders in assessing accreditation readiness, prioritizing accreditation efforts, and making informed decisions regarding the integration of accreditation standards in daily operations. In the same vein, the integration of accreditation standards is influenced by the degree to which hospital leaders are involved in the process [62, 63]. Yet, there have been no studies conducted to address the attitudes of hospital leaders toward national hospital accreditation in the Saudi context. Examining these attitudes provides a better understanding of the standards integration mechanisms and assists in adjusting the accreditation design based on the Saudi Arabian hospital's needs.

Furthermore, the challenges associated with hospital accreditation in Saudi Arabia call into question the sustainability of the program. Both, internationally and in the Saudi context, the roadmap of enhancing accreditation sustainability while weakening these challenges is an area of concern. Several speculative recommendations were proposed to improve accreditation sustainability. However, the importance, impact, and priority of these recommendations have never been studied either internationally or in the Saudi context. Testing the importance of these recommendations provides insight into the improvements and changes required to redesign the current hospital accreditation model. Also, it offers a clear map of how accreditation should appear in the future.

1.6 CENTRAL AIM AND OBJECTIVES OF THE DISSERTATION

Given the research gap outlined above, the central aim of the dissertation is to understand hospital accreditation in Saudi Arabia in order to leverage its prospects for improvement. The four main objectives of the dissertation are outlined below:

Objective 1

To comprehensively investigate the impact of hospital accreditation on the quality of healthcare services and health outcomes. Despite the positive popular belief in accreditation value, the literature reveals a complex and contradictory picture of its impact on the quality of healthcare services. This conflicting view raised the unanswered question of whether the value of accreditation justifies the effort required to implement their standards. Previously published reviews have presented inconsistent findings on the impact of accreditation [8, 12, 23, 64, 65]. These inconsistencies are caused by the insufficient number of controlled studies, contradictory findings, variabilities between accreditation programs, and differences in the designs of conducted reviews. For instance, some reviews considered the impact of specialty or disease-specific accreditation programs, which does not accurately reflect the overall impact of hospital accreditation [23, 64]. Others, on the other hand, overlooked some relevant studies, limited their search terms, or searched only for studies published in English, which limits their contribution to the accreditation literature [65]. Therefore, this dissertation comprehensively reviews the literature on hospital accreditation during the last two decades to understand the impact of hospital accreditation on the quality of healthcare services and health outcomes.

Objective 2

To explore the attitude of hospital directors toward Saudi Arabia's national accreditation program and toward the processes through which accreditation standards are incorporated within hospitals. The extent to which hospital accreditation has resulted in improving healthcare outcomes is influenced by the degree to which accreditation standards have been translated into actions and routinized in daily operations. This stage is usually preceded by getting acquainted with accreditation standards and appreciate the value of adopting them. Hence, the perception of stakeholders towards the value of accreditation plays a crucial role in implementing accreditation standards. In the accreditation literature, the

perception of stakeholders on whether accreditation is effective presents a mixed view [11]. While some have criticized accreditation for being time-consuming, expensive, and bureaucratic [29, 30], others have praised its role in promoting performance, improving safety culture, and standardizing organizational processes [31, 66]. In fact, hospital leaders play a key role in pursuing accreditation [62, 63]. Therefore, examining how they perceive accreditation will offer a clear understanding of how accreditation would be implemented and how accreditation would be tailored to maximize the acceptance and engagement of stakeholders in the accreditation journey. In light of this, the dissertation explores the attitude of hospital directors toward Saudi Arabia's national accreditation program as well as the processes through which accreditation standards are incorporated into the hospital's routine operations.

Objective 3

To examine the perceived driving and restraining factors influencing the implementation of accreditation standards in Saudi Arabian hospitals (Figure 1.1, Stage 2). The process of integrating accreditation standards in a hospital setting involves changes in the current performance. In that, several practices are reframed to be aligned with the accreditation standards [52]. The long-term success of this change is heavily reliant on routinizing and normalizing the standards in daily work. This process is influenced by a variety of factors, from within and outside the hospital setting [19]. Previous studies have reported that structural, cultural, and operational factors all play a role in the implementation of accreditation standards [53-55]. However, because these factors are context-sensitive, leaders and frontline staff who are actively involved in this change process are better able to recognize what assisted in integrating accreditation standards and what hampered their efforts in the new evolving situation. Identifying these positive and negative factors, from their perspectives, is essential for assisting stakeholders in making informed decisions during the accreditation journey [21]. Accordingly, this dissertation examines the perceived driving and restraining factors influencing the implementation of accreditation standards in Saudi Arabian hospitals. It also presents a comprehensive visual map of these factors to illustrate the balance among them.

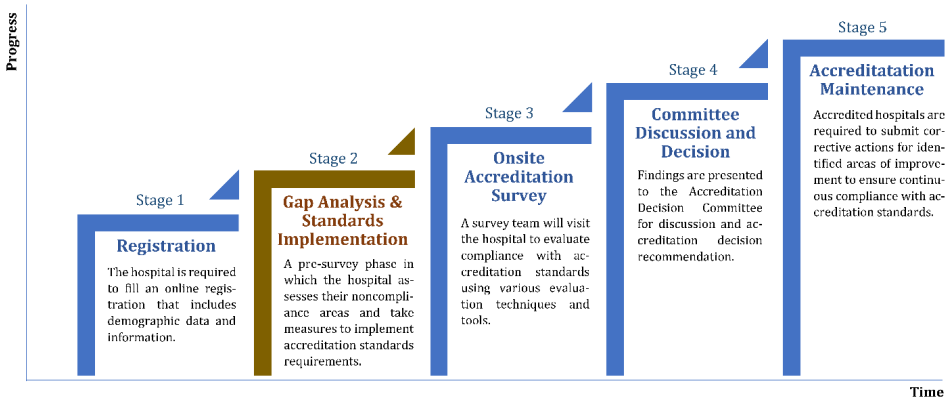


Figure 1.1: The key steps of the hospital accreditation pathway in Saudi Arabia [51].

Objective 4

To examine the improvements that are important to enhance the sustainability of the hospital accreditation model in Saudi Arabia. The sustainability of hospital accreditation programs has been questioned due to the challenges associated with the implementation of accreditation standards and the rapid changes occurring in the health industry in this digitalized era [57, 58]. This may have an impact on the future position of hospital accreditation programs. Therefore, accreditors strive to improve the current accreditation model to maintain its standing among other performance-improvement tools. However, existing literature on accreditation lacks a clear roadmap on how accreditation should appear in the future. Accreditation experts have proposed some actions to enhance the sustainability of these programs, such as incorporating artificial intelligence into accreditation evaluations, involving service providers in standard development, and considering consumer perspectives in accreditation decisions [9, 11, 17, 67]. Yet, the importance of these recommendations has not been tested. Testing that may assist in understanding how to redesign the current accreditation model to enhance its sustainability, acceptance, and agility. Therefore, this dissertation examines the improvements that are important to enhance the sustainability of the hospital accreditation model in Saudi Arabia as perceived by quality managers in Saudi hospitals.

The dissertation focuses on the hospital accreditation program in Saudi Arabia. However, the research questions that are being addressed in this dissertation and their implications are relevant to a wider scale of hospital accreditation, as well

as other accreditation programs, in broader contexts. The lessons gleaned in this dissertation offer a comprehensive view of the impact of accreditation, drivers that motivate the implementation of accreditation standards, challenges that could hinder the normalization of accreditation standards in daily work, and recommendations to consider in re-shaping the current accreditation model into a more sustainable version that maintains the evolving position of accreditation as a performance improvement tool. The findings in this dissertation would assist researchers, policymakers, accreditors, and other stakeholders with a better understanding of the hospital accreditation model, helping them make more informed decisions on using accreditation as a performance improvement tool and integrating accreditation with other health policies concerning the quality of healthcare services. Also, the findings would serve as a road map for introducing changes that could enhance the modernization and sustainability of accreditation models.

1.7 STRUCTURE OF THE DISSERTATION

This dissertation is divided into six chapters. After this first chapter, **Chapter 1**, the dissertation includes the four core chapters and a general discussion chapter, which are briefly described below.

Chapter 2 identifies and analyses the evidence on the effect of hospital accreditation on health outcomes and the quality of healthcare services. This chapter is based on a comprehensive systematic review of a wide range of electronic databases, including PubMed, PsycINFO, EMBASE, MEDLINE (OvidSP), ScienceDirect, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane Database of Systematic Reviews (CDSR), Cochrane Central Register of Controlled Trials (CENTRAL), and Web of Science, including Social Sciences Citation Index (SSCI), Russian Science Citation Index (RSCI), SciELO Citation Index, and KCI-Korean Journal Database. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, the review includes quantitative studies published over the previous two decades, irrespective of their design or language.

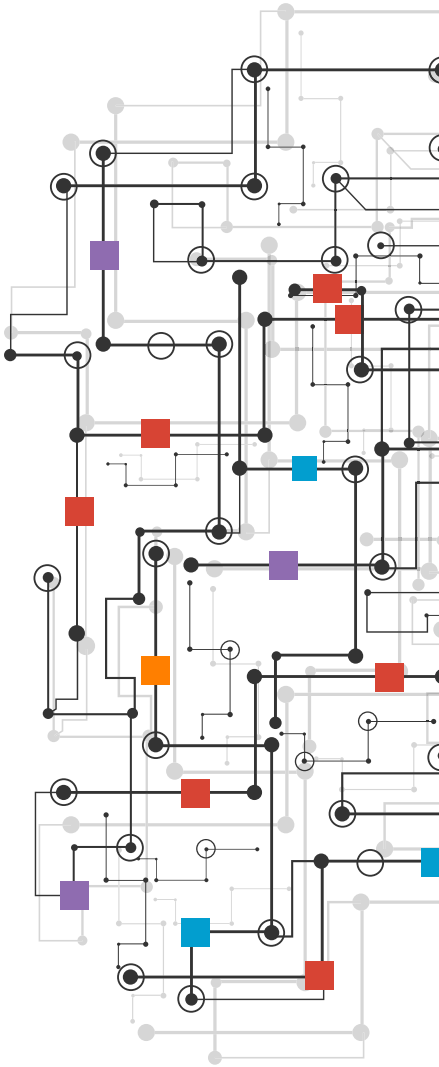
Chapter 3 rigorously explores the attitude of hospital directors towards accreditation and investigates the mechanisms of normalizing standards in Saudi Arabian hospitals. Qualitatively, the findings in this chapter are drawn based on semi-structured interviews with fifteen hospital directors across Saudi Arabia.

This chapter, using a theoretical framework, offers heuristic explanations for the mechanism of normalizing accreditation standards.

Chapter 4 investigates the perceived driving and restraining factors influencing the implementation of accreditation standards in Saudi Arabian hospitals. The findings in this chapter are also structured using semi-structured in-depth qualitative interviews with 27 hospital directors and 29 hospital quality directors. The force-field analysis framework is adopted in this chapter to describe the results by providing a comprehensive visual map to show the balance among the opposing factors influencing the implementation of hospital accreditation standards.

Chapter 5 examines what improvements hospital quality managers find important to enhance the sustainability of the hospital accreditation model in Saudi Arabia. The findings in this chapter are drawn quantitatively utilizing a cross-sectional questionnaire that was developed, tested, piloted, and factorially validated. On a 5-point Likert scale, respondents rated the importance of recommended changes that are proposed to enhance the sustainability of accreditation policies, standards development, evaluation methods, and the evaluation team.

Chapter 6 outlines the main findings of the dissertation and the new evidence arising from this dissertation. It also discusses the findings in a streamlined manner, supported by previous literature, with an emphasis on lessons learned, strengths, limitations, policy implications, and potential future study topics.



CHAPTER 2

THE IMPACT OF HOSPITAL ACCREDITATION ON THE QUALITY OF HEALTHCARE: A SYSTEMATIC LITERATURE REVIEW

This chapter draws upon:

Hussein M, Pavlova M, Ghalwash M, Groot W. The impact of hospital accreditation on the quality of healthcare: a systematic literature review. BMC Health Serv Res. 2021;21(1):1057.

ABSTRACT

Background. Accreditation is viewed as a reputable tool to evaluate and enhance the quality of healthcare. However, its effect on performance and outcomes remains unclear. This chapter aims to identify and analyze the evidence on the impact of hospital accreditation.

Methods. In this chapter, electronic databases (PubMed, CINAHL, PsycINFO, EMBASE, MEDLINE (OvidSP), CDSR, CENTRAL, ScienceDirect, SSCI, RSCI, SciELO, and KCI) and other sources were systematically searched using relevant subject headings. Peer-reviewed quantitative studies published over the last two decades were included, irrespective of their design or language. Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, two reviewers independently screened initially identified articles, reviewed the full-text of potentially relevant studies, extracted necessary data, and assessed the methodological quality of the included studies using a validated tool. The accreditation effects were synthesized and categorized thematically into six impact themes.

Results. A total of 17,830 studies were screened, of which 76 empirical studies that examined the impact of accreditation met the inclusion criteria of this review. These studies were methodologically heterogeneous. Apart from the effect of accreditation on healthcare workers and particularly on job stress, the results of this systematic review indicate a consistent positive effect of hospital accreditation on safety culture, process-related performance measures, efficiency, and the patient length of stay, whereas employee satisfaction, patient satisfaction and experience, and 30-day hospital readmission rate were found to be unrelated to accreditation. Contradictory results regarding the impact of accreditation on mortality rate and healthcare-associated infections hampered drawing firm conclusions on these outcome measures.

Conclusion. There is reasonable evidence to support the notion that compliance with accreditation standards has multiple plausible benefits in improving performance in the hospital setting. Despite inconclusive evidence on causality, introducing hospital accreditation schemes stimulates performance improvement and patient safety. Efforts to incentivize and modernize accreditation are recommended to move towards institutionalization and sustaining the performance gains.

2.1 BACKGROUND

"To Err is Human," a landmark report that was published by the Institute of Medicine (IOM) in 1999 [68], recommended reinforcement of quality and safety in healthcare [69]. The report suggested that quality is multifaceted and quality assessment is one of the driving forces to establish performance improvement [3, 70]. In response, various approaches have been employed globally to regulate healthcare quality internally and externally [4]. External review systems facilitate organizational change, enhance the quality of services, and strive toward quality standards [12]. Accreditation has been cited as the oldest and most common strategic external quality assessment tool in healthcare [5, 71]. In the last two decades, many countries have adopted or adapted hospital accreditation systems [28, 72].

As indicated in Chapter 1, accreditation refers to the external peer review that evaluates a healthcare organization's compliance against pre-defined performance standards [6], with the ultimate aim to improve healthcare quality [7]. It is overseen by various governmental and non-governmental entities, using different modalities in voluntary or mandatory approaches. The scope of accreditation can cover the entire healthcare facility or only a specialty or even a sub-specialty [12, 34]. Several leading international healthcare organizations have viewed accreditation as a valid marker of quality [8] and discussed the effectiveness of using accreditation standards as a tool to enhance organizational and clinical performance [37, 40, 73]. Nevertheless, the available evidence in the literature supporting this assumption remains scarce.

Despite the ostensible promising effect of healthcare accreditation [19, 20], the literature presents a complex view of its impact [22]. The legitimacy concerns about accreditation are due to the scant high-quality trials and conflicting reported results [25, 38, 74]. Contradictory findings have generated inconsistency in the conclusions of previously published reviews [8, 12, 18, 23-28, 35, 36, 64, 65, 75]. On the one hand, the positive impacts of hospital accreditation on organizational culture [8, 35, 64], clinical practice, organizational performance [25], clinical leadership, patient safety systems [24], quality of services [18], care delivery process [23], and efficiency [65] have been demonstrated. On the other hand, several reviews reported insufficient evidence of the impact of accreditation on measurable changes in quality of care [8], health outcomes [26], patient satisfaction [27], and economic outcomes [26, 28, 64]. For instance, Greenfield and Braithwaite

[28] present diverging findings on the impact of accreditation as the effect was limited to promoting change and professional development, while other impact categories, such as quality measures, financial impact, and public disclosure results, were inconclusive. In addition, some reviews questioned the cost-effectiveness of accreditation [12, 35, 36].

Previously published accreditation reviews included the impact of specialty [23] or disease-specific [64] accreditation programs which could dilute the overall impact of hospital accreditation, used stringent inclusion designs that could limit its contribution room [8, 12], restricted search languages, or overlooked several relevant studies [65]. This chapter aims to identify and analyze the evidence on the impact of hospital accreditation while overcoming hindrances in previous reviews.

2.2 METHODS

This chapter followed PRISMA guidelines [76]. It has been verified that there was no running or completed systematic review like the review presented in this chapter in Prospero and Health Systems Evidence (HSE) database at the commencing phase. Thereafter, the protocol of the systematic review was registered as PROSPERO ID: 167863 on 04-Feb-2020 to avert "HARKing" [77].

Databases and search terms

Electronic bibliographic databases were searched systematically to retrieve relevant publications using relevant subject headings and controlled vocabulary terms, as shown in Appendix A1. Databases include; PubMed, CINAHL, PsycINFO, EMBASE, MEDLINE (OvidSP), ScienceDirect, CDSR, CENTRAL, and Web of Science, including SSCI, RSCI, SciELO Citation Index, and KCI-Korean Journal Database. The search reported here was effectuated on 18 February 2020 after being reviewed by a specialist librarian.

Additionally, Google Scholar was searched using keywords in different combinations, including accreditation, hospital, quality, impact, and healthcare services. Furthermore, the websites of the most popular accreditation entities were scanned for additional papers that might be overlooked.

Screening and eligibility assessment

This systematic review included full-text publications that evaluated the impact of overall hospital accreditation programs on the quality of healthcare services in the last two decades (i.e. since "To Err Is Human") from January 2000 – February 2020. All quantitative studies were included, irrespective of their design. No language restriction was added. Following the search, titles and abstracts were retrieved and uploaded into the bibliographic reference management software EndNote X9, and deduplicated. Thereafter, two authors independently screened all titles and abstracts to identify potentially relevant articles and read the full text of relevant studies to assess eligibility. Studies were assessed for eligibility using the PICO criteria [78]: population— all types of hospitals; intervention— all types of overall accreditation; comparison— unaccredited hospitals, before-and-after, or different accreditation levels; outcomes— measurable impacts on the structure, process, or outcome parameters. At any stage, disagreement between the two authors was reunited by consensus or arbitration by a third author.

Unindexed studies, review articles, or studies published in an "abstract" format were excluded. Also, studies conducted in healthcare settings other than hospitals, studies that evaluated the impact of accreditation on a specialty or disease-specific, or examined accreditation preparation cost were excluded. In addition, studies that assessed the perceived benefits of accreditation have been excluded. However, to evaluate the impact from different perspectives, comparative studies that examined accreditation effects on self-reported subjective outcome parameters (e.g. patient satisfaction, job stress) using a validated instrument were included.

A kappa inter-rater reliability (IRR) test was conducted to assess full-text assessment reliability [79, 80]. A sample of 50 studies that were evaluated for inclusion by the two reviewers was randomly selected and matched. Four differences were identified, which resulted in kappa 0.81, indicating a high agreement level.

Data extraction

Studies that met the inclusion criteria were debriefed independently by two authors using a standardized data extraction form, and their references were screened (i.e. snowballing) for additional potentially relevant studies. Details on the research designs, goals, findings, and conclusions were extracted and compiled for analysis. Occasionally, when information insufficiency hindered data extraction, it was solicited from the corresponding author. All relevant non-English-language

studies were translated through Google Translate, which has been cited as a reliable tool for translating papers published in languages other than English in systematic reviews [81, 82]. However, for authenticity, an e-mail of the data extracted from the included non-English studies was sent to the corresponding author for verification and stipulated obtaining confirmation for inclusion. Studies that did not meet the inclusion requirements were summarized along with the reason for exclusion, and records were preserved for audit trail purposes.

Quality assessment

The methodological precision of included publications was assessed using Hawker *et al*. framework as it provides an appropriate unified scale for heterogeneous study designs [83]. The instrument consists of nine items (abstract and title, introduction and aims, method and data, sampling, data analysis, ethics and bias, findings, transferability, and implications and usefulness), each scored on a 4-point scale (1 = good; 2 = fair; 3 = poor; 4 = very poor). The overall grade was judged based on the average score of these items (1.00–1.49 = good, 1.50–2.49 = fair; 2.50–3.49 = poor; 3.50–4.00 = very poor) [84].

For each included study, the coders independently assessed the methodological quality, assigned an appropriate score, and calculated the overall grade accordingly. To test the assessment's credibility, a kappa IRR test was employed using 20 randomly selected assessed studies. A crosswalk between decisions revealed two disparities, resulting in kappa 0.8, which indicates a trustworthy agreement level [79, 80].

Analysis

For text mining [85], extracted data were synthesized and presented narratively using thematic analysis [86]. The effects were categorized into six impact themes that were reported in part or entirely in previous reviews [8, 12, 18, 26, 28, 35] and models [87]. In this review, the impact of accreditation was defined as a measurable marked effect that the accreditation process demonstrated, positively or negatively. The impact was judged to be positive if all or most of the results were significantly advantageous, negative if all or most of the results were unfavorable, or neutral when no real change due to accreditation was identified [26]. The impact themes were: changes in organizational culture and management; changes at the professionals level; changes at the patient level; changes in patient clinical outcomes; changes in performance measures; and changes in economic outcomes. Each study was classified under one or multiple outcome themes.

2.3 RESULTS

Search results

The review search identified 17,830 publications. Based on the title and abstract screening, 327 articles were deemed potentially eligible and retrieved for full-text review. Of these, 74 studies matched the inclusion criteria. This included seven non-English studies verified by their authors, while four other non-English studies were excluded due to no response to the verification request. Two additional studies were identified by screening the references of included articles, which yielded 76 studies for critical appraisal and analysis (Figure 2.1).

Features of the included studies

Appendix A2 summarizes the key findings of all studies included in this review. During the last decade, there has been a notable flourish in the number and spectrum of studies evaluating the impact of accreditation in the literature. Almost three-fourths (n = 52) of the included studies were published during the last five years (2015–2019). The majority of studies were in English (n = 69). The seven verified and analyzed non-English studies were published in Persian, Danish, Korean, and Hungarian.

Included studies were conducted in 22 countries representing all inhabited continents. The highest number of studies were from the USA (n = 11) and Brazil (n = 9). Two multinational studies were conducted in European hospitals [24, 37]. Studies evaluated the impact of 23 accreditation programs. The most studied accreditation program was the Joint Commission International Accreditation (JCIA) (n = 14). Twenty-one studies (28%) assessed the impact of accreditation in a single hospital, while the range was up to 4400 hospitals.

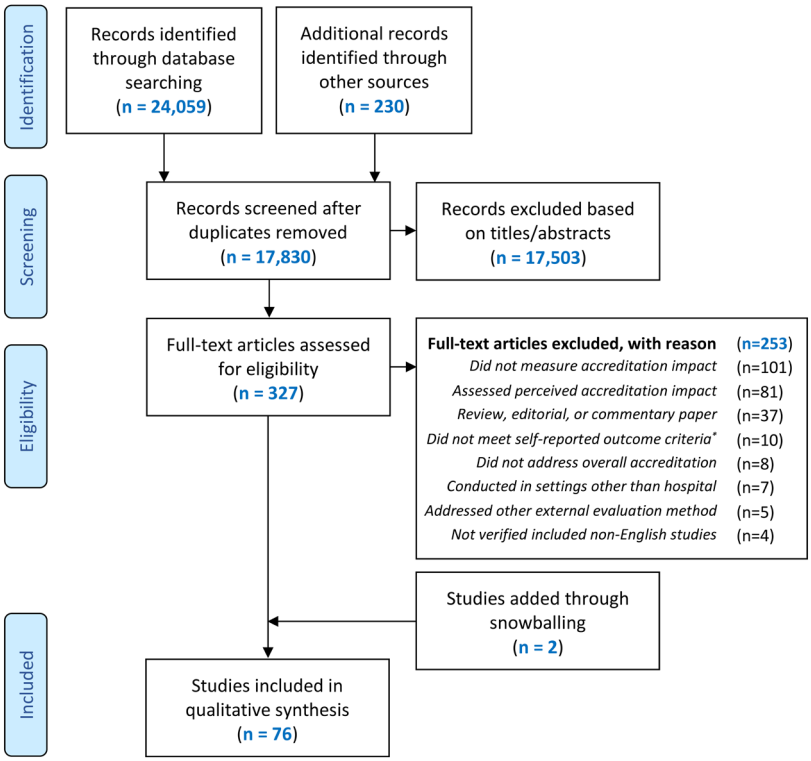


Figure 2.1 PRISMA flow diagram illustrating the review process.
** Self-reported subjective outcome parameter through a validated instrument, using comparative design*

Assessment of the methods used

In this review, many studies have a cross-sectional design (n = 29). A before-after design was utilized in 30 studies. Cohort and quasi-experimental designs were employed in 12 and 14 studies, respectively. Notably, only one randomized clinical trial (RCT) was found and included [88]. This level of evidence may indicate an association between accreditation and performance measures; however, causal inferences should be made with considerable caution. A meta-analysis was not possible with these observational designs and the modest methodological consistency.

The appraisal of the included studies showed that 32, 37, and 7 studies were of good, fair, and poor methodological quality, respectively. Studies with poor methodological quality have shown a positive [89-91] (n = 3) or neutral [61, 92-94] (n = 4) accreditation effect; albeit, their findings should be scrutinized with care. The narrative analysis in this review disregarded these studies to avoid

jeopardizing the conclusion. This seemed unlikely to alter the review findings.

The impact themes

Included papers were thematically clustered into six impact themes (Table 2.1). Two themes, namely "changes in patient clinical outcomes" and "changes in performance measures," captured more than 60% of included publications. Although the themes are collectively exhaustive, they are not mutually exclusive, as 16% (n = 12) of the studies examined the impact of accreditation on at least two measures in separate themes.

- ***Changes in organizational culture and management***

The impact of hospital accreditation on organizational culture and management was examined quantitively in five studies [95-99]. Several studies have examined the effect of hospital accreditation on safety culture through self-reported surveys. Most [95-97] but not all found a strong link between both [98]. Accreditation positively affects perceived patient safety culture [95], safety climate toward medication error reporting [96], and organizational culture as manifested by a less hierarchical culture and more group and developmental culture [97]. On the contrary, a recent study did not detect changes in the safety management culture from the nurses' perspective after accreditation [98].

- ***Changes at the professionals level***

This review identified ten studies that assessed the impact of accreditation on self-reported parameters such as job stress, job satisfaction, and work environment [89, 98, 100-107], five being before-after studies, while a comparative approach between accredited and non-accredited hospitals was used in the remaining. Authors found negative (n = 4) or no impact of accreditation (n = 4) at the healthcare professionals level, particularly for nurses who were the selected subjects in seven studies.

Studies reported a consistently negative impact of hospital accreditation on professionals' perceived job stress. For example, in four studies, accreditation was associated with higher job stress as perceived by health professionals [98, 100-102]. In addition to stress, Elkins *et al.* reported higher anxiety and depression among nurses during the accreditation preparation phase, as well as a significant improvement in job satisfaction and sleep function post-accreditation [102]. However, due to the limited research available, it remains uncertain if accreditation affects job satisfaction or the working environment.

Table 2.1 Methodological quality ratings and impact directions of included studies (n=76)

Themes	Definition and Examples	Related Studies Cited as per the Reference List	Methodological Quality			Impact Direction of Good & Fair Studies		
			Good	Fair	Poor	Positive	Negative	Neutral
Changes in organizational culture and management (n=5)	Demonstrated as a significant quantitative hospital managerial or cultural change (e.g. safety culture, communication)	**95-99**	1	4	0	4	0	1
Changes at the professionals' level (n=10)	Demonstrated as changes in professionals' self-reported outcome parameters (e.g. job stress, job satisfaction)	**89, 98, 100-107**	3	6	1	1	4	4
Changes at the patient level (n=14)	Demonstrated as a measurable change in self-reported subjective outcome parameters from a patient and user perspective (e.g. patient satisfaction, patient experience)	**20, 88, 92, 94, 108-117**	6	6	2	3	2	7
Changes in patient clinical outcomes (n=24)	Demonstrated as a statistically significant change in patient health outcome measures (e.g. mortality rate, length of stay)	**20, 33, 38, 61, 71, 90-92, 118-133**	8	12	4	15	0	5
Changes in the quality of services provided (n=28)	Demonstrated as a statistically significant change in clinical performance measures (e.g. hand hygiene compliance, medication utilization)	**24, 32, 37, 71, 73, 88, 91, 93, 99, 107, 118, 125, 128, 134-148**	14	12	2	18	0	8
Changes in economic outcomes (n=8)	Demonstrated as quantifiable changes in financial or economic outcome parameters (e.g. efficiency, profitability)	**43, 122, 128, 149-153**	4	4	0	5	1	2

- ***Changes at the patient level***

Only 14 studies that assessed the impact of hospital accreditation on measurable patient-reported outcome parameters were found [20, 88, 92, 94, 108-117]. Studies mainly used an observational cross-sectional design (n = 12).

Despite the widely held belief that accreditation contributes to improving patient satisfaction and experience, most findings provide little evidence to support whether accreditation status or ratings are measurably linked to patient satisfaction and experience in a meaningful way. Multiple studies that compared accredited with non-accredited hospitals [20, 88, 109, 110, 116, 117] or accredited hospitals at different accreditation levels [108, 111] did not find any association. For instance, Sack *et al.* did not find a link between accreditation and patients' perception of better quality, reflected by their recommendation rates of the institutions at the hospital level or the cardiology unit level [116, 117].

- ***Changes in patient clinical outcomes***

Interestingly, around one-third (n = 24) of the included studies examined the impact of hospital accreditation on patient outcomes [20, 33, 38, 61, 71, 90, 91, 92, 118-133]. Of these, 75% have been published since 2015 as an obvious response to previous appeals to investigate accreditation effects on clinical outcomes. Overall, the results showed a clear trend toward a positive relationship between accreditation and clinical outcome. Studies reported having (n = 15) or lacking (n = 5) positive effects on clinical outcomes, whereas none of the studies concluded having an overall negative impact. In-hospital mortality rate (n = 13) and the patient's length of stay (n = 12) were studied the most.

Comparative studies showed a positive effect of accreditation on mortality rates at various accreditation stages [118-123]. However, these studies were restricted to two accreditation schemes, namely, The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) in the USA and the Danish healthcare quality program (DDKM in Danish: Den Danske Kvalitetsmodel) in Denmark, which may hinder generalization. For example, relative to hospitals with low [121, 122] or persistently low [123] accreditation standards compliance, patients treated in highly compliant hospitals were found to have significantly lower mortality. Dissimilarly, such a relationship was not identified in other studies [20, 33, 71, 124-126].

Several studies consistently indicated a lack of relationship between accreditation and hospital 30-day readmission rate in various contexts [20, 123, 127, 128], whereas other studies presented contradictory effects on healthcare-associated infections [38, 124, 129, 130]. However, studies reported a consistently positive impact of accreditation on the hospital [33, 123, 127, 131] and departmental [129, 132, 133] patient length of stay.

- ***Changes in the performance measures***

There is plausible evidence that hospital accreditation promotes service quality. Consequently, improvement in structure and process performance measures could be expected [20, 122]. The impact of accreditation on performance measures was the largest topic (n = 28) explored in this review [24, 32, 37, 71, 73, 88, 91, 93, 99, 107, 118, 125, 128, 134-148]. Despite the complexity and cyclicality of accreditation effects on performance measures, about three-fourths (n = 18) of the analyzed studies showed a positive effect of accreditation on service quality at organizational and departmental levels.

Although the only included RCT reported no or low association between accreditation and quality indicators [88], the methodological quality of this RCT was fair but not good enough to generalize this finding. It is noteworthy that several quasi-experimental and prospective longitudinal studies reported significant positive effects of accreditation on various quality of service aspects [32, 71, 99, 134-136]. Accumulated evidence showed that longitudinal participation in accreditation translated into higher standards compliance [99], adherence to recommended guidelines [134], enhancement in structural and process elements [24, 37], and sustained change [135]. For instance, in a stepped-wedge multi-level study, accreditation resulted in significant improvement of various processes that did not meet the target performance during the 6 months prior to the accreditation survey [136]. Participation in accreditation has shown tangible benefits in performance measures linked to acute myocardial infarction [118, 137], heart failure, and pneumonia [137]. Nevertheless, some studies have found that accreditation is not associated with hand hygiene compliance [138], medication administration error rates [139], and other performance measures [125, 140, 141].

- ***Changes in economic outcomes***

A total of eight studies evaluating the economic effects of accreditation have been included [43, 122, 128, 149-153]. Most of them (n = 5) showed a positive impact on

various economic outcomes, particularly healthcare efficiency.

Apart from estimating the cost of accreditation, which varied dramatically between countries and programs, accreditation was shown to have a significantly favorable effect on cost reduction [128], increase in the share of outpatient revenue [122], higher productivity [149], and improved efficiency [43, 150, 151]. For example, a large retrospective longitudinal study, tracking 748 hospitals over 10 years, reported a significant positive net impact of hospital accreditation on improving the mean efficiency as estimated through bootstrapped data envelopment analysis (DEA) during the accreditation year and the two years following [43]. Another observational study found that hospital accreditation, ceteris paribus, was associated with a 119% improvement in a quality index relative to baseline data, which translated into a combined saving of US$ 593.000 in two hospitals over three years [128]. On the contrary, participating in accreditation programs was found to have an inverse effect on hospital efficiency secondary to higher staffing demand and investment in equipment [152]. Other studies did not detect a major impact of accreditation on operating room efficiency [153], cash-flow margin, and total cost per case [122].

2.4 DISCUSSION

This review has comprehensively analyzed the hospital accreditation literature during the last two decades to understand its effect on the quality of health services. In total, 76 studies have been included and assigned to a relevant impact category.

Despite the mixed views expressed, a positive accreditation effect was found in more than 55% of the included studies. The results of this review indicate a consistent positive accreditation effect on process-related performance measures, safety culture, hospital efficiency, and patient length of stay. In contrast, staff job stress was found to be consistently negatively affected. Heterogenous results on mortality and healthcare-associated infection hampered the drawing of firm conclusions on those outcome measures. Staff job satisfaction, patient satisfaction and experience, and 30-day readmission rate were found to be unrelated to accreditation. However, the variation in accreditation schemes [37], the inability to isolate extrinsic confounders, and the diversity in hospital characteristics may influence these conclusions.

Although culture is an oft-cited reason for failure, consistent with previous studies [22, 28, 35], this review found a positive effect of accreditation on safety culture at the organizational level. However, at the individual level, accreditation has an adverse impact on professionals' stress levels [98, 100-102]. This may indicate a need for a balance between accreditation risks and benefits to encourage health practitioners' acceptance and participation in the accreditation journey [23, 154]. This negative consequence seems inevitable. However, awareness campaigns, leadership support, and better design of accreditation standards and processes are vital remedies that need to be considered [155].

As an extension of previous reviews [27, 28, 35, 64], the analysis of this review did not find a correlation between accreditation and higher patient satisfaction or experience. The earlier presumption that patient satisfaction is a reverberation of hospital quality of service [156] was not confirmed in this review. While the findings of this review support the view that accreditation is a tool that stimulates improving internal processes delivery [157], the appropriate improvement threshold for being tangible is equivocal. Likely, the answer depends on the design of the accreditation standards and processes [3, 158].

This review found that hospital accreditation benefits appear before [32, 95], during [119], and after accreditation [134, 144]. Nevertheless, the question of the cyclicality of the impact of accreditation and how long the effect lasts is a matter of concern [34, 120, 136, 159]. For the economic outcomes, studies attribute the favorable impact of accreditation to performance improvement [128]. However, the low number of studies hindered definite conclusions. Isolating the accreditation's financial impact from other contextual factors is challenging and may explain the paucity of studies in this domain [28, 160].

More studies on the impact of hospital accreditation are needed to elucidate part of the *jigsaw puzzle*. An argument might be that the heterogeneity in the accreditation literature and its observational nature limits its value in providing convincing conclusions on accreditation effectiveness [161]. However, the absence of firm evidence of the effects is not evidence of a lack of effect. Having realized the ethical and practical challenges of conducting randomized trials on this multifaceted process [14], observational studies appear to be of doubtless merit despite their drawbacks.

The bulk of the studies in this review used cross-sectional or two-point comparative (i.e. before-and-after) designs. Therefore, an argument could be that the observed improvement in observational studies is not necessarily attributed to the accreditation *per se*. However, this assumption does not rationalize abandoning what has been found already, and if observed improvements were secondary to other accreditation-driven factors, it is indeed still a win-win situation.

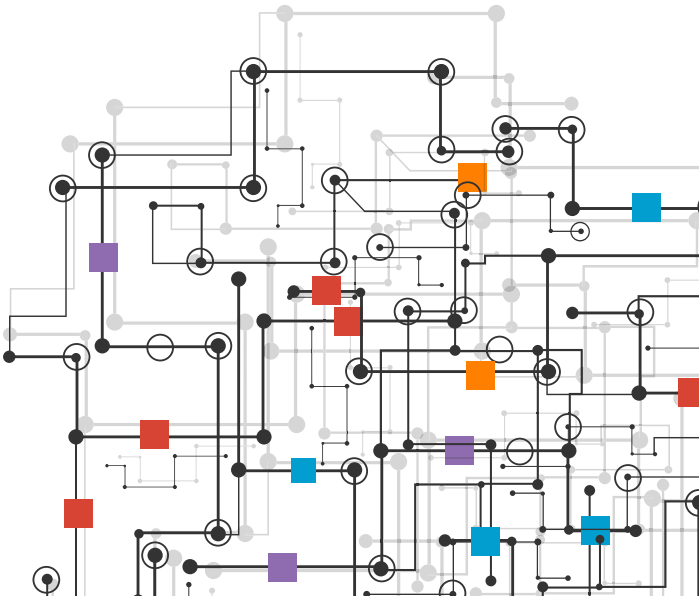
The systematic review presented in this chapter has several strengths and limitations. It is one of the largest systematic reviews conducted to understand the impact of hospital accreditation. The review extensively discussed the measures and aspects being addressed and affected by introducing hospital accreditation to elucidate the complex view for researchers, policymakers, and stakeholders in the accreditation field. The use of pre-decided inclusion criteria, citation indices, and a broad range of databases were enablers to enhance the likelihood of identifying all relevant publications. Overlooking some studies that are not published in peer-reviewed journals is still possible. However, the comprehensive search that was conducted suggests that results bias is unlikely. It should acknowledge, however, that not searching the grey literature is a limitation in this systematic review. The grey literature can provide a valuable contribution to the review and may reduce publication bias [162]. However, to maintain the validity of the results, the search was limited to studies rigorously peer-reviewed or indexed in academic journals [163]. Despite the fact that this review included evidence on accreditation effectiveness in both developing and developed countries, no distinction between these settings was made.

2.5 CONCLUSION

Accreditation must be viewed as one element that complements other performance improvement strategies to achieve a tactile effect in the health system. The view must be compatible with the fact that accreditation is a "knowledge translation" intervention that aids in the integration of standards into everyday activities [21]. The advantages of accreditation outweigh the potential drawbacks. However, this chapter echoes previous reviews [8, 12, 25, 35, 36, 164] in calling for further rigorous studies to investigate the impact of accreditation, particularly on economic outcomes, to evaluate if the benefits genuinely justify the costs. Utilizing longitudinal designs and controlling for exogenous confounders could help detect

causal conclusions of accreditation effects and enrich consequential decisions in this realm.

The results of this review underpin the notion that compliance with accreditation standards has multiple plausible benefits in improving performance in hospital settings and outcomes. Despite inconclusive evidence on causality and minor unintended negative consequences of hospital accreditation, such as those on job stress, this chapter concludes that introducing hospital accreditation stimulates performance improvement and patient safety. In synchronization with other health policies, efforts to incentivize and modernize accreditation are recommended to move towards institutionalization and sustaining the performance gains.



CHAPTER 3

THE ATTITUDE OF HOSPITAL DIRECTORS IN SAUDI ARABIA TOWARDS NORMALIZING ACCREDITATION STANDARDS: A QUALITATIVE DESCRIPTIVE STUDY

This chapter draws upon:

Hussein M, Pavlova M, Groot W. The attitude of hospital directors towards normalizing accreditation standards: a qualitative descriptive study for Saudi Arabia. Int J Qual Health Care. 2022;34(3):1-7.

ABSTRACT

Background

The engagement of stakeholders in pursuing accreditation plays a critical role in integrating standards into routine practice. This chapter explores the attitude of hospital directors towards accreditation and investigates the mechanisms of normalizing accreditation standards in Saudi Arabian hospitals.

Methods

Fifteen hospital directors across Saudi Arabia participated in semi-structured qualitative interviews. The interviews were conducted virtually, audiotaped, transcribed verbatim, and then analyzed thematically using the NVivo-12 software package. The normalization process theory (i.e. coherence, participation, actions, and monitoring) was adopted to frame the chapter and describe the findings on normalizing accreditation standards heuristically.

Results

Overall, the hospital directors perceived accreditation favorably, particularly those with more experience or previous exposure to accreditation. The clarity of standards, availability of full-time quality professionals, and alignment of accreditation standards with hospital strategies assisted hospital directors in making sense of accreditation and moving towards engaging hospital teams in the process. This motivation-driven engagement catalyzed the initiation of purposeful operational activities to integrate standards in operations. The integration included distributing standard sets to relevant owners, conducting gap analysis, constructing a corrective plan, and prioritizing tasks within timeframes. Despite the financial and structural constraints experienced, the integration resulted in enhanced organizational safety culture, team spirit, communication, public trust, reporting of safety concerns, and standardizing of procedures. Following the integration, the objective appraisal of accreditation benefits was critical in addressing what went wrong, what worked well, and subsequently in sustaining performance gains.

Conclusion

The effectiveness of integrating accreditation standards heavily relies on making sense of accreditation and understanding the mechanisms through which standards are routinized into operations. This chapter indicates that standards integration phases are sequential, interlinked, and influenced by culture, teamwork, and leadership engagement.

3.1 BACKGROUND

Quality improvement is a strategic priority for all healthcare systems. Globally, accreditation has acquired a progressive position among quality improvement strategies. As defined in Chapter 1, accreditation is an external evaluation of healthcare institutions' compliance with predefined standards. Chapter 2 in this dissertation provided evidence for the positive impact of hospital accreditation on the quality of healthcare services. However, the contextual heterogeneity of accreditation policies, scarcity of persuasive causal studies on its value, and the substantial expenditures necessary to meet accreditation standards could, in part, contribute to the conflicting views on the value of accreditation.

Similarly, the evidence on the perception of stakeholders on whether accreditation is effective presents a mixed picture [11]. Some studies criticize accreditation for being disruptive to patient care, timely, costly, bureaucratic, and insensitive to outcomes [29, 30], while others praise its role in promoting organizational performance and standardizing processes [31, 66]. Mitchell *et al*. [21] intensify the role of accreditation in innervating performance improvement by bridging the know-do gap. Indeed, evaluating the effectiveness of accreditation is heavily reliant on understanding the mechanisms through which standards are integrated into business operations.

Integrating standards in healthcare facilities is context-sensitive and is determined by diverse factors. In this context, the engagement of leaders in pursuing accreditation is one of the key determinants [62, 63]. Therefore, analyzing how leaders perceive accreditation may contribute to fostering a greater acceptance and tailoring of accreditation design to hospital needs, thereby offering a deeper understanding of the mechanisms of normalizing (i.e. making variable performance conform to standard) accreditation standards [17]. To address these issues, the chapter presents evidence of hospital directors' attitudes toward normalizing accreditation standards in Saudi Arabia.

As mentioned in Chapter 1, there are over 450 public and private hospitals in Saudi Arabia. Alongside other management tools, a mandatory accreditation scheme to enhance the quality of healthcare services has been adopted. However, there have been no studies on the working process of accreditation or the attitudes of hospital leaders toward accreditation in the Saudi context. Hence, the aim of this chapter

is twofold; first, to explore the attitude of hospital directors toward Saudi Arabia's national accreditation program, and second, to investigate the mechanisms through which accreditation standards are normalized in hospital operations, using the normalization process theory (NPT), which is a sociological middle-range theory that offers heuristic explanations for the mechanism of incorporating complex interventions, such as accreditation, into routine practice [165].

3.2 METHODS

Design and sample

In concordant with the exploratory nature of the study presented in this chapter, a semi-structured qualitative interview method was employed to rigorously explore the aims of the chapter. Since exposure to recurring accreditation visits might influence the perception of hospital directors and hence jeopardize the validity of the findings [166], the inclusion was limited to hospitals that had had one accreditation visit and had subsequently been accredited for at least six months prior to the interview. The publicly accessible list of accredited hospitals on the CBAHI website revealed that 20 hospitals satisfied the inclusion criteria [60]. The leading individuals in these hospitals (called henceforth "hospital directors") were invited to participate in the study, provided that they had been in their positions for at least six months prior to the accreditation visit and six months thereafter. Consistent with previous studies [134, 135], this timeframe was assumed to be sufficient for them to acquire adequate exposure and an understanding of the accreditation processes. Of the 20 hospital directors approached, two did not meet the timeline criteria, while three declined participation for personal reasons. A consent form and an explanatory information sheet were emailed to the remaining 15 participants. Consent was deemed to have been declared if the email was replied to with a positive response. Next, one-to-one interviews were scheduled for times that suited the participants.

Qualitative interviews and transcript preparation

All the interviews were conducted and recorded virtually by one of the researchers, using the Zoom videoconferencing platform, during the period of May to June 2021. The security and cost-effectiveness of virtual qualitative interviews have been praised, particularly when participants are geographically dispersed [167]. At the commencement of the interviews, consent declarations were verified and

voluntary participation was emphasized. The interviews were then directed using an interview guide that had been meticulously developed by the research team following an extensive review of the existing literature. The guide featured a series of open-ended questions that were informed by the NPT to reveal various aspects of integrating accreditation (Appendix B1). Additionally, probing questions were used to assist in clarifying potentially confusing aspects. No new information emerged after 12 interviews, which was further confirmed when the remaining three interviews were completed, indicating thematic saturation and sample size adequacy [168]. On average, each interview lasted for 40 minutes. Thereafter, the interviewer transcribed the audiotapes verbatim and shared the transcriptions with the participants at the earliest possible time for comments and corrections [169].

Transcript analysis and theoretical framework

One of the researchers reviewed the transcriptions to get acquainted with the data and detect suitable codes. Thematic content analysis was employed to aggregate similar textual segments into a single code, and then group the interlinked codes into a relevant theme [86]. Subsequently, multiple thematic refinements were assumed to avert overlapping and to ensure the logical grouping of identified themes. Notably, the NPT was adopted as an explorative model to elucidate the working mechanisms of accreditation, from introduction to normalization [165]. The theory distinguishes between four integrated constructs that focus on the work required to accomplish routinization (coherence, cognitive participation, collective actions, and reflexive monitoring), which offers a rigorous analytical framework to understand the dynamics influencing the successful deployment and integration of a new intervention, such as accreditation, into routine practice. Hence, the suitability of the NPT has been determined to characterize the dynamic actions required by stakeholders to integrate accreditation standards into business operations. Consequently, emerging themes were sorted taxonomically under the constructs outlined in the NPT. The NVivo-12 software package was used to structure the iterative codes. Coding tree is presented in Appendix B2.

Qualitative trustworthiness and reporting

To ensure the trustworthiness of the results presented in this chapter, numerous credibility, transferability, and dependability endorsements were employed. Measures such as testing the efficiency of the interview guide, allocating sufficient time to collect data, iterative questioning, constant peer debriefings, member checking, and

theoretically guided analysis were used to ensure credibility. Additionally, methodical coding verification, reaching thematic saturation, and carrying out the research protocol as initially planned were deemed necessary to ensure the transferability of the findings to other contexts. Furthermore, the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist was assumed to assure dependability, improve reporting quality, and facilitate the derivation of intelligible and auditable conclusions [170]. The findings were supported by transparent, yet anonymous, quotes. The participants were designated by the letter "P", followed by an Arabic numeral denoting the order of an interview.

3.3 RESULTS

Sample characteristics

In total, 15 hospital directors were interviewed, most of whom were physicians with over six years of experience. Approximately half of them (47%) had been in their current posts for three years or less (Table 3.1). The hospitals were surveyed for accreditation between July 2019 and October 2020. Most of them were public (60%), provided acute care service (73%), and had less than 300 beds (86%). On average, these hospitals employed a full-time quality professional for every 25 to 30 beds.

Table 3.1 Demographics of interviewed participants (n=15)

Characteristics	n (%)
Gender, Male	15 (100)
Educational background	
Physicians	8 (53)
Health Administration	4 (27)
Others	3 (20)
Level of education	
Bachelor	9 (60)
Master	5 (33)
PhD	1 (7)
Total years of experience	
4 – 6 years	3 (20)
7 – 9 years	5 (33)
> 9 years	7 (47)
Experience in the current position	
1 – 3 years	7 (47)
4 – 6 years	5 (33)
7 – 9 years	3 (20)
Previous experience in accreditation	
Yes	7 (47)
No	8 (53)

Thematically, a total of 621 textual segments were grouped into 29 codes, which were subsequently used to synthesize 11 distinct, yet interrelated, themes. Despite disparities in participant and hospital characteristics, no thematic differences were identified. The emerging themes were tabulated into the NPT constructs; coherence, cognitive participation, collective actions, and reflexive monitoring, as summarized in Table 3.2.

Table 3.2 Summary of themes and codes from the participant's perspective

NPT Constructs	Themes	Codes
Coherence: how hospital directors understand and recognize hospital accreditation programs individually and collectively.	Sense-making toward the accreditation program	• Define accreditation • Understand accreditation processes • Recognize the anticipated benefits of accreditation
	Understand accreditation standards	• Standards clarity and relevancy • Alignment of accreditation standards with organizational strategic goals
Cognitive Participation: how hospital directors sustain engagement in accreditation integration individually and collectively.	Attitude	• Perceiving change positively • Skeptical approach toward change
	Time consumption	• Time required for initiation and integration.
	Organizational engagement	• The role of leaders in driving accreditation • Motives for leaders' participation • Motives for team participation
Collective Actions: how hospital directors integrate accreditation standards with daily business operations.	Integration and operationalization	• Gap analysis and taskforces formation • Enact a set of implementation practices • Monitoring the progress of integration
	Resources allocation	• Direct financial expenditure • Indirect financial expenditure
	Workability	• Driving factors of accreditation integration • Restraining factors of accreditation integration
Reflexive Monitoring: how do hospital directors reflect and appraise the accreditation program and its effect?	Appraise accreditation program	• Appraise surveying activities • Appraise surveyors (i.e. evaluation team)
	Evaluate effectiveness & worthiness	• Impact at the organizational level • Impact at the patient level • Impact at the staff level • Impact on the clinical outcomes • Impact on the economic outcomes
	Practice differently	• Moving towards patient-centeredness • Deploy quality and patient safety culture • Utilize team-based approach • Embrace performance management and benchmarking

NPT, normalization process theory

Coherence

Responses to defining accreditation were heterogeneous and influenced by various determinants. The participants with fewer years of experience described accreditation as an evaluation tool to detect system insufficiencies or a marketing tool to enhance reputation, whereas those with longer experience or who had had previous exposure to accreditation processes defined accreditation as a management tool that assisted in outlining business activities and promoting the quality of care. One of the participants commented:

> *"I am the hospital director today but a patient tomorrow. Quality improvement is the target, while accreditation is a supporting tool that stimulates the process of implementing quality systems" (P12)*

Four primary concerns were raised by the participants when initially faced with the accreditation program: the mandatory nature, the irrelevancy of the standards in specialized hospitals, the large proportion of professionals with limited quality literacy, and a lack of quality culture. However, the participants emphasized the role of the clarity of standards, the availability of full-time quality professionals, and the alignment of accreditation standards with hospital strategic plans in accelerating the coherence phase towards engaging hospital teams in the process. As stated by one of the participants:

> *"I think, obligating accreditation might defeat its purpose and give the process an inspection flavor [...], it contradicts the commitment to duty of the health professionals toward patients" (P4)*

Cognitive participation

All the participants consistently underlined the important role of hospital directors in driving the integration of accreditation. Alike, they emphasized the necessity for teamwork and engagement of frontline staff in coproduction. The analysis revealed two management approaches in terms of engagement. Following the first approach, most participants perceived the capacity of accreditation to promote the practice positively. Consequently, they eagerly assumed administrative and technical roles in leading the change. The main motivators in this approach were dedication to safety, meeting strategic goals, enhancing the learning experience, and raising external reputation.

In the second approach, the participants adopted a delegative style of quality-related activities and tended to acquire accreditation with the least possible effort. The participants ascribed this skeptical approach to the lengthy accreditation process, the reluctance of health workers to participate, and the magnitude of anticipated changes. The main grounds for participation were marketing, regulatory obligations, and pressure from governance bodies. As one participant put it:

> *"each standard represents a level of quality to be attained, and each attainment requires introducing certain changes whether on small or hospital-wide scales. I was not ready to begin this experience while surrounded by hesitant co-workers" (P7)*

Several strategies, such as involving staff in the design phase, incentives, awareness campaigns, maintaining quality as a standing agenda item in departmental meetings, and presenting standards alongside convincing factual evidence (i.e. empirical-rational strategy), were employed to facilitate the engagement of frontline staff in the change process. This engagement was the paramount catalyst for moving into the action phase, as illustrated in the following quote:

> *"the most often asked question along the way was "why is this standard important?" supporting the explanation with evidence was the secret buy-in strategy to get everybody on-board and kick-off implementation, particularly healthcare professionals" (P12)*

Collective actions

The participants employed a bundle of purposeful operational activities to integrate standards into daily operations. Initially, standard sets were distributed to relevant owners to familiarise them with the content. Besides, task forces were formed to undertake gap analysis, construct a corrective plan, prioritize tasks, and define timeframes accordingly. Concurrently, communication and monitoring systems were established to enhance efficiency, encourage relational work between and within taskforces, and ensure prompt implementation of actions. Subsequently, tasks such as policy development, infrastructure repair, and training were initiated. Occasionally, due to time constraints, certain activities were patchy, or improperly implemented (i.e. workarounds), to comply with the standards. This premise can be seen in the following extract:

"the required time considerably surpassed our estimates and plans. We tend to use shortcuts as we were in a race against the clock, and we postponed determining what went wrong until after the survey visit" (P1)

The integration process was influenced by multiple factors. The main challenges addressed by the participants were financial constraints, workforce insufficiency, and infrastructural inadequacy. Nonetheless, as described by the participants, adequate support for the process and taskforces at this point was vital in attaining accreditation, despite hurdles and pressures. One of the participants summarised the challenges by saying:

"accreditation process was not without cost. In addition to the direct expenses such as manpower recruitment and training. An indirect cost was demonstrated by pulling our health professionals away from their clinical duties" (P14)

Reflexive monitoring

Most participants agreed that an objective evaluation of accreditation worthiness following the integration of standards was critical to understanding new practices, averting the undermining of accreditation effectiveness, and sustaining performance gains. The evaluation included surveying activities, revisiting the performed time-saving shortcuts, and identifying residual nonconformance, thus gleaning lessons from the achieved successes.

Overall, the participants viewed accreditation favorably. As described, the integration of standards was associated with the adjustment of various internal practices related to patient-centeredness, safety, and performance management. This enhanced organizational safety culture, as evidenced by the creation of a common quality language among staff. In addition, fostering team spirit, enhancing communication, standardizing procedures, promoting public trust, and increasing the reporting of safety concerns were delineated. These effects were attributed to preparatory efforts rather than the accreditation visit itself. Noteworthily, although the participants reported no unintended consequences associated with the process other than co-worker stress, several reflective concerns were raised regarding variability among surveyors, the reliability of evaluating performance using a snapshot sample, and the capacity of accreditation to produce sustainable patient

and economic outcomes. One participant stated:

> *"I have seen processes such as outpatient waiting time, cancellation rate in the operating room, and hand hygiene compliance improved considerably. However, I cannot presume an impact on patient outcomes following the survey, probably more time is needed to determine that" (P8)*

3.4 DISCUSSION

This chapter indicates that hospital directors, particularly those with more experience or previous exposure to accreditation, viewed accreditation favorably. Indeed, several factors assisted hospital directors in making sense of accreditation and initiating multiple mechanisms to normalize standards into business operations subsequently. In this chapter, the NPT constructs outlined these normalization mechanisms. Importantly, the normalization resulted in enhanced organizational safety culture, team spirit, communication, public trust, reporting of safety concerns, and standardizing of procedures.

This chapter explored the attitudes of hospital directors towards accreditation and investigated the mechanisms through which accreditation standards are normalized in Saudi Arabian hospitals. Although the results presented in this chapter are relevant to a broad context, the transferability of the results should still account for contextual differences. As to limitations, the inherent recall bias of qualitative approaches may have biased the results presented in this chapter. However, adopting a theoretical framework, employing trustworthiness techniques, reaching thematic saturation, and using methodological coding increased the credibility of the findings and assisted in structuring a conclusion that is highly consistent with accreditation publications. In the analysis, due to the known overlap across the NPT constructs [165], themes were allocated meticulously in a mutually exclusive manner to avert possible duplication and reserve the inductive nature of the study presented in this chapter.

Consistent with previous studies [31, 53, 63], the overall attitude of the participants towards accreditation was favorable. However, the years of experience might have had a confounding effect, as those participants with longer experience or previous

exposure to accreditation perceived accreditation more meaningfully; a notion that is supported in Ellis *et al.'s* study [62].

In alignment with the NPT framework, the findings in this chapter indicate that the integration phases of accreditation are sequential and interlinked. The progress in each stage is highly influenced by culture, teamwork, and the degree to which hospital directors understand and orchestrate accreditation, as described by the participants. As indicated in this chapter, making sense of the accreditation program and standards, *coherence,* greatly affected participants' attitudes toward assuming a leading position in the integration process. Although the participants were, hierarchically, in an influential position, the cultural resistance to introducing a major change during standards integration requires a blurring of the line between leaders and frontline workers; *cognitive participation*. This collective engagement lends credence to previous studies that emphasized the crucial role of teamwork in implementing complex interventions [52, 155]. However, engaging frontline workers was a strenuous task that required individualized approaches to be successful.

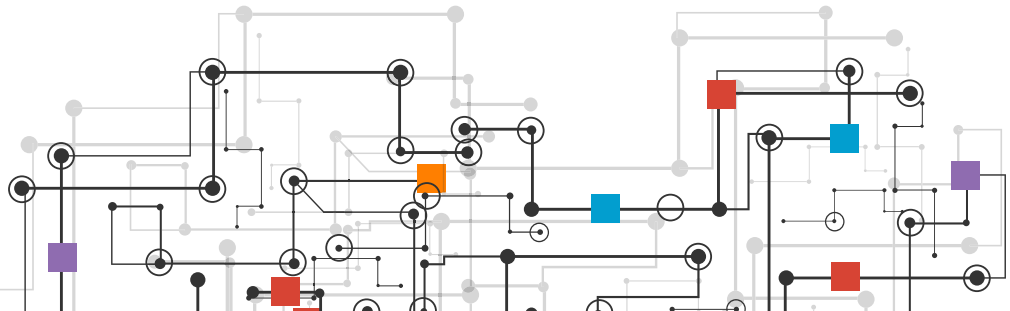
In the implementation phase, *collective actions*, a series of purposeful activities, were necessary to routinize standards in daily operations. As reported in various contexts, these actions were challenged by financial restrictions, structural inadequacy, and the skeptical behavior of leaders [29, 31]. Furthermore, time constraints and co-worker stress generated certain workarounds to achieve artificial happy ends, resulting in a mismatch between the actual practice and the evidence handed to the accreditation survey team [52, 171]. The reported stress reaffirmed the need for suitable protocols to support co-workers throughout accreditation. Last, the post-survey appraisal was used to address what went wrong and what worked well; *reflexive monitoring*. In agreement with prior studies [66, 97, 172], the oft-reported positive effect was the promotion of patient safety culture. However, several concerns were raised by the participants, such as variability among surveyors [53], the irrelevance of some standards [63], and the uncertainty of outcomes [173]. The latter may be, in part, attributed to the nature of accreditation standards that emphasize organizational structure and process rather than outcomes [57].

The findings in this chapter emphasize the importance of exploring the attitude of hospital directors in developing and implementing accreditation schemes. Failure

to engage stakeholders in the process may result in disillusionment and alienation from the accreditation. This dissertation echoes recent publications urging accrediting agencies to adopt a bottom-up approach in designing and flowcharting the accreditation process [17, 62, 155, 171]. Despite cultural differences, the contextual lessons learned from this chapter offer stakeholders and policymakers evidence to assist them in implementing and evaluating accreditation effectively and are anticipated to demonstrate implications that cross boundaries due to the high degree of similarity in accreditation programs worldwide [9]. Future studies, which might be based on NPT, are necessary to evaluate the strategies that consolidate the engagement of stakeholders. Furthermore, a longitudinal investigation of changes in the attitudes of leaders towards accreditation over recurrent accreditation cycles may also add value.

3.5 CONCLUSION

Exploring the attitudes of hospital directors toward accreditation reveals aspects that influence the integration of accreditation standards and contribute to the long-term sustainability of accreditation programs. The effectiveness of integrating accreditation standards heavily relies on making sense of accreditation and understanding the mechanisms through which standards are routinized into operations. This chapter indicates that hospital directors perceived accreditation favorably. Using NPT constructs, the results also indicate that standards integration phases are sequential, interlinked, and influenced by culture, teamwork, and leadership engagement. The findings help in clarifying the accreditation operating process, which may be helpful to policymakers and stakeholders in making informed decisions on the integration of accreditation standards.



CHAPTER 4

AN EVALUATION OF THE DRIVING AND RESTRAINING FACTORS AFFECTING THE IMPLEMENTATION OF HOSPITAL ACCREDITATION STANDARDS IN SAUDI ARABIA: A FORCE FIELD ANALYSIS

This chapter draws upon:

Hussein M, Pavlova M, Groot W. An evaluation of the driving and restraining factors affecting the implementation of hospital accreditation standards: a force field analysis. Int J Healthc Manag 2022; June 11. [Epub ahead of print].

ABSTRACT

Background

Integrating accreditation standards in healthcare business operations is context-sensitive and affected by diverse factors. This chapter explores the driving and restraining factors influencing the implementation of accreditation standards in Saudi Arabian hospitals.

Methods

A qualitative design using semi-structured in-depth interviews was employed in this chapter. Twenty-seven hospital directors and 29 hospital quality directors were interviewed. Interviews were recorded, transcribed verbatim, and thematically analyzed. A force-field analysis framework was adopted to present a visual picture of the various factors influencing the implementation of hospital accreditation standards.

Results

The analysis yielded 42 driving and restraining factors affecting the implementation of accreditation standards. The main drivers identified were teamwork, the quality mindset of leaders and staff, employing a continuous readiness model, and commitment toward customers. By contrast, insufficient manpower, infrastructural gaps, workforce recruitment challenges, variability among surveyors, the COVID-19 pandemic, limited financial support, and bureaucratic decision-making procedures were the main reported restrainers. At the national level, perceived restrainers pose a serious challenge to compliance with the existing hospital accreditation model.

Conclusion

Exploring the factors affecting accreditation standards implementation assists in assessing accreditation readiness, helps to prioritize efforts to strengthen drivers and weaken restrainers, and contributes to the institutionalization of accreditation standards.

4.1 BACKGROUND

Accreditation has become an indispensable part of healthcare quality systems and is widely embraced as a performance improvement tool in healthcare, as outlined in Chapter 1. Accreditation programs were designed primarily to improve service quality in healthcare organizations through external evaluations of their compliance with established performance standards [15]. Although early reviews of accreditation effectiveness showed inconclusive results [8, 12], the systematic review presented in Chapter 2 found reasonable evidence of the positive impact of accreditation on various aspects.

As evidenced in Chapter 3, the heterogeneity of accreditation schemes has reverberated on the factors influencing standards implementation. These experiential factors are context-sensitive. For instance, infrastructural and cultural constraints were reported as the main challenges in low- and middle-income countries [53-55], whereas accreditation processes *per se* were indicated as key obstacles in other nations [174]. Hinchcliff *et al.* [56] proposed enablers, such as standards clarity and a positive culture of quality integration, as ways, to effectively overcome such challenges.

The implementation of accreditation standards is a change-oriented process that necessitates accreditation standards to be ratified in order to enhance performance within the care system [52]. This process is influenced positively and negatively by factors from within and outside the system [19]. Identifying these factors is critical for assisting policymakers, accreditors, and stakeholders in making informed decisions during the accreditation journey [21]. As stated in Chapter 1, Saudi Arabia has established a nationally tailored hospital accreditation program to enhance the quality of hospital services. However, despite the mandatory nature of this program and the periodic updates of accreditation standards, statistics indicate that around one-third of the hospitals operating in Saudi Arabia were not able to show a satisfactory compliance level during the initial accreditation visit, and were eventually denied accreditation [60]. Unlike the many studies on the impact of accreditation, little evidence is available on these factors, particularly the driving factors. Hence, this chapter aims to explore the perceived driving and restraining factors influencing the implementation of accreditation standards in Saudi Arabian hospitals.

4.2 METHODS

Design, setting, and sample

A qualitative design using semi-structured in-depth interviews was employed in this chapter to produce a comprehensive in-depth understanding of the factors encountered throughout the implementation of accreditation standards. To avoid the potential information bias that may result from previous exposure to multiple accreditation visits [166], the inclusion was limited to hospitals that had undergone only one accreditation visit by the national program, irrespective of the survey outcome. The accreditation status list published on the webpage of CBAHI was used to identify target hospitals (N = 138) and stratify them into subgroups, considering certain confounders that could influence the affecting factors, such as geographical location, accreditation status, ownership, scope of service, and bed size [60]. Criterion purposive sampling was then used to select one or more hospitals from each subgroup to enable the investigation of various perspectives. This yielded a sample size of 30 hospitals.

In each selected hospital, the highest authorized person in the hospital ("hospital director" henceforth) and the person in charge of quality and accreditation activities ("quality director" henceforth) were invited telephonically to participate in the interview if they had been in their positions at least six months prior to the accreditation visit. This timeline was considered sufficient for examining the experienced factors because accreditation preparation efforts are intense in the months preceding the accreditation visit [134, 135]. Of the 60 potential participants approached, one newly appointed hospital director was excluded, and three participants declined to participate for personal reasons.

Qualitative interview procedure

Participants who voluntarily agreed to participate (n = 56) received an introductory email along with a detailed information sheet and consent form. To protect the participants' signature anonymity, email responses accepting participation were deemed declarations of consent. Thereafter, the participants were assigned to individual interviews (i.e. one-to-one) at their convenience.

Between April and June 2021, one research team member conducted and recorded all interviews virtually through the Zoom videoconferencing platform [167]. The interview dialogue was preceded by an explanation of the research purpose and

an assurance of ethical considerations. The interview was then steered using a schematic interview guide developed by the research team following an extensive review of the literature (Appendix C1). The questions were posed using non-convoluted language while probing techniques were employed to detect unforeseen factors and to offer enough space for the participants to express their thoughts. Each interview lasted 42 minutes on average.

Thematic saturation was assessed in parallel with the data collection using the approach proposed by Guest *et al.* [168]. A base size was determined (how we delineate the body of information identified in a dataset) of six, a run length (the number of interviews we were looking for) of three, and a 0% new information threshold (the scarceness level of new information) to define adequate thematic saturation (Appendix C2). No new information emerged after 35 interviews, indicating thematic saturation and adequate sample size. However, the research team decided to complete all planned interviews to recognize possible views of different contexts.

Transcript preparation and analysis

Recorded interviews were transcribed verbatim by one researcher and were then shared with each participant, along with a summary of the factors indicated during the interview at the earliest time possible for comments and corrections (i.e. member check) [169]. Thereafter, the research team meticulously reviewed the transcriptions to get acquainted with the data and detect relevant codes. Thematic content analysis [86] using the NVivo-12 software package was employed to group similar textual segments into meaningful codes that accurately described the interview content (Appendices C3 and C4). The research team then searched for patterns and themes in the detected codes. Next, multiple thematic refinement rounds were undertaken to avoid overlap and to ensure that the themes were explicitly defined.

Theoretical framework

The "force-field analysis" framework proposed by Kurt Lewin was adopted to understand the overall contextual forces that preserve the status quo of the national accreditation program. This theory emphasizes the associated driving forces that tend to initiate or maintain change and the resisting forces that attempt to hinder it. A successful change requires that the driving forces outweigh the resisting forces. This approach allows for a clear portrayal of the counterbalancing forces

and assists stakeholders in determining which forces need to be strengthened or weakened to bring about change [175].

At this phase, concomitantly to member checking, each interviewee was requested to assign a score on an ordinal scale of 1 to 5 for each identified factor depending on its significance, where 1 indicated "weak effect" and 5 indicated "strong effect". The weight of each factor was determined based on the assigned scores. Average scores were computed and rounded to the nearest intact number when scored by more than one participant. This procedure was in line with the "force-field analysis" principles to avoid weighting the factors inaccurately based on the number of times they were addressed during interviews.

Trustworthiness

Lincoln and Guba's [176] trustworthiness criteria were employed to ensure the credibility, dependability, confirmability, and transferability of the results presented in this chapter. Several measures were taken to maintain the credibility, such as testing the streamlines of the interview guide, ensuring genuinely voluntary participation, recruiting participants who were engaged in the process, using iterative questioning, allocating sufficient time to collect data, and conducting peer debriefings. Triangulation measures, such as using a methodological approach, theoretically guided analysis, and a transparent presentation of quotations from different perspectives were adopted to maintain confirmability. Furthermore, the COREQ-32 checklist was adopted to improve the quality of reporting and derive conclusions that policymakers, scholars, and accrediting agencies around the world could use in their local settings [170].

4.3 RESULTS

Sample characteristics

The participants comprised 29 hospital quality directors and 27 hospital directors. One-third (34%) of the participants held a postgraduate degree, with medicine (38%) being the most prevalent professional background. Most of the participants (66%) had over six years of experience. However, most (60%) lacked accreditation experience. Participants represent 30 hospitals that had accreditation visits between July 2019 and December 2020. Half of them were accredited, and most were public (70%), provided acute care services (77%), and had fewer than 100

beds (50%). The characteristics of hospitals and the demographics of interviewed participants are summarized in Tables 4.1 and 4.2.

Table 4.1 Characteristics of sample hospitals in relation to targeted hospitals.

Characteristics	Accreditation Status (n=30)			Targeted population (n=138)**
	Accredited (n=15)	Denied (n=15)*	Total sampled	
Sector				
Public	9	12	21	117
Private	6	3	9	21
Specialization				
General	11	12	23	124
Specialized	4	3	7	14
Hospital beds, mean (range)	160 (30-450)	100 (10-250)	-	87 (10-450)
< 100 bed	5	10	15	98
100 - 300 bed	8	5	13	24
> 300 bed	2	0	2	16

** Denied: hospitals surveyed but did not show a satisfactory level of compliance with the standards*
*** Targeted hospitals: hospitals that had only one accreditation visit, irrespective of the visit outcome*

Table 4.2 Demographics of interviewed participants (n=56)

Characteristics	Hospital Director (n=27)	Quality Director (n=29)	n	%
Gender, Male	27	16	43	76.8
Educational background				
Physicians	11	10	21	37.5
Health Administration	8	5	13	23.2
Nurses	2	8	10	17.9
Pharmacist	2	3	5	8.9
Others	4	3	7	12.5
Level of education				
Diploma	0	4	4	7.1
Bachelor	16	17	33	58.9
Master	9	8	17	30.4
PhD	2	0	2	3.6
Total years of experience				
1 – 3 years	4	4	8	14.3
4 – 6 years	5	6	11	19.6
7 – 9 years	6	8	14	25.0
> 9 years	12	11	23	41.1
Experience in the current position				
< 1 year	4	6	10	17.9
1 – 3 years	12	16	28	50.0
4 – 6 years	6	4	10	17.9
7 – 9 years	2	2	4	7.1
> 9 years	3	1	4	7.1
Previous experience in accreditation				
Yes	12	10	22	39.3
No	15	19	34	60.7

Themes

Overall, 1,600 similar textual segments were grouped into 42 codes, which were used to synthesize 17 themes. The themes indicate driving factors that positively facilitate compliance with accreditation standards and the restraining factors that hinder it. These factors originated from within (i.e. internal) and beyond (i.e. external) the hospital setting. To identify perceptual variations, multiple comparisons were conducted based on the type of hospital, accreditation status, and position of the participants. In contrast to the results for private hospitals, factors such as centralized purchasing processes, lack of contract oversight, and frequent personnel reallocation, were reported in public hospitals and were attributed to the bureaucratic centralized management approach. In addition, the responses from hospital directors emphasized external factors, while quality directors were more concerned with internal factors. However, thematic differences were not discernable. Thereafter, the themes were tabulated structurally under four categories: internal and external drivers, and internal and external restrainers. The summary of the analysis, along with supporting quotes, is presented in Table 4.3.

Table 4.3 Summary of the factors affecting accreditation standards implementation along with supporting quotes.

Themes	Factors - Codes	Participant Quotes Supporting Categories
Internal Driving Factors		
Structure	Embrace technological solutions	*"before accreditation preparation, a simple concept such as root cause analysis was perceived as an unknown language. Accreditation standards unify the language between our staff and leaders" [quality director, private accredited hospital].*
	Infrastructural adequacy	
Culture	Teamwork and an encouraging work environment	
	Foster quality and safety mindset by leaders and staff	
Human resources	Staff engagement and commitment	
	Staff with previous accreditation experience	
	Having full-time quality personnel	
Preparation process	Using a continuous readiness model	*"having long-term goals assisted us in developing a continuous monitoring system to address our shortcomings. This gave us the luxury in time to prepare ourselves for the accreditation survey" [hospital director, public accredited hospital].*
	Assigning accreditation standards to a relevant owner(s)	
Management	Clear hospital-wide strategic and operational plans	
	Intra-hospital incentive program	

Table 4.3 Continued

Themes	Factors - Codes	Participant Quotes Supporting Categories
External Driving Factors		
Governance and health policy	Linking accreditation to healthcare payment system Alignment of standards with the requirements of authoritative entities. National health transformation and privatization movement	*"impeding the national health legislative requirements within accreditation standards has added a regulatory flavor to them which enhanced our operational control and saved our time" [quality director, public accredited hospital]*
Accreditation model	Clarity and evidence-based accreditation standards Training on accreditation standards by the accrediting body National patient safety initiatives on essential safety requirements.	*"we found many answers for 'what are the steps of accreditation survey?' on internet forums. However, the orientation program by the accreditation body was of great value in assisting our staff and leaders in being familiar with the standards and the survey process" [quality director, public accredited hospital]*
Public recognition	Commitment toward customers Enhance reputation Community financial support (e.g. patients friends associations)	
Internal Restraining Factors		
Structure	Infrastructural gaps Technological system insufficiency	*"we were unable to meet accreditation requirements under the current structural conditions. I think, our old building was the biggest challenge we had. We were as though we were beating a dead horse" [quality director, public non-accredited hospital]*
Culture	Fear and resistance to change Lack of quality and safety culture	
Human resources	Low level of physician engagement High turnover rate and training of newcomers Lack of adequate training on quality and accreditation Insufficient manpower	*"because our leaders were unfamiliar with accreditation standards, they tended to delegate all accreditation operations to the quality department, further underestimating the needed time to comply with" [quality director, private accredited hospital]*
Preparation process	Just in time accreditation preparation Difficulty in prioritizing areas of improvement	
Management	Leader's misunderstanding of their role in quality management Lack of involvement in external quality activities	
External Restraining Factors		
Governance and health policy	Bureaucratic decision-making procedures Lack of governance knowledge and experience in quality Challenges in workforce recruitment	*"factors outside hospital level were a nightmare during accreditation preparation due to unexpectedly nature and lack of control on them. Even the maintenance contracts with third parties were out of our hands" [hospital director, public accredited hospital]*
Accreditation model and surveying	Standards irrelevancy in small and specialized hospitals A large number of standards Variability amongst surveyors Lack of surveying skills (low experience, not resilience)	*"it was unfair to judge the level of our performance when we were powerless during the COVID-19 crisis. Completing the required training courses and structural projects on time during the pandemic was out of the question" [hospital director, public non-accredited hospital]*
Economic constraints	Accreditation cost Limited financial support	
Biological	The pandemic situation of COVID-19	

- ***Internal drivers***

Eleven distinct yet interrelated internal driving factors emerged from the data. Cultural factors, such as work environment, effective communication, and team spirit, were reported quite often by the participants as being the most vital underlying factors that ensure a successful accreditation journey. For instance, most participants reported teamwork as an important enabling factor associated with their efforts to implement standards. Furthermore, many participants cited the link between human resources and management factors as a tangible enabler. Participants indicated that staff engagement, previous accreditation experience, and the presence of dedicated quality management staff helped facilitate compliance with accreditation standards. In addition, a clear hospital strategic plan, in which a performance gap analysis and monitoring are undertaken ahead of time to drive quality activities, was seen as a predisposing trigger for continuous accreditation readiness.

- ***External drivers***

The analysis revealed nine positive external influencers in the implementation of accreditation standards. At the policy level, participants highlighted the importance of a national strategy for transforming towards a value-based system in encouraging hospitals to improve performance. In addition, it was emphasized that the alignment of accreditation standards with the requirements of various national authoritative bodies fostered the adoption of accreditation standards. In the same vein, participants claimed that the accreditation model *per se* facilitated compliance with the standards through several endorsements, such as the clarity and evidenced-based nature of accreditation standards.

In terms of public recognition, participants emphasized the reciprocal role of the public in stimulating compliance with accreditation requirements. On the one hand, hospitals sought public trust and loyalty by using accreditation as a performance improvement tool. On the other hand, community leaders have played a voluntary societal role by assisting hospitals financially to meet accreditation requirements.

- ***Internal restrainers***

The participants reported several internal impediments that were encountered during the implementation of accreditation standards, such as manpower insufficiency, infrastructural inadequacy, lack of a safety culture, and limited physician engagement. Infrastructural inadequacy (e.g. fire alarm system malfunction) and technological system insufficiency (e.g. lacking a healthcare

information system) were the two main structural elements that negatively affected compliance with the accreditation requirements, as described by the participants. They linked these factors to human resource hindrances, such as manpower insufficiency, a low level of physician engagement, and a high rate of employee turnover. For instance, participants stated that efforts to resolve structural flaws have been hampered by a shortage of personnel.

Cultural constraints, such as resistance to change and lack of a safety culture, were intimately connected to delays in meeting accreditation standards. For example, some participants stated that their staff perceived the accreditation as disruptive to patient care and that the process is entirely the responsibility of quality management departments.

- ***External restrainers***

Ten external constraints emerged from the data. Inexperienced governance members, a centralized governance approach, and challenges to workforce recruitment were the main reported external constraints at the executive policy level. The latter challenge was the most commonly cited because of the unavailability of certain specialties (e.g. critical care intensivists) and lengthy recruitment procedures.

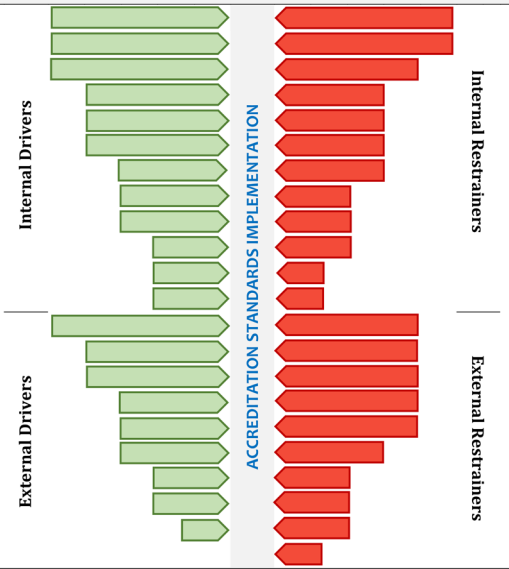
Although the participants valued the role of the accrediting body, as shown in Chapter 3, they indicated several impediments related to the accreditation model and surveying processes, such as accreditation cost, irrelevant standards in small and specialized hospitals, and variability in standards interpretation among surveyors. Similar to the findings in Chapter 3, variability among surveyors was reported as one of the major challenges faced by participants. In addition, the costs of adhering to accreditation standards and sustaining them were said to conflict with the budgetary restrictions of governance bodies. In private hospitals, the fee of the accreditation visit was regarded as an additional burden, on top of the compliance costs. Participants also described the difficulties of preparing for accreditation and sustaining appropriate service while confronting the COVID-19 pandemic.

Force-field analysis

The force field analysis offers a comprehensive picture of the balance of driving and restraining forces at the national level, as perceived by the participants (Figure 4.1). Structural and financial hindrances, such as infrastructural gaps, insufficient

manpower, and limited financial funds, were rated as the main challenges to accreditation implementation experienced by participants. On the other hand, many drivers have assisted stakeholders in implementing accreditation standards. At the national level, the number and significance of the identified driving and restraining forces indicate an equilibrium state, which suggests a serious challenge to implementing accreditation standards using the current accreditation model.

%*	Freq.*	Drivers**
93	52	Teamwork
52	29	Quality mindset by leaders and staff
39	22	Continuous readiness model
86	48	Staff engagement and commitment
82	46	Assigning standards to a relevant owner(s)
46	26	Encouraging work environment
32	18	Infrastructural adequacy
45	25	Embracing technological solutions
43	24	Clear strategic and operational plans
66	37	Full-time quality personnel
54	30	Intra-hospital incentive program
52	29	Previous accreditation experience
88	49	Commitment towards customers
77	43	Enhance reputation
75	42	Clarity of accreditation standards
50	28	Training on accreditation standards
38	21	Align standards with authoritative requirements
34	19	National patient safety initiatives
32	18	Linking accreditation to payment system
20	11	Health transformation and privatization
13	7	Community financial support



Restrainers**	Freq.*	%*
Insufficient manpower	45	80
Infrastructural gaps	43	77
Lack of quality and safety culture	26	46
Lack of adequate training	36	64
Fear and resistance of change	31	55
Unrecognized leaders' role in quality	28	50
Low level of physician engagement	24	43
Just-in-time preparation	15	27
High personnel turnover rate	21	38
Technological insufficiency	19	34
Difficulty in prioritizing areas of improvement	17	30
Detachment from external quality activities	14	25
Workforce recruitment	51	91
Variability amongst surveyors	46	82
COVID-19 pandemic situation	41	73
Limited financial support	39	70
Bureaucratic decision-making procedures	18	32
Accreditation cost	11	20
Lack of governance knowledge on quality	24	43
Lack of surveying skills	8	14
Standards irrelevancy	6	11
Large number of standards	7	13

Figure 4.1. The weight of factors affecting accreditation standards implementation

*(from the perspective of participants). * The number and percentage of participants who addressed and scored the factor. ** Factors are arranged based on significance in each category as per the perspective of participants.*

4.4 DISCUSSION

This chapter has investigated the enablers and challenges affecting the implementation of hospital accreditation standards from the perspective of hospital and quality directors in Saudi Arabia. The identified factors, whether originating from within or outside the hospital setting, were categorized as either driving forces that positively facilitated compliance with accreditation standards or restraining forces that hindered it.

Teamwork was the most commonly addressed internal enabler; this is consistent with the results presented in Chapter 3 and a previous study that emphasized the necessity of teamwork for delivering high-quality care [177]. The results also support the findings of the prior studies proposing that exemplary leaders and organizational culture foster ownership and engagement among frontline workers, which bring in cultural changes subsequently [9, 52, 58]. Furthermore, participants reported the importance of continuous accreditation readiness in anchoring standards to daily business and sustaining changes [135]. The sense of commitment to customers was cited as the most motivating external factor that encouraged the engagement of staff and leaders in the accreditation process. Participants reported that such engagement enhances the quality of patient care, which reflects the reputation of the organization in this era of competitive markets [178]. In contrast to prior studies that identified staff incentive programs [55, 179] and technological solutions [180] as important accreditation boosters, the results presented in this chapter found these factors to have only a modest effect on the process.

Concerning the restraining forces, the results presented in this chapter lend credence to previous studies that reported workforce insufficiency, recruitment challenges [10], infrastructure gaps, low levels of physician engagement [53], limited financial support [179], and bureaucratic decision-making procedures [55] as challenges to accreditation standards implementation. It is worth noting that participants cited several obstacles to the accreditation scheme itself, including accreditation cost [62, 179], standard irrelevancy [10], and lack of inter-surveyor reliability [10, 56, 57], which may urge the necessity to redesign accreditation and surveying models [67]. The challenges have been reported primarily in countries where accreditation is optional. However, in Saudi Arabia, despite the mandatory nature of the accreditation program, and the linkage of its outcome to the reimbursement system, the participants indicated that hospitals had experienced numerous

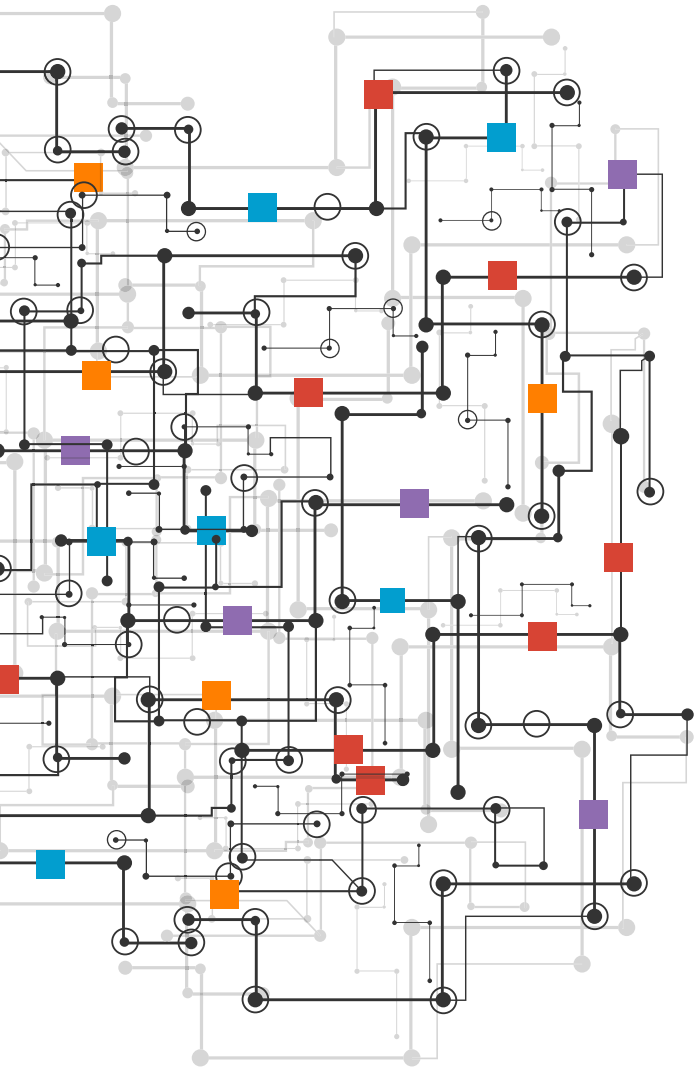
challenges that have contributed to making the accreditation implementation difficult. Unsurprisingly, the participants described that the COVID-19 pandemic had exacerbated the magnitude of these challenges.

At the policy level, assessing driving and restraining forces before adopting accreditation is crucial for long-term sustainability. When the number and significance of the restraining forces outweigh the drivers, accreditation programs become at risk of premature dissolution [62] and locomotion (i.e. movement towards the desired change) will not take place [181]. In this chapter, several restraints that could jeopardize the future of the national accreditation model were identified. These restrainers point to a serious challenge for standard implementation, which might explain why many hospitals failed to show a satisfactory level of compliance with accreditation standards. The lessons gleaned from this chapter contribute to the literature by identifying these forces and the interplay among them, providing a comparative view of national accreditation, and assisting in prioritizing efforts to ensure successful accreditation implementation in broader contexts, especially for countries planning to adopt accreditation schemes as a performance improvement strategy.

As to limitations, the inevitable recall bias in the qualitative approach may have biased the results in this chapter. However, reaching thematic saturation, deploying a methodological coding system, and adopting evidenced-based trustworthiness criteria could have helped in shaping the chapter conclusion and delineating results that are largely consistent with previous studies in the accreditation field. Examining the economic benefits of accreditation, exploring the resource requirements to overcome obstacles, and investigating the interplay between accreditation implementation and organizational culture are worthwhile future research avenues.

4.5 CONCLUSION

Accreditation success is determined by how we think, act, and react to standards. The contextual driving and restraining forces identified in this chapter may offer guidance in assessing accreditation readiness and advancing the institutionalization of accreditation standards. The force-field analysis framework provides a comprehensive picture of these forces, which may assist in developing and prioritizing suitable macro- and micro-strategies to strengthen drivers and weaken restrainers.



CHAPTER 5

THE SUSTAINABILITY OF HOSPITAL ACCREDITATION MODELS: A CROSS-SECTIONAL STUDY

EMBARGO

This chapter draws upon:

Hussein M, Pavlova M, Groot W. The sustainability of hospital accreditation models: A cross-sectional study. Submitted for publication

ABSTRACT

Background

Due to the rapid changes in the health sector, the sustainability of hospital accreditation is jeopardized despite its growing importance. This chapter aims to examine what improvements are important in enhancing the sustainability of the hospital accreditation model in Saudi Arabia.

Methods

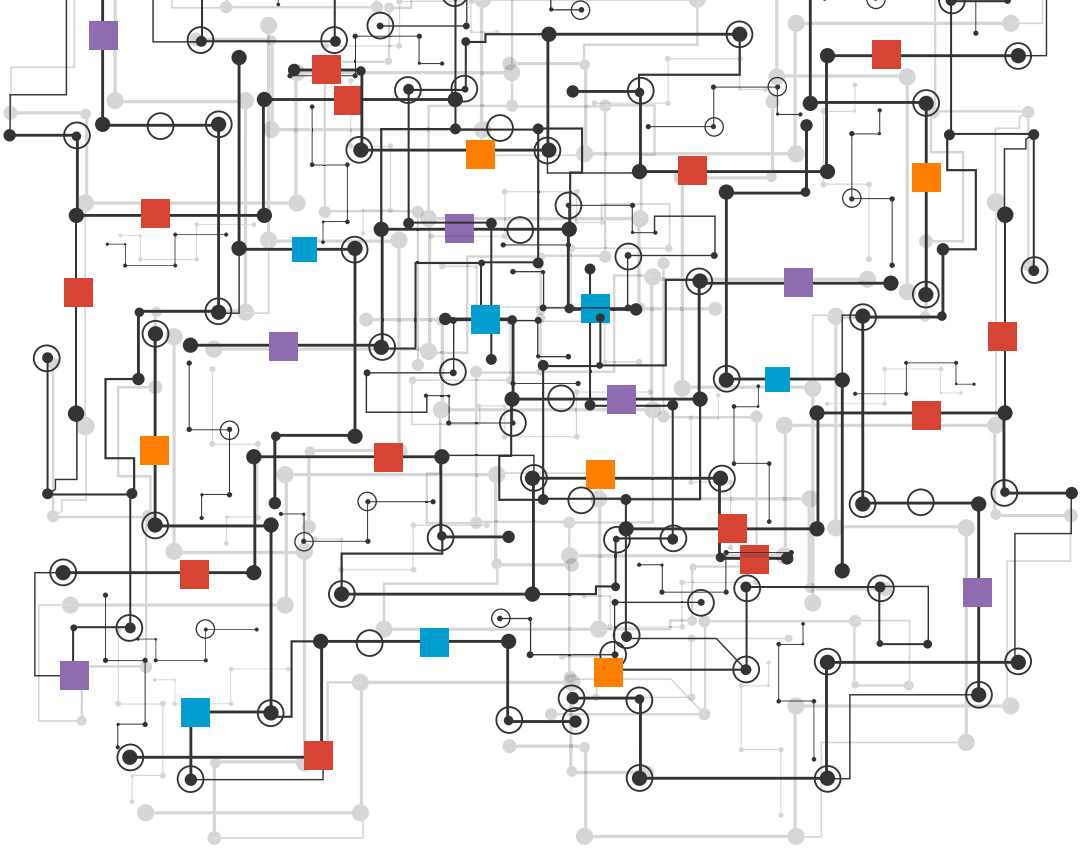
Quality managers in accredited Saudi Arabian hospitals were invited to participate in a cross-sectional survey from July to August 2022. A structured questionnaire was developed, tested, piloted, and validated using exploratory factor analysis. The respondents were asked to rate the importance of recommended improvements proposed to enhance the sustainability of accreditation policies, standards development, evaluation methods, and the evaluation teams on a 5-point Likert scale.

Results

In total, 158 valid questionnaires were included in the analysis. The overall mean importance attached to improving standards development, accreditation policies, evaluation teams, and evaluation methods were 3.55, 3.43, 3.41, and 3.21, respectively, on the 5-point scale. Among the most important perceived improvements were: shifting the focus of accreditation standards to outcomes and improvement, periodically updating standards, and integrating consumer perspectives in all accreditation aspects. Multivariate regression analysis revealed that managers with more years of experience had significantly higher importance scores for improving these accreditation aspects.

Conclusion

Improving accreditation aspects is important in enhancing the sustainability of hospital accreditation programs. This chapter offers insights to assist policymakers and other stakeholders to redesign traditional accreditation models to make them more sustainable, and that can supplement other performance improvement tools in improving healthcare quality.



CHAPTER 6

GENERAL DISCUSSION

6.1 INTRODUCTION

This dissertation has focused on hospital accreditation in Saudi Arabia. The central aim of the dissertation was to understand hospital accreditation in Saudi Arabia in order to leverage its prospects for improvement. A better understanding of the accreditation system assists in identifying opportunities for improvement, which may ultimately contribute to improving its sustainability. The dissertation offered answers to how accreditation programs affect the quality of service in hospitals in Saudi Arabia, what factors influenced the implementation of accreditation standards, how healthcare leaders perceived the implementation of accreditation standards, and what improvements are needed to sustain accreditation among other performance improvement tools in healthcare industries.

Chapter 1 of this dissertation provided an overview of the hospital accreditation approach, both internationally and nationally in Saudi Arabia. Furthermore, it offered a general overview of the impact of accreditation and the challenges associated with the implementation of accreditation standards in diverse contexts. In Chapter 2, the results of a systematic review of the evidence on the impact of hospital accreditation on the quality of healthcare services were presented. In this chapter, the impact of accreditation was explored from a variety of aspects and levels, including the impact at the organizational level, professional level, and patient level, as well as the impact on clinical health and economic outcomes. Thereafter, Chapter 3 explored, qualitatively, the attitude of Saudi Arabian hospital directors toward the national accreditation program and toward the processes through which accreditation standards were incorporated into the routine operations of their hospitals. At a wider national level, Chapter 4 examined the factors that influence the accreditation program in Saudi Arabian hospitals. This chapter categorized the factors that affect accreditation into driving and restraining factors, from within (i.e. internal) and outside (i.e. external) the hospital setting. To close the cycle, Chapter 5 analyzed the importance of a set of improvements that are needed to be considered in redesigning the traditional accreditation model into a more sustainable model that would ensure the relevance of accreditation in the future. In this chapter, the analysis was based on the perspective of quality managers in Saudi Arabian hospitals. Further, Chapter 5 built on earlier chapters and offered a road map to enhance the modernization and sustainability of the hospital accreditation model in Saudi Arabia.

In this final chapter (i.e. Chapter 6), the lessons learned from the literature review, qualitative research, and quantitative research in this dissertation are summarized and discussed using four key statements. These statements set the stage for the discussion within this dissertation and are based on the findings of the studies that have been conducted for this dissertation. Hence, the statements are arranged in a streamlined manner to inform readers, researchers, policymakers, and other stakeholders of what we previously knew, what we currently have, and what we should do to move forward in order to preserve the standing of hospital accreditation models among other performance improvement tools. The discussion of each statement includes the research findings that support the statement, the contextual interpretation within the national and international evidence, the relevant research and policy implications of the statement, and the topics of future research that would further enrich understating of these statements. Furthermore, this chapter is followed by a general conclusion of the dissertation.

It is important to note that the research results discussed here are specific to hospital accreditation programs in Saudi Arabia and may serve as an example of a mature accreditation model that confronts comparable motivators and hindrances as other international accreditation programs. This, however, may overlook some other aspects concerning hospital accreditation. Yet, the results reported in this dissertation and their implications are expected to be relevant to a wider scale of accreditation programs in broader contexts.

6.2 DISCUSSION OF STATEMENTS

Statement 1: Compliance with accreditation standards contributes to improving the quality and safety of healthcare services.

In healthcare, various internal and external approaches have been employed to promote the quality of services [4]. Accreditation, as an external strategic tool, has become an integral part of healthcare systems to improve service quality, particularly in the last two decades [8, 14, 28, 72]. As defined in Chapter 1, accreditation refers to the external evaluation of the compliance of healthcare organizations with pre-defined performance standards [6]. Several leading healthcare organizations view accreditation as a quality marker [8]. However, the evidence offered to support this assumption remains scant. As evidenced in Chapters 2 and 3, this is attributed to the

contextual heterogeneity of accreditation policies, the scarcity of high-quality studies on its value, and the substantial resources necessary to meet accreditation standards.

As reported in Chapter 2 of this dissertation, accreditation was found to have a positive effect on various aspects and measures of the healthcare quality system. Explicitly, consistent positive effects of accreditation were found on process-related quality measures, safety culture, hospital efficiency, and patient length of stay. In contrast, staff job stress was found to be negatively affected. Also, in agreement with previous reviews [8, 12], contradictory results concerning the impact of accreditation on mortality and healthcare-associated infection hampered the drawing of firm conclusions on those outcome measures in the review presented in Chapter 2. On the other hand, staff job satisfaction, patient satisfaction, and the 30-day readmission rate were found to be unrelated to accreditation. As stated in Chapter 2, the results should be interpreted in the context of their limitations due to the variability in the accreditation schemes, the diversity in hospital characteristics, and the inability to isolate extrinsic confounders that may influence the impact of accreditation on healthcare quality.

The findings in Chapter 2 confirmed the positive effect of accreditation on the safety culture in the organization. In return, the positive organizational culture influenced the progress of implementing accreditation standards, as evidenced in Chapter 3 for Saudi Arabia. Also, the organizational culture affects the degree to which frontline workers and leaders are engaged in the accreditation processes, as shown in Chapter 4. This bidirectional relationship between accreditation and organizational culture is consistent with the accreditation literature that has reported on cultural changes following accreditation [28, 35] and how a positive culture fosters the engagement of staff and leaders in the accreditation process, in return [9, 52, 58]. For instance, in a large cross-sectional study among 110 private hospitals in Lebanon regarding the worthiness of accreditation, around two-thirds of the participating hospitals perceived accreditation as a worthy investment due to its positive effect on enhancing the quality and safety culture [22].

In the same vein, the review in Chapter 2 confirmed that the favorable effect of hospital accreditation on performance measures appears before [32, 95], during [119], and post-accreditation [134, 144]. Nonetheless, this effect is cyclical, as evidenced in Chapter 2. In this, some hospitals experienced a sharp decline in performance following the accreditation visit, while some others sustained the

performance gains longer [34, 120, 136, 159]. Doubtless, the extent to which hospitals can maintain these gains is influenced by a diversity of factors. The findings for Saudi Arabia in Chapters 4 and 5 highlighted the important role of continuous accreditation readiness or "Getting Ready for Your Next Patient" as described by Valentine *et al.* [200] as a viable strategy in anchoring standards into daily operations, sustaining the change, and averting the crisis that unannounced surveys may cause.

On the contrary, the review of the evidence in Chapter 2 indicated the passive effect of accreditation on the stress level of hospital co-workers. This stress, indeed, was perceived by Saudi hospital directors as a key challenge that affects the process of integrating accreditation standards in daily operations, as evidenced in Chapter 3. This challenge may result in generating certain workarounds and mismatches between the actual practice and the evidence handed to the accreditation survey team. Also, such stress may influence the acceptance and participation of healthcare professionals in the accreditation journey [23, 154]. Hence, as argued in Chapter 2 and Chapter 3 of this dissertation, a balance between accreditation risks and benefits is necessary. Further, considering remedies, such as accreditation awareness campaigns, leadership support, and better design of accreditation standards, is vital to support co-workers throughout the accreditation process and weaken such negative consequences [155]. Important to note that these delineated findings are largely consistent with previous studies in the accreditation field in various contexts [98, 100-102].

As found in Chapter 3 of this dissertation, a sense of commitment to customers was perceived by Saudi hospital directors as the most motivating external factor for the engagement of staff and leaders in the accreditation process. This is consistent with the widely held belief that improved service quality leads to increased patient satisfaction [178]. However, the findings in Chapter 2 indicated a lack of a correlational link between accreditation and better patient satisfaction or experience. This is consistent with the findings of previous reviews [27, 28, 35]. As argued in Chapter 2, this finding is likely to be attributed to the current design of the hospital accreditation model, which continues to disregard the results of patient experience surveys in the accreditation decision matrix, in Saudi Arabia and other parts of the world [194]. This also lends credence to the findings presented in Chapter 5 of this dissertation. In particular, this chapter evidenced that quality managers of Saudi Arabian hospitals regarded "integrating patient

perspectives in all aspects of accreditation, including decisions" as one of the most important improvement changes required when redesigning the existing traditional accreditation model.

In conclusion, the advantages of accreditation outweigh the potential drawbacks. This dissertation supports the notion that adhering to accreditation standards has multiple benefits in terms of improving the quality of healthcare services and outcomes. As mentioned in Chapters 2, 3, and 4, introducing accreditation schemes continues to be a stimulant agent in promoting quality and patient safety initiatives.

Policy and research implications

Accreditation has become an indispensable part of healthcare quality systems. Early reviews on the impact of accreditation did not provide persuasive evidence of the effectiveness of accreditation. However, the systematic review, presented in Chapter 2, found evidence that accreditation has a positive impact on the quality of healthcare. In the review, most of the included studies were contextually heterogenous and observationally designed. Nonetheless, due to the impracticality of conducting randomized trials on complex health policy issues such as accreditation, observational studies appear to be of doubtless value.

Chapter 2 reported on the challenge of drawing a definitive conclusion regarding the impact of accreditation on economic outcomes due to the paucity of studies on this aspect. This was ascribed to the difficulties in isolating the financial impact of accreditation from other contextual considerations. Also, it was reported that accreditation and patient satisfaction are not correlated. As these two indices measure quality from different angles, this contradicts shared decision-making principles. Therefore, the researchers' focus should be directed toward conducting studies on assessing the economic outcomes of hospital accreditation to better understand whether accreditation benefits genuinely justify the costs. Also, more research is needed to explore the mechanisms through which the level of service quality becomes tangible from the perspective of patients. Furthermore, some studies have emphasized the gradual nature of quality improvement and the fact that repeated cycles of accreditation can result in improved healthcare. In accreditation, integrating and routinizing standards in daily business operations requires time. Hence, employing longitudinal studies might be quite beneficial in detecting causative conclusions on the impact of accreditation and enriching consequential decisions in this realm.

At the policy level, introducing hospital accreditation stimulates quality and patient safety, as shown in this dissertation. Policymakers, accreditors, and other stakeholders should exhort strategic efforts to align accreditation with other health policies, incentivize accreditation as a marker of quality, and modernize accreditation to facilitate institutionalizing the standards and sustain performance gains. Indeed, synchronizing accreditation with other health policies, supplements performance improvement tools in promoting healthcare quality.

Statement 2: Recognizing the mechanisms through which accreditation standards are integrated into operations is critical to understanding how accreditation works.

Accreditation serves as a powerful motivator that stimulates performance improvement in healthcare, complementing other quality improvement strategies as outlined in Chapter 2 [11]. The question of how accreditation works is multifaceted. The direct answer rests on the mechanisms through which accreditation standards are integrated into business operations. However, the integration *per se* is influenced by how stakeholders perceive and understand accreditation, as shown in Chapter 3 of this dissertation.

The research presented in Chapter 3 found that hospital directors expressed an overall positive attitude toward the hospital accreditation model in Saudi Arabia. This is consistent with the perception of stakeholders reported in other contexts [201]. For instance, three cross-sectional studies conducted in India, Iran, and Denmark to understand the perceptions toward their hospital accreditation programs concluded an overall positive attitude toward accreditation, particularly from the perspectives of hospital managers and administrators [31, 53, 63]. However, in accordance with the findings presented in Chapters 3 and 4, the favorable view of accreditation in Saudi Arabia was influenced by various factors, including the culture of the organization, the level of staff engagement in the process, teamwork, and the staff years of work experience. For instance, Saudi hospital directors with more years of experience or prior exposure to accreditation perceived accreditation more meaningfully, as shown in Chapter 3. Also, hospital quality managers with more years of experience were more likely to recognize the importance of introducing changes to the current hospital accreditation model in Saudi Arabia in order to enhance its relevancy and sustainability, as evidenced in Chapter 5.

The research results presented in Chapter 3 of this dissertation explained the mechanism of routinizing accreditation standards in the operations of Saudi hospitals. The mechanism was described as consisting of four sequential phases; understanding the standards (i.e. coherence), involving frontline staff and teams (i.e. cognitive participation), taking purposeful actions to integrate standards (i.e. collective actions), and evaluating the process to maintain the gains (i.e. reflexive monitoring). Chapter 3 also emphasized that the four phases are interlinked and interdependent in the Saudi Arabian health system, whereby progress in one phase expedites the process of normalizing the standards in daily practice.

As indicated in Chapter 3, hospital directors in Saudi Arabia, who understood the accreditation standards, were more likely to assume a leading role in the accreditation journey, particularly during the initial phase of accreditation. This supportive role was genuinely affected by the clarity of standards and the alignment of accreditation requirements with the hospital strategy. Indeed, this conclusion is consistent with the results of the quantitative study presented in Chapter 5, which underscored the importance of aligning accreditation standards with national health policies. Also, the finding is consistent with previous studies that underlined the importance of strengthening the alignment of accreditation standards with the regulations and the health system's strategic priorities [15, 57, 202]. Consequently, hospital directors used an influential approach to reduce in-hospital cultural resistance, encourage frontline workers to be involved in the accreditation process, and enhance teamwork within their hospitals, as shown in Chapter 3.

Explicitly, teamwork within Saudi hospitals was a key success factor in the process of integrating accreditation standards. This was evident and expressed clearly in the studies conducted in the context of Saudi Arabia and presented in Chapters 3 and 4. As demonstrated in Chapter 4, the hospital quality directors and hospital directors viewed teamwork as the most important driving factor that assisted hospitals in integrating accreditation standards. This finding is in agreement with those of studies that emphasized the vital role of teamwork in the accreditation process [52, 155].

In this dissertation, the findings presented in Chapters 3 and 4 complement each other. Chapter 3 indicated that the engagement of frontline workers in accreditation had a positive effect on the process of integrating accreditation standards, whereas Chapter 4 indicated more resistance to change and delay in standard integration

when the frontline workers disengaged from the accreditation process. However, engagement serves as a positive atmosphere in which to carry out the succeeding phases of standards integration. For the standards to be successfully integrated, a series of actions are required to be taken. The study presented in Chapter 3 for Saudi Arabia found that the hospital directors undertook several actions throughout the integration process, including the distribution of standard sets to relevant owners, conducting gap analysis, and developing a corrective plan accordingly. These actions were necessary to bridge the know-do gap and maintain positive change, subsequently. In the evaluation phase (i.e. after completing the accreditation survey), regularly tracking the performance helped the hospitals to learn from their successes, detect remaining performance gaps, and avoid a decline in performance.

In conclusion, the effectiveness of integrating accreditation standards depends initially on making sense of accreditation and understanding the mechanisms through which the standards are routinized into business operations. As evidenced in Chapters 3 and 4, normalizing accreditation standards in Saudi hospitals resulted in an enhanced organizational safety culture, team spirit, communication, public trust, and standardizing procedures. Hence, it is important to engage frontline staff in the accreditation process and encourage teamwork within the teams. Also, it is important to follow the integration of standards by a proper evaluation of the process to maintain performance gains. This dissertation supports the notion that routinizing accreditation standards successfully requires a collaborative approach from everyone in the organization through implementing a bundle of actions to fulfill the identified performance gaps.

Policy and research implications

The literature on the perception of stakeholders towards accreditation is varied. However, according to the qualitative perceptional study presented in Chapter 3 of this dissertation, the hospital directors in Saudi Arabia perceived national hospital accreditation favorably. The chapter reported on four phases through which Saudi hospitals normalized the accreditation standards in their business operations. Through these phases, staff engagement and teamwork played a crucial role in successful integration. However, it must be acknowledged that there is no consensus on a specific approach to optimize staff engagement in accreditation, but denying their role has the potential to keep them skeptical of participating. Hence, future research to examine strategies that consolidate staff engagement is

needed and important. Furthermore, a longitudinal investigation of changes in the attitudes of leaders toward accreditation through repeated accreditation cycles would also be beneficial.

At the policy level, the contextual lessons reported in this dissertation provide stakeholders and policymakers with evidence that assists them in making informed decisions on the integration of accreditation standards and the resources required alongside the process, as well as evaluating accreditation effectively. Although the findings represent the perception and accreditation process in Saudi Arabia, they are relevant to a broader context due to the similarity in hospital accreditation programs internationally.

Statement 3: Providing evidence on the factors affecting accreditation helps in assessing accreditation readiness and advancing the institutionalization of standards.

Standards are the key component of accreditation. Hospitals that use accreditation as a performance improvement tool abide by accreditation standards in order to improve their performance and outcomes, as indicated in Chapter 2 of this dissertation. The effectiveness of implementing hospital accreditation standards is influenced by familiarization with standards, leadership commitment, employing a teamwork approach, and involving the relevant individuals and teams in the standard integration process, as evidenced in Chapter 3. It is also crucial to note that genuine progress in incorporating standards into business operations is determined by the number and significance of challenges that hospitals confront during the integration process. In Saudi Arabia, numerous factors were found to affect the integration process positively and negatively, from inside and outside the hospital setting. Saudi hospitals appeared to be jammed in the middle of these factors, with some facilitating the integration process forward and others hindering the integration backward, as illustrated in Chapter 4. The successful approach in this situation is dependent on recognizing these influential factors, weakening hindrances, and strengthening motivators.

Chapter 4 of this dissertation investigated the opposing interactions between the driving and restraining factors that influenced the integration of accreditation standards in Saudi Arabia at a national scale. The findings presented in Chapter 4 indicated that teamwork, the mindset of hospital leaders and staff towards quality,

the use of a continuous readiness model, and staff dedication toward patients were the main driving factors that assisted Saudi hospitals in effectively implementing accreditation standards. As mentioned earlier in this chapter, teamwork was the most common motivating factor [52, 177]. This is partially explained by the wide spectrum of accreditation standards that address technical and non-technical requirements at the service level. These standards necessitate the participation of the service owners who are involved in service operations, have a better understanding of the technical standards, and are more capable of implementing them. In the Saudi context, involving the process owner in the accreditation assisted hospitals positively in integrating accreditation standards, as shown in Chapters 3 and 4.

Furthermore, the study presented in Chapter 4 found that adopting the continuous accreditation readiness approach facilitated timely standards integration. The continuous readiness approach emphasizes maintaining continual compliance with the standards to primarily ensure patient safety and fulfilling the requirements of the mandatory accreditation subsequently. Also, the investigation revealed that external driving factors from beyond the hospital boundaries supported the hospitals during the accreditation journeys. These external factors included public confidence in accreditation as a quality marker, the evidenced-based nature of accreditation standards, and the Saudi strategy for transforming to a value-based system. These findings are consistent with earlier studies in the accreditation field [135, 178].

On the other hand, insufficient manpower, infrastructural gaps, workforce recruitment challenges, variability among surveyors, the pandemic situation of COVID-19, limited financial support, and bureaucratic decision-making procedures were the main challenges experienced by Saudi Arabian hospitals when integrating accreditation standards, as presented in Chapter 4. Although the extent of these restraining factors varied amongst Saudi hospitals, it was somewhat comparable, more or less, to what has been identified in other contexts internationally [9]. For instance, the infrastructural gap that was faced by Saudi Arabian hospitals was also listed as one of the main challenges in various low- and middle-income countries [54, 55]. Also, the evidence presented in Chapter 4 lends credence to previous studies that reported workforce insufficiency, low levels of physician engagement, and limited financial support as challenges experienced in their respective contexts [10, 53, 179]. For instance, in a cross-sectional study that included seven hospitals in Iran, Tashayoei *et al.* reported the shortage of staff as one of the key challenges to the hospital accreditation model [10].

From another angle, largely consistent with the accreditation literature [10, 56, 57, 62, 179], Chapter 4 identified various challenges directly related to the design of the accreditation model, such as the cost of the accreditation visit, standard irrelevancy, and lack of inter-surveyor reliability. The latter was frequently emphasized by the hospital directors and the hospital quality managers in Saudi Arabia, as shown in Chapters 3 and 4. On a broader view, given the fact that most of these challenges were reported in settings where the accreditation systems are voluntary, experiencing these challenges collectively in the Saudi context raises a consideration flag to policymakers and other stakeholders, especially because the accreditation system in Saudi Arabia is mandatory and its outcome is linked to the reimbursement system. Important to mention that the hospital quality directors in Saudi Arabia did not perceive mandating accreditation as an important approach to support accreditation sustainability, as indicated in Chapter 5 of this dissertation.

In conclusion, recognizing factors that influence the process of integrating accreditation standards helps in determining the readiness of hospitals to pursue accreditation. In Saudi Arabia, numerous driving and restraining forces that affect integrating hospital accreditation standards have been identified. The overall picture of these factors at the national level presented an equilibrium state based on the number and significance of the counteracting enablers and challenges. The research evidence presented in Chapter 4 of this dissertation supports the notion that having an equilibrium state between the counteracting forces suggests that the current hospital accreditation model in Saudi Arabia is faced with serious challenges that hinder its sustainability. Hence, these factors should be addressed seriously at all levels to increase the likelihood of institutionalizing accreditation standards.

Policy and research implications

Incorporating accreditation standards into everyday hospital operations necessitates reframing the current hospital processes to be aligned with the accreditation standards in order to shrink performance gaps and enhance service quality, subsequently. This integration is impacted by a variety of enablers that facilitate and challenges that impede the integration. The study presented in Chapter 4 of this dissertation provides evidence of the factors affecting the integration of hospital accreditation standards in Saudi Arabia. The balanced state seen among these opposing factors jeopardize the future of the national hospital accreditation program. Hence, future research to examine the resources required to overcome

accreditation challenges would be beneficial to enhance the sustainability of hospital accreditation. Furthermore, an objective evaluation study on the vital few factors that account for the bulk of the effect will assist policymakers and stakeholders in prioritizing the efforts to reduce identified challenges.

At the policy level, the driving and restraining factors identified and presented in Chapter 4 help policymakers, accreditors, and stakeholders in assessing accreditation readiness, prioritizing accreditation efforts and budget allocation, considering changes to the current accreditation model, and making informed decisions on how to strengthen drivers and weaken restrainers at the macro– and micro-levels, which eventually promote institutionalizing accreditation standards in daily operations. Factors affecting accreditation standards integration are sensitive to the context in which they are applied. Therefore, a challenge in one context may serve as an enabler in another. The findings shown in Chapter 4 represented the factors affecting accreditation in Saudi Arabia. However, the comprehensiveness of the findings would allow for lessons to be gained in a broader context, particularly in countries planning to deploy accreditation as a performance improvement tool in their quality improvement system. Furthermore, the findings provide evidence on accreditation challenges which help other accrediting bodies facing comparable challenges to improve the long-term sustainability of such programs.

Statement 4: Improving the features of hospital accreditation contributes to sustaining accreditation and preserving its future relevance.

Every healthcare system has a unique *modus operandi* for enhancing service quality. Globally, several internal and external tools have been adopted to improve healthcare quality and performance. In this, accreditation has reserved its privileged position among performance improvement tools since its inception a century ago [13]. This position, unsurprisingly, has grown over the last two decades as more countries adopted or adapted accreditation in their health systems [28]. As evidenced in Chapter 2 of this dissertation, accreditation programs are no longer in a defensive position to defend their undeniable effects. Nevertheless, the persisting restraining forces that hamper the integration of hospital accreditation standards in Saudi Arabia, impose the necessity of introducing improvements to the current accreditation model, as discussed in Chapter 4. In addition, the pace with which Saudi healthcare systems are evolving in the digital age adds to the necessity of making such changes. Failure to change is anticipated to undermine the sustainability and future relevance of

accreditation in Saudi Arabia, and the program becomes at risk of going the way of the dinosaur, as described by Nicklin et al. [11].

In addition to the systemic internal and external challenges, Chapter 4 of this dissertation highlighted various challenges directly related to the design of the accreditation system in Saudi Arabia. Qualitatively, Saudi hospital directors described the mechanism through which accreditation standards are integrated with hospital business operations, as shown in Chapter 3. These mechanisms clarified the areas of concern in the current hospital accreditation scheme in Saudi Arabia. Furthermore, Chapter 5 of this dissertation indicated, from the perspectives of quality managers in Saudi hospitals, the importance of introducing several improvements to the hospital accreditation model in Saudi Arabia in order to enhance its sustainability and future relevance. These improvements addressed several accreditation-related aspects, including changes in accreditation policies, standards development processes, evaluation methods, and evaluation teams.

At the hospital level, staff commitment to a patient-centeredness approach was an enabling factor that encouraged staff engagement in accreditation, as evidenced in Chapter 4. However, patient-centeredness needs to be taken into consideration as early as drafting the accreditation standards. In Saudi Arabia, the study findings presented in Chapter 5 indicated the importance of considering patient perspectives in all accreditation aspects, including accreditation decisions. This might be attributed to underestimating the results of patient satisfaction surveys in the accreditation decisions, nationally and internationally [194], and the disassociation between accreditation outcomes and patient satisfaction. Previous studies that analyzed patient satisfaction in accredited hospitals did not detect improvements in patient satisfaction after achieving "accredited" status [20, 109, 110, 117]. For instance, in a large comparative study conducted in Germany to assess the relationship between patient satisfaction and accreditation status, Sack *et al*. reported no discernible difference between accredited and non-accredited hospitals in terms of patient satisfaction [117].

Also, the findings in Chapter 5 emphasized the importance of shifting the focus of accreditation standards to outcomes and improvements, as viewed by quality managers in Saudi hospitals. This finding is consistent with studies that ascribed the uncertainty of accreditation outcomes to its structural nature [57]. Despite the fact that hospital accreditation standards in Saudi Arabia have been revised

periodically, the standards mainly aim at maintaining a robust structure and processes that enable achieving desirable outcomes. Notwithstanding, the weight of outcome standards compared to structural and process standards is almost negligible. To illustrate, if a hospital is equipped with the required hand hygiene supplies and has a written policy addressing the hand hygiene processes, the standard concerning hand hygiene is deemed to be in full compliance, despite the rate of healthcare-associated infection. This partially explains the lack of correlation between accreditation status and health outcomes such as mortality and healthcare-associated infection, as evidenced in the systematic review presented in Chapter 2.

Traditionally, accreditation surveys are the means to evaluate the performance of hospitals pursuing national accreditation in Saudi Arabia. In this context, the snapshot evaluation is commonly used to assess compliance with accreditation standards. However, given the fact that performance is a continuous process of reviewing, measuring, and managing operations continuously, the reliability of snapshot evaluation calls into doubt [40, 135]. In the study presented in Chapter 3, Saudi hospital directors questioned the capacity of snapshot evaluation to reflect actual performance. This finding was in agreement with the findings presented in Chapter 5, in which the hospital quality manager in Saudi Arabia emphasized the importance of replacing snapshot evaluation with continuous monitoring of standard compliance in order to enhance the sustainability of the hospital accreditation model. Similarly, an early study suggested using clinical indicators in accreditation evaluation to improve the evaluation process [203].

From another view, the results presented in Chapter 5 emphasized the importance of introducing multiple initiatives to all aspects of accreditation, including the survey team. The results indicated that using rigorous selection criteria for recruiting surveyors, effectively training surveyors on accreditation standards, and reducing the variations among survey teams were perceived as important improvements required to enhance the sustainability of accreditation. The latter was also mentioned in Chapter 3 of this dissertation as a contributing factor to stakeholder disengagement with accreditation. It is also consistent with the results of previous studies in other contexts [10, 53, 56, 57].

In conclusion, now more than ever, accrediting bodies need to establish innovative initiatives to preserve the position of accreditation as a reliable quality improvement tool. Although the accreditation literature does not specify the

practical steps in reframing the current accreditation model, the findings presented in Chapter 5 highlighted the importance of introducing a set of improvements in terms of accreditation policies, standards development, evaluation methods, and evaluation teams to enhance the sustainability and future relevance of the hospital accreditation model in Saudi Arabia, particularly due the challenges the current model is experiencing.

Policy and research implications

The challenges associated with hospital accreditation in Saudi Arabia cast doubt on the sustainability of the program. In fact, comparable challenges resulted in abandoning accreditation in other contexts [30, 59]. Sustaining hospital accreditation programs requires reframing the current model while addressing the influencing challenges. Chapter 5 provided evidence on recommended improvements that are important for redesigning the current accreditation model in Saudi Arabia to enhance its sustainability. Indeed, these improvements include introducing changes in the accreditation policy, standards development, survey evaluation, and the survey team. However, it should be acknowledged that the study was limited to Saudi Arabia and solicited only the opinions of the quality managers in Saudi hospitals. Hence, conducting similar studies in other contexts will assist accrediting bodies in producing an enhanced sensible version of the accreditation that promotes value while weakening challenges. Also, it is important to seek the perceptions of other stakeholders involved in the accreditation process, as this will help in shaping the future of hospital accreditation models.

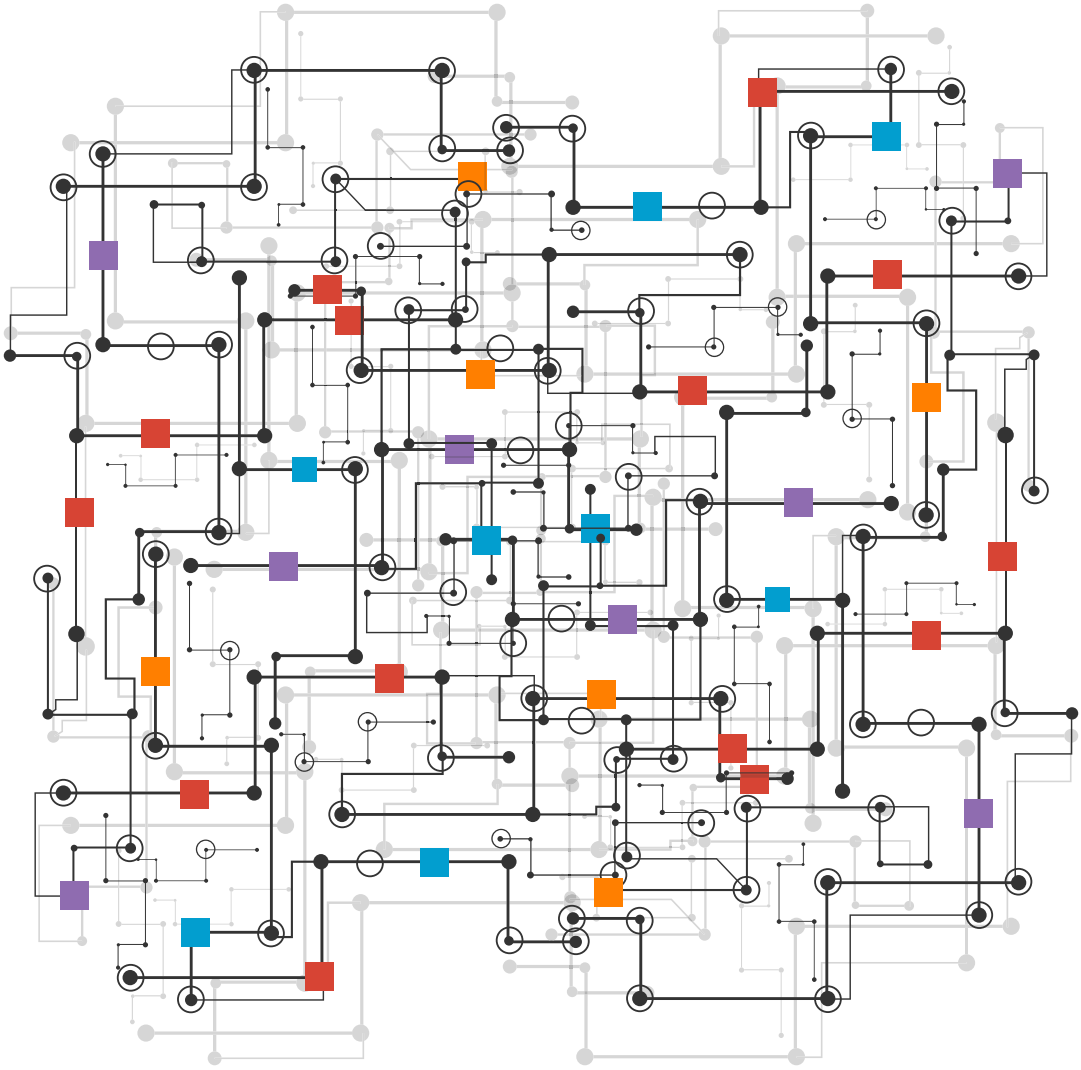
At the policy level, although Chapter 5 represents the perceived importance of a set of improvements in the Saudi context, the lessons learned from these findings are relevant to and demonstrate multiple implications on a larger contextual scale. Chapter 5 offers insights to assist researchers, policymakers, accreditors, and other stakeholders, internationally and nationally in Saudi Arabia, to better understand the changes important in redesigning the traditional accreditation models to make accreditation more sustainable and preserve its future relevance among other quality improvement strategies. The chapter also offers a clear map of how accreditation should appear in the future.

GENERAL CONCLUSION

This dissertation has explored the working mechanism and the factors influencing the hospital accreditation system in Saudi Arabia, and therefore leveraging its prospects for improvement. The overall findings on the impact of accreditation indicated that compliance with accreditation standards offers numerous advantages in improving the quality of healthcare services, including process-related quality measures, safety culture, hospital efficiency, and patient length of stay. It should be acknowledged, however, that synchronizing accreditation with other health policies further complements and promotes healthcare quality.

As evidenced in this dissertation, accreditation stimulates performance improvement by integrating standards into hospital business operations. In the Saudi context, various enablers and hindrances influence the mechanism through which hospital accreditation standards are integrated. This dissertation identified and illustrated these competing factors, from the perspectives of hospital directors and hospital quality managers in Saudi Arabia. The overall picture of these factors indicated that the Saudi hospital accreditation system is hampered by a large number of challenges that have a direct influence on the integration process, which places the sustainability of accreditation at risk. Hence, making meaningful improvements to strengthen enablers and weaken restrainers is crucial.

Furthermore, this dissertation presents policymakers, accreditors, and stakeholders in Saudi Arabia with evidence of improvements that are important to consider when restructuring the accreditation system. These improvements are anticipated to promote the strategic position of accreditation as a quality tool, reduce the affecting challenges, and enhance the sustainability and future relevance of hospital accreditation. It is worth mentioning that the implications of this dissertation are relevant to a larger contextual scale due to the similarities between accreditation programs and the factors affecting them.



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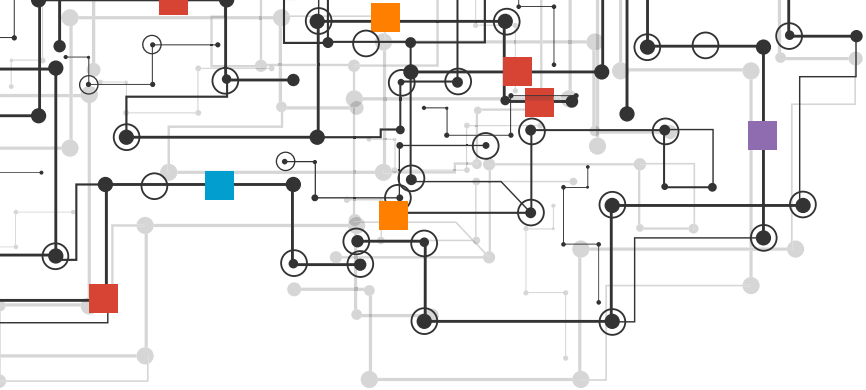


APPENDICES

APPENDICES A:
ADDITIONAL INFORMATION FOR CHAPTER 2

APPENDIX A1: Database Search Strategies

PubMed Search

- Searched via PubMed - NCBI (https://www.ncbi.nlm.nih.gov/pubmed/).
- Searched on 18 February 2020.
- Records retrieved: 10921

((("accreditation" [MeSH Terms] OR "accreditation" [All Fields] OR "accrediting" [All Fields] OR "accredits" [All Fields] OR "accredit" [All Fields] OR "accredited" [All Fields] OR "accreditations" [All Fields] OR "Joint Commission on Accreditation of Healthcare Organizations" [MeSH Terms] OR "joint commission on accreditation of healthcare organizations" [All Fields] OR "Joint Commission on Accreditation of Hospitals" [All Fields] OR "JCAHO" [All Fields]) **AND** ("hospitals" [MeSH Terms] OR "hospitals" [All Fields] OR "hospital" [All Fields] OR "center" [All Fields] OR "centre" [All Fields] OR "centers" [All Fields] OR "centres" [All Fields] OR "facility" [All Fields] OR "facilities" [All Fields] OR "health organizations" [All Fields] OR "healthcare organizations" [All Fields])) **AND** ("quality of health care" [MeSH Terms] OR "quality of health care" [All Fields] OR "quality" [All Fields] OR "quality improvement" [MeSH Terms] OR "quality improvement" [All Fields] OR "health services" [MeSH Terms] OR "health services" [All Fields] OR "health service" [All Fields] OR "healthcare service" [All Fields] OR "healthcare services" [All Fields] OR "health care service" [All Fields] OR "health care services" [All Fields] OR "quality assurance, health care" [MeSH Terms] OR "quality assurance, health care" [All Fields] OR "performance indicator" [All Fields] OR "performance measure" [All Fields] OR "benchmarking" [MeSH Terms] OR " benchmarking" [All Fields] OR "patient safety" [MeSH Terms] OR "patient safety" [All Fields] OR "delivery of health care" [MeSH Terms] OR "delivery of health care" [All Fields] OR "delivery of healthcare" [All Fields] OR "affect" [MeSH Terms] OR "affect" [All Fields] OR "effect" [All Fields] OR "Impact" [All Fields] OR "value" [All Fields] OR "influence" [All Fields] OR "change" [All Fields] OR "achieve" [All Fields] OR "induce" [All Fields] OR "improve" [All Fields] OR "progress" [All Fields] OR "increase" [All Fields] OR "help" [All Fields] OR "positive" [All Fields] OR "develop" [All Fields] OR "better" [All Fields] OR "advance" [All Fields] OR "raise" [All Fields] OR "rise" [All Fields] OR "enhance" [All Fields] OR "reinforce" [All Fields] OR "decrease" [All Fields]

OR “negative” [All Fields] OR “reduce” [All Fields] OR “reduction” [All Fields] OR “evaluate” [All Fields] OR “evaluation” [All Fields] OR “assess” [All Fields] OR “association” [MeSH Terms] OR “association” [All Fields] OR “relationship” [All Fields] OR “perception” [MeSH Terms] OR “perception” [All Fields] OR “outcome” [All Fields] OR “result” [All Fields] OR “satisfaction” [All Fields] OR “mortality” [MeSH Terms] OR “mortality” [All Fields] OR “morbidity” [MeSH Terms] OR “morbidity” [All Fields] OR “infections” [MeSH Terms] OR “infections” [All Fields] OR “infection” [All Fields] OR “cost” [All Fields] OR “amount” [All Fields])) AND “loattrfull text”[sb] **AND** (“2000/01/01”[PDAT] : “2020/02/18”[PDAT])

PubMed Search		
Number	**Query**	**Items found**
#97	(#96 AND “2000/01/01”[PDAT] : “2020/02/18”[PDAT])	10921
#96	(#95 AND “loattrfull text”[sb])	12612
#95	(#93 AND #94)	20533
#94	(#12 AND #24)	21095
#93	(#25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67 OR #68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78 OR #79 OR #80 OR #81 OR #82 OR #83 OR #84 OR #85 OR #86 OR #87 OR #88 OR #89 OR #90 OR #91 OR #92)	19570769
#92	“amount”	456376
#91	“cost”	507909
#90	“infection”	1185251
#89	“infections”	1227804
#88	“infections” [MeSH Terms]	2553387
#87	“morbidity”	373844
#86	“morbidity” [MeSH Terms]	540961
#85	“mortality”	1112437
#84	“mortality” [MeSH Terms]	373200
#83	“satisfaction”	198590
#82	“result”	1031568
#81	“outcome”	1853562
#80	“perception”	354316
#79	“perception” [MeSH Terms]	422892
#78	“relationship”	1570896
#77	“association”	1181565
#76	“association” [MeSH Terms]	13930
#75	“assess”	976277
#74	“evaluation”	1651379
#73	“evaluate”	1147959
#72	“reduction”	1169478

PubMed Search		
Number	**Query**	**Items found**
#71	"reduce"	631918
#70	"negative"	1062041
#69	"decrease"	921369
#68	"reinforce"	20315
#67	"enhance"	322306
#66	"rise"	241971
#65	"raise"	62281
#64	"advance"	80772
#63	"better"	939723
#62	"develop"	547934
#61	"positive"	1584415
#60	"help"	507877
#59	"increase"	2000500
#58	"progress"	244645
#57	"improve"	826509
#56	"induce"	425393
#55	"achieve"	275368
#54	"change"	1078363
#53	"influence"	1003326
#52	"value"	1103320
#51	"Impact"	931314
#50	"effect"	3219094
#49	"affect"	679752
#48	"affect" [MeSH Terms]	32649
#47	"delivery of healthcare"	685
#46	"delivery of health care"	106756
#45	"delivery of health care" [MeSH Terms]	1053699
#44	"patient safety"	45153
#43	"patient safety" [MeSH Terms]	19027
#42	"benchmarking"	18539
#41	"benchmarking" [MeSH Terms]	13064
#40	"performance measure"	1811
#39	"performance indicator"	669
#38	"quality assurance, health care"	55567
#37	"quality assurance, health care" [MeSH Terms]	322401
#36	"health care services"	14496
#35	"health care service"	2184
#34	"healthcare services"	8367
#33	"healthcare service"	1694
#32	"health service"	72327
#31	"health services"	449705
#30	"health services" [MeSH Terms]	2090027
#29	"quality improvement"	51990
#28	"quality improvement" [MeSH Terms]	23988
#27	"quality"	1186046

PubMed Search		
Number	**Query**	**Items found**
#26	"quality of health care"	74500
#25	"quality of health care" [MeSH Terms]	6783666
#24	(#13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23)	8676996
#23	"healthcare organizations"	11047
#22	"health organizations"	2277
#21	"facilities"	148741
#20	"facility"	130035
#19	"centres"	69312
#18	"centers"	337488
#17	"centre"	1332088
#16	"center"	3556422
#15	"hospital"	4637033
#14	"hospitals"	543591
#13	"hospitals" [MeSH Terms]	269793
#12	(#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11)	34242
#11	"JCAHO"	1380
#10	"Joint Commission on Accreditation of Hospitals"	133
#9	"joint commission on accreditation of healthcare organizations"	7823
#8	"Joint Commission on Accreditation of Healthcare Organizations" [MeSH Terms]	7449
#7	"accreditations"	77
#6	"accredited"	7907
#5	"accredit"	237
#4	"accredits"	91
#3	"accrediting"	923
#2	"accreditation"	28232
#1	"accreditation" [MeSH Terms]	18685

Cumulative Index to Nursing and Allied Health Literature (CINAHL)

- Searched via EBSCOhost (http://www.ebscohost.com/)
- Searched on 18 February 2020.
- Records retrieved: 2050 … *all results (2050) were from academic journals.*

CINAHL Search		
Number	**Query**	**Results**
S43	S42 Limiters – Academic Journals	2,050
S42	S41 Limiters – Research Article	2,195
S41	S38 AND S39 Limiters - Published Date: 2000/01-2020/02	9,927
S40	S38 AND S39	10,961
S39	S5 AND S20	14,685
S38	S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37	3,406,473
S37	TI "assess*" OR AB "assess*" OR TI "association" OR AB "association" OR TI "relation*" OR AB "relation*" OR TI "satisfaction" OR AB "satisfaction" OR TI "cost" OR AB "cost" OR TI "result*" OR AB "result*"	2,011,637
S36	(MH "Outcomes (Health Care)")	47,601
S35	TI "decrease" OR AB "decrease" OR TI "negative" OR AB "negative" OR TI "reduce" OR AB "reduce" OR TI "reduction" OR AB "reduction"	508,069
S34	TI "induce" OR AB "induce" OR TI "improve" OR AB "improve" OR TI "progress" OR AB "progress" OR TI "increase" OR AB "increase" OR TI "help" OR AB "help" OR TI "positive" OR AB "positive" OR TI "develop" OR AB "develop" OR TI "better" OR AB "better" OR TI "advance" OR AB "advance" OR TI "raise" OR AB "raise" OR TI "rise" OR AB "rise" OR TI "enhance" OR AB "enhance" OR TI "reinforce" OR AB "reinforce"	1,155,649
S33	TI "Impact" OR AB "Impact" OR TI "value" OR AB "value" OR TI "influence" OR AB "influence" OR TI "change" OR AB "change" OR TI "achieve" OR AB "achieve"	753,784
S32	(MH "affect") OR (MH "evaluation") OR (MH "perception") OR (MH "mortality") OR (MH "morbidity") OR (MH "infection")	88,903
S31	TX health* N2 delivery	71,091
S30	(MH "health care delivery")	46,741
S29	TX health* N2 service*	560,360
S28	TX "performance indicator*" OR "performance measure*" OR benchmark*	20,564
S27	TI "quality" OR AB "quality"	320,743
S26	(MH "health services")	12,225
S25	(MH "quality assessment")	7,346
S24	(MH "quality assurance")	19,499
S23	(MH "patient safety+")	110,458
S22	(MH "quality improvement+")	58,537
S21	(MH "quality of health care+")	709,370
S20	S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19	2,211,610
S19	TI ((university or academic) N2 medical N2 (city OR center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB ((university or academic) N2 medical N2 (city OR center OR centers OR centre OR centres OR institute* OR facilit*))	10,206
S18	TI ((cancer or oncology) N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB ((cancer or oncology) N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	14,596

CINAHL Search		
Number	**Query**	**Results**
S17	TI ((cardiac or heart or cardio*) N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB ((cardiac or heart or cardio*) N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	2,662
S16	TI (stroke N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB (stroke N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	3,811
S15	TI (rehabilitation N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB (rehabilitation N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	5,929
S14	TI ((mental or psychiatry*) N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB ((mental or psychiatry*) N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	3,066
S13	TI (("long term" or geriatric) N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB (("long term" or geriatric) N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	5,783
S12	TI (p#ediatric N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB (p#ediatric N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	3,297
S11	TI (trauma N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB (trauma N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	8,146
S10	TI (birth* N2 (center or centers or centre or centres or institute* or facilit*)) OR AB (birth* N2 (center or centers or centre or centres or institute* or facilit*))	1,514
S9	TX ("health* facilit*") OR "facilities" OR ("health* organization*") OR "facility"	164,707
S8	TX "center" OR "centers" OR "centre" OR "centres"	1,106,616
S7	TX "hospital" OR "hospitals"	1,385,400
S6	(MH "Hospitals+")	105,846
S5	S1 OR S2 OR S3 OR S4	30,605
S4	TX ("Joint Commission on Accreditation of Healthcare Organizations") OR ("Joint Commission on Accreditation of Hospitals") OR "JCAHO"	4,865
S3	(MH "Joint Commission")	8,515
S2	TX "accredit*"	24,265
S1	(MH "accreditation+")	17,397

PsycINFO Search

- Searched via EBSCOhost (www.ebscohost.com/).
- Date range searched: January 2000 to February 2020.
- Searched on 18 February 2020.
- Records retrieved: 1729 *... all results (1729) were from academic journals.*

PsycINFO Search		
Number	**Query**	**Results**
S45	S8 AND S14 AND S42 **Limiters** - Publication Year: 2000-2020; Published Date: 2000/01/01-2020/02/31; **Limiters** - Publication Type: All Journals, Peer Reviewed Journal, Peer-Reviewed Status-Unknown; Exclude Dissertations **Expanders** - Apply equivalent subjects	1,729
S44	S8 AND S14 AND S42	2,362
S43	S8 AND S14	2,598
S42	S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41	3,546,324
S41	TI "assess*" OR AB "assess*" OR TI "association" OR AB "association" OR TI "relation*" OR AB "relation*" OR TI "satisfaction" OR AB "satisfaction" OR TI "cost" OR AB "cost" OR TI "result*" OR AB "result*"	2,622,202
S40	TX "outcome"	234,392
S39	DE "Satisfaction" OR DE "Client Satisfaction" OR DE "Consumer Satisfaction" OR DE "Job Satisfaction" OR DE "Life Satisfaction" OR DE "Need Satisfaction" OR DE "Role Satisfaction"	53,738
S38	DE "Achievement" OR DE "Perception"	50,154
S37	TI "Impact" OR AB "Impact" OR TI "value*" OR AB "value*" OR TI "influence" OR AB "influence" OR TI "achieve*" OR AB "achieve*" OR TI "affect" OR AB "affect" OR TI "infection" OR AB "infection"	1,151,719
S36	TI "decrease" OR AB "decrease" OR TI "negative" OR AB "negative" OR TI "reduce" OR AB "reduce" OR TI "reduction" OR AB "reduction" OR TI "help" OR AB "help" OR TI "positive" OR AB "positive" OR TI "develop" OR AB "develop" OR TI "better" OR AB "better" OR TI "advance" OR AB "advance" OR TI "raise" OR AB "raise" OR TI "rise" OR AB "rise" OR TI "enhance" OR AB "enhance" OR TI "reinforce" OR AB "reinforce"	1,306,326
S35	TI "induce" OR AB "induce" OR TI "improve" OR AB "improve" OR TI "progress" OR AB "progress" OR TI "increase" OR AB "increase"	492,128
S34	SU "morbidity"	8,278
S33	TX "performance indicator*" OR "performance measure*" OR "benchmark*"	17,613
S32	SU "Organi*ational Change"	10,012
S31	DE "Mortality Rate" OR DE "Mortality Risk"	7,369
S30	DE "Evaluation" OR DE "Clinical Audits" OR DE "Program Evaluation" OR DE "Risk Assessment"	66,688
S29	SU Evaluation	144,598
S28	DE "Health Care Services" OR DE "Continuum of Care" OR DE "Health Care Delivery" OR DE "Hospital Programs" OR DE "Long Term Care" OR DE "Mental Health Services" OR DE "Palliative Care"	115,768
S27	DE "Health Care Delivery" OR DE "Health Care Access" OR DE "Health Care Costs" OR DE "Health Care Reform" OR DE "Health Care Utilization" OR DE "Managed Care"	49,462

PsycINFO Search		
Number	**Query**	**Results**
S26	SU "Health Care Delivery"	20,717
S25	TI quality OR AB quality	248,014
S24	SU "health care services"	44,471
S23	TX "quality assurance"	5,264
S22	SU "Patient Safety"	2,839
S21	SU "Quality control"	2,195
S20	SU "Quality of service"	213
S19	TX "quality improvement"	5,884
S18	SU "Quality of Care"	13,472
S17	TX "quality of health care" or "quality of care" or "healthcare quality"	25,977
S16	TX quality of health care	19,515
S15	DE "Quality Control" OR DE "Quality of Care" OR DE "Quality of Services"	20,766
S14	S9 OR S10 OR S11 OR S12 OR S13	1,067,918
S13	TX "health* facilit*" OR "facilities" OR "health* organization*" OR "facility"	65,146
S12	TI ((mental or psychiatry*) N2 (center OR centers OR centre OR centres OR institute* OR facilit*)) OR AB ((mental or psychiatry*) N2 (center OR centers OR centre OR centres OR institute* OR facilit*))	11,390
S11	TX center* OR centre*	737,582
S10	TX "hospital*"	449,902
S9	DE "Hospitals" OR DE "Psychiatric Hospitals"	23,326
S8	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7	8,304
S7	TX JCAHO	76
S6	TX "Joint Commission on Accreditation of Healthcare Organi*ations"	137
S5	SU "hospital accreditation"	107
S4	TX "Joint Commission"	562
S3	TX accredit*	7,987
S2	TX accreditation	5,241
S1	SU accreditation	1,938

EMBASE 1974 to 2020 Week 07

- Searched via Ovid (http://ovidsp.ovid.com/).
- Date range searched: 2000 to current.
- Searched on 18 February 2020.
- Records retrieved: 3316

EMBASE Search		
Number	**Searches**	**Results**
1	exp accreditation/	60645
2	accreditation$1.mp.	42604
3	accredit$.tw.	30170
4	(joint commission or joint commission on accreditation of hospital$1 or joint commission on accreditation of healthcare organi#ations or jcaho or jcia).mp.	5747
5	or/1-4	78917
6	exp hospital/	1094146
7	hospital$1.mp.	2210382
8	(center$1 or centre$1).mp.	1339390
9	healthcare organi#ation$.tw.	6793
10	health$ institution$.mp.	6853
11	exp health care facility/	1480729
12	health$ facilit$.tw.	23106
13	((university or academic) adj medical adj (city or center$1 or centre$1 or health facilit$)).tw.	35347
14	((cancer or oncology) adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	79556
15	((cardiac or heart or cardio$) adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	18603
16	(stroke adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	6394
17	(rehabilitation adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	15818
18	((mental or psychiatry$2) adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	10502
19	((long term or geriatric) adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	13740
20	(p?ediatric adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	14622
21	(trauma adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	21895
22	(birth$ adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	2298
23	or/6-22	3687282
24	exp health care quality/	3108457
25	(quality of health care or health care quality).mp.	242265
26	exp total quality management/	62115
27	total quality management.mp.	62717
28	quality improve$.mp.	58561
29	quality control/ or quality of life/	629064
30	health$ service$1.mp.	557756
31	quality of service$.mp.	7811
32	quality assurance, health care.mp.	189
33	quality assurance.tw.	35962
34	quality indicator$.tw.	11748
35	quality measure$.tw.	10479
36	performance indicator$1.tw.	5178

EMBASE Search		
Number	**Searches**	**Results**
37	bench?mark$.tw.	47106
38	patient safety.mp. or exp patient safety/	135557
39	exp health care delivery/	3139292
40	(delivery of health care or health care delivery).mp.	178113
41	exp satisfaction/	230680
42	satisfaction.mp. or job satisfaction/ or patient satisfaction/	276759
43	exp mortality/	1038794
44	mortality risk/ or mortality.mp. or mortality rate/	1419649
45	morbidity.mp. or exp morbidity/	644247
46	infection/ or infection rate/ or infection.mp.	2259910
47	(impact or affect or value or outcome$1 or perception$1).mp.	6481956
48	exp health personnel attitude/	179453
49	(influence or effect or change or result or cost or evaluat$ or “assess” or association or relation$).tw.	14722150
50	(decrease or negative or reduce or reduction).tw.	4338861
51	(achieve$ or induce$1 or improve$ or progress or increase or help or positive or develop$ or better or advance$ or raise or rise or enhance$ or reinforce).tw.	14981588
52	or/24-51	24060984
53	5 and 23	29868
54	52 and 53	29595
55	**limit** 54 to yr=”2000 -current”	23564
56	**limit** 55 to full text	3316

MEDLINE Search

- Searched via Ovid (http://ovidsp.ovid.com/).
- Database: Ovid MEDLINE(R) 1946 to February 14, 2020
- Date range searched: 2000 to current.
- Searched on 18 February 2020.
- Records retrieved: 1407

MEDLINE Search		
Number	**Searches**	**Results**
1	exp Accreditation/	18693
2	accreditation$1.mp.	25389
3	accredit$.tw.	18455
4	exp Joint Commission on Accreditation of Healthcare Organizations/	7451
5	(joint commission or joint commission on accreditation of hospital$1 or joint commission on accreditation of healthcare organi#ations or jcaho or jcia).mp.	9157
6	or/1-5	31103
7	exp hospitals/	269911
8	hospital$1.mp.	1239780
9	(center$1 or centre$1).mp.	727729
10	health$ institution$.mp.	4330
11	health$ facilit$.tw.	14634
12	healthcare organi#ation$.tw.	5268
13	((university or academic) adj medical adj (city or center$1 or centre$1 or health facilit$)).tw.	19731
14	((cancer or oncology) adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	36658
15	((cardiac or heart or cardio$) adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	8333
16	(stroke adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	1971
17	(rehabilitation adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	8765
18	((mental or psychiatry$2) adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	6711
19	(p?ediatric adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	6944
20	(trauma adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	14350
21	(birth$ adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	1659
22	((long term or geriatric) adj2 (center$1 or centre$1 or institut$ or facilit$)).tw.	9157
23	or/7-22	1869979
24	exp "Quality of Health Care"/	6785035
25	(quality of health care or health care quality).mp.	141179
26	exp Quality Improvement/	24052
27	quality improve$.mp.	44442
28	exp Quality Control/	48603
29	quality control.mp.	74209
30	exp Total Quality Management/	12490
31	total quality management.mp.	12882
32	exp Quality Assurance, Health Care/	322605
33	(quality assurance, health care or quality assurance).mp.	68576
34	exp Health Services/	2091081
35	health$ service$1.mp.	417663

MEDLINE Search		
Number	**Searches**	**Results**
36	quality of service$.mp.	4766
37	quality indicator$.tw.	6430
38	performance indicator$1.tw.	2878
39	bench?mark$.tw.	26729
40	exp Patient Safety/	19060
41	patient safety.mp.	36414
42	exp Delivery of Health Care/	1054687
43	job satisfaction.mp. or exp Job Satisfaction/	26302
44	satisfaction.mp. or exp Personal Satisfaction/	177327
45	patient satisfaction.mp. or exp Patient Satisfaction/	99017
46	exp Mortality/	373564
47	mortality risk/ or mortality.mp. or mortality rate/	1014378
48	morbidity.mp. or exp Morbidity/	812895
49	infection/ or infection rate/ or infection.mp.	1047368
50	Attitude of Health Personnel.mp. or exp "Attitude of Health Personnel"/	155621
51	(impact or affect or value or outcome$1 or perception$1).mp.	4226102
52	(influence or effect or change or result or cost or evaluat$ or "assess" or association or relation$).tw.	8747992
53	(decrease or negative or reduce or reduction).tw.	2786204
54	(achieve$ or induce$1 or improve$ or progress or increase or help or positive or develop$ or better or advance$ or raise or rise or enhance$ or reinforce).tw.	10065815
55	or/24-54	17740273
56	6 and 23	12218
57	55 and 56	12096
58	limit 57 to yr="2000 -current"	7513
59	limit 58 to full text	1407

Cochrane Database of Systematic Reviews (CDSR)

The Cochrane Central Register of Controlled Trials (CENTRAL)

- Searched via Cochrane Library (https://cochranelibrary.com/)
- Issue 2 of 12, February 2020
- Searched on 18 February 2020
- Records retrieved: 567 (71 CDSR, 496 CENTRAL).

CDSR and CENTRAL Search		
ID	**Searches**	**Hits**
#1	MeSH descriptor: [Accreditation] explode all trees	23
#2	MeSH descriptor: [Joint Commission on Accreditation of Healthcare Organizations] explode all trees	3
#3	accredit*	1079
#4	"joint commission" or "joint commission on accreditation of hospital*" or "joint commission on accreditation of healthcare organi?ations" or "jcaho" or "jcia"	173
#5	#1 OR #2 OR #3 OR #4	1213
#6	MeSH descriptor: [Hospitals] explode all trees	3541
#7	MeSH descriptor: [Health Facilities] explode all trees	14093
#8	MeSH descriptor: [Rehabilitation Centers] this term only	308
#9	MeSH descriptor: [Academic Medical Centers] this term only	340
#10	MeSH descriptor: [Birthing Centers] this term only	14
#11	MeSH descriptor: [Maternal-Child Health Centers] this term only	46
#12	MeSH descriptor: [Trauma Centers] this term only	183
#13	MeSH descriptor: [Secondary Care Centers] this term only	7
#14	MeSH descriptor: [Tertiary Care Centers] this term only	301
#15	Hospital*:ti,ab,kw	171745
#16	(center or centers or centre or centres):ti,ab,kw	122555
#17	(Health* NEAR/2 institution*):ti,ab,kw	404
#18	((university or academic) NEAR/2 medical NEAR/2 (city or center or centers or centre or centres or "health facilit*")):ti,ab,kw	3740
#19	((cancer or oncology or cardiac or heart or cardio* or stroke or rehabilitation or mental or psychiatry* or "long term" or geriatric or p*ediatric or trauma or birth*) NEAR/2 (center or centers or centre or centres or institut* or facilit*)):ti,ab,kw	13976
#20	#6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19	273799
#21	#5 AND #20	585
#23	#5 AND #20 (with Cochrane Library publication date from Jan 2000 to Feb 2020, in **Cochrane Reviews and Cochrane Protocols**)	71
#24	#5 AND #20 (with Publication Year from 2000 to 2020, **in Trials**)	496

Social Sciences Citation Index (SSCI)

- Searched via Web of Science (www.webofknowledge.com/).
- Date range searched: 2000 to 2020.
- Searched on 18 February 2020.

SSCI Search		
Set	**Results**	**Search**
# 34	1,588	(#31 AND #30) AND **DOCUMENT TYPES**: (Article OR Abstract of Published Item OR Database Review OR Review) *Indexes=SSCI Timespan=2000-2020*
# 33	1,650	#31 AND #30 *Indexes=SSCI Timespan=2000-2020*
# 32	1,791	#31 AND #30 *Indexes=SSCI Timespan=All years*
# 31	1,864	#20 AND #4 *Indexes=SSCI Timespan=All years*
# 30	3,813,911	#29 OR #28 OR #27 OR #26 OR #25 OR #24 OR #23 OR #22 OR #21 *Indexes=SSCI Timespan=All years*
# 29	3,799,534	TS=(mortality OR morbidity OR infection* OR impact OR affect OR value OR outcome* OR perception* OR influence OR effect OR change OR result OR cost OR evaluat* OR association OR relation* OR decrease OR negative OR reduce OR reduction OR achieve* OR induce* OR improve* OR progress OR increase OR help OR positive OR develop* OR better OR advance* OR raise OR rise OR enhance* OR reinforce OR attitude) *Indexes=SSCI Timespan=All years*
# 28	128,711	TS=(satisfaction OR "job satisfaction" OR "patient satisfaction") *Indexes=SSCI Timespan=All years*
# 27	4,965	TS=("delivery of health care" OR "health care delivery") *Indexes=SSCI Timespan=All years*
# 26	10,775	TS=("patient safety") *Indexes=SSCI Timespan=All years*
# 25	39,459	TS=("quality indicator*" OR "performance indicator*" OR "quality measure*" OR "performance measure*" OR benchmarking OR "bench-mark" OR "bench-marking" OR "bench marking") *Indexes=SSCI Timespan=All years*
# 24	2,354	TS=("quality of service*") *Indexes=SSCI Timespan=All years*
# 23	68,570	TS=("health* service*") *Indexes=SSCI Timespan=All years*
# 22	9,245	TS=("total quality management" OR "quality control" OR "quality assurance") *Indexes=SSCI Timespan=All years*
# 21	3,801	TS=("quality of health care" OR "health care quality") *Indexes=SSCI Timespan=All years*
# 20	341,287	#19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 *Indexes=SSCI Timespan=All years*
# 19	968	TS=(birth* NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SSCI Timespan=All years*
# 18	2,141	TS=(trauma NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SSCI Timespan=All years*
# 17	1,007	TS=((pediatric OR paediatric) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SSCI Timespan=All years*

SSCI Search		
Set	**Results**	**Search**
# 16	3,909	TS=(("long term" OR geriatric) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SSCI Timespan=All years*
# 15	5,044	TS=((mental OR psychiatry*) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SSCI Timespan=All years*
# 14	3,615	TS=(rehabilitation NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SSCI Timespan=All years*
# 13	543	TS=(stroke NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SSCI Timespan=All years*
# 12	629	TS=((cardiac OR heart OR cardio*) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SSCI Timespan=All years*
# 11	5,197	TS=((cancer OR oncology) NEAR/2 (center OR centers OR centre OR centres or institute* OR facilit*)) *Indexes=SSCI Timespan=All years*
# 10	4,658	TS=((university OR academic) NEAR/2 medical NEAR/2 (city OR center* OR centre* OR "health facility*")) *Indexes=SSCI Timespan=All years*
# 9	2,373	TS=("health* facility") *Indexes=SSCI Timespan=All years*
# 8	1,876	TS=("health* institut*") *Indexes=SSCI Timespan=All years*
# 7	14,465	TS=("health* organization*") *Indexes=SSCI Timespan=All years*
# 6	182,131	TS=(center OR centers OR centre OR centres) *Indexes=SSCI Timespan=All years*
# 5	156,921	TS=(hospital OR hospitals) *Indexes=SSCI Timespan=All years*
# 4	7,245	#3 OR #2 OR #1 *Indexes=SSCI Timespan=All years*
# 3	650	TS=("joint commission" OR "joint commission on accreditation of hospital*" OR "joint commission on accreditation of healthcare organizations" OR "jcaho" OR "jcia") *Indexes=SSCI Timespan=All years*
# 2	6,842	TS=(accredit*) *Indexes=SSCI Timespan=All years*
# 1	4,664	TS=(accreditation) *Indexes=SSCI Timespan=All years*

KCI-Korean Journal Database

- Searched via Web of Science (www.webofknowledge.com/).
- Date range searched: 2000 to 2020.
- Searched on 18 February 2020.

KCI-Korean Search		
Set	**Results**	**Search**
# 34	421	(#33) AND **DOCUMENT TYPES:** (Research-Article) *Indexes=KJD Timespan=2000-2020*
# 33	421	#32 *Indexes=KJD Timespan=2000-2020*
# 32	421	#31 AND #30 *Indexes=KJD Timespan=All years*
# 31	433	#20 AND #4 *Indexes=KJD Timespan=All years*
# 30	1,283,270	#29 OR #28 OR #27 OR #26 OR #25 OR #24 OR #23 OR #22 OR #21 *Indexes=KJD Timespan=All years*
# 29	1,281,738	TS=(mortality OR morbidity OR infection* OR impact OR affect OR value OR outcome* OR perception* OR influence OR effect OR change OR result OR cost OR evaluat* OR association OR relation* OR decrease OR negative OR reduce OR reduction OR achieve* OR induce* OR improve* OR progress OR increase OR help OR positive OR develop* OR better OR advance* OR raise OR rise OR enhance* OR reinforce OR attitude) *Indexes=KJD Timespan=All years*
# 28	54,319	TS=(satisfaction OR "job satisfaction" OR "patient satisfaction") *Indexes=KJD Timespan=All years*
# 27	133	TS=("delivery of health care" OR "health care delivery") *Indexes=KJD Timespan=All years*
# 26	584	TS=("patient safety") *Indexes=KJD Timespan=All years*
# 25	6,861	TS=("quality indicator*" OR "performance indicator*" OR "quality measure*" OR "performance measure*" OR benchmarking OR "bench-mark" OR "bench-marking" OR "bench marking") *Indexes=KJD Timespan=All years*
# 24	1,913	TS=("quality of service*") *Indexes=KJD Timespan=All years*
# 23	1,890	TS=("health* service*") *Indexes=KJD Timespan=All years*
# 22	3,141	TS=("total quality management" OR "quality control" OR "quality assurance") *Indexes=KJD Timespan=All years*
# 21	148	TS=("quality of health care" OR "health care quality") *Indexes=KJD Timespan=All years*
# 20	106,994	#19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 *Indexes=KJD Timespan=All years*
# 19	49	TS=(birth* NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*
# 18	138	TS=(trauma NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*
# 17	37	TS=((pediatric OR paediatric) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*

KCI-Korean Search		
Set	**Results**	**Search**
# 16	628	TS=(("long term" OR geriatric) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*
# 15	438	TS=((mental OR psychiatry*) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*
# 14	744	TS=(rehabilitation NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*
# 13	283	TS=(stroke NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*
# 12	154	TS=((cardiac OR heart OR cardio*) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*
# 11	572	TS=((cancer OR oncology) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=KJD Timespan=All years*
# 10	579	TS=((university OR academic) NEAR/2 medical NEAR/2 (city OR center* OR centre* OR "health facility*")) *Indexes=KJD Timespan=All years*
# 9	103	TS=("health* facility") *Indexes=KJD Timespan=All years*
# 8	155	TS=("health* institut*") *Indexes=KJD Timespan=All years*
# 7	1,051	TS=("health* organization*") *Indexes=KJD Timespan=All years*
# 6	78,265	TS=(center OR centers OR centre OR centres) *Indexes=KJD Timespan=All years*
# 5	30,323	TS=(hospital OR hospitals) *Indexes=KJD Timespan=All years*
# 4	1,564	#3 OR #2 OR #1 *Indexes=KJD Timespan=All years*
# 3	92	TS=("joint commission" OR "joint commission on accreditation of hospital*" OR "joint commission on accreditation of healthcare organizations" OR "jcaho" OR "jcia") *Indexes=KJD Timespan=All years*
# 2	1,483	TS=(accredit*) *Indexes=KJD Timespan=All years*
# 1	1,107	TS=(accreditation) *Indexes=KJD Timespan=All years*

Russian Science Citation Index (RSCI)

- Searched via Web of Science (www.webofknowledge.com/).
- Date range searched: 2005 to 2020 (all years).
- Searched on 18 February 2020.

RSCI Search		
Set	**Results**	**Search**
# 22	38	(#21) AND **DOCUMENT TYPES:** (Article OR Review) *Indexes=RSCI Timespan=All years*
# 21	41	#20 AND #4 *Indexes=RSCI Timespan=All years*
# 20	25,420	#19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 *Indexes=RSCI Timespan=All years*
# 19	6	TS=(birth* NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 18	17	TS=(trauma NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 17	107	TS=((pediatric OR paediatric) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 16	42	TS=(("long term" OR geriatric) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 15	86	TS=((mental OR psychiatry*) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 14	179	TS=(rehabilitation NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 13	44	TS=(stroke NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 12	423	TS=((cardiac OR heart OR cardio*) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 11	386	TS=((cancer or oncology) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=RSCI Timespan=All years*
# 10	15	TS=((university OR academic) NEAR/2 medical NEAR/2 (city OR center* OR centre* OR "health facility*")) *Indexes=RSCI Timespan=All years*
# 9	44	TS=("health* facility") *Indexes=RSCI Timespan=All years*
# 8	143	TS=("health* institut*") *Indexes=RSCI Timespan=All years*
# 7	416	TS=("health* organization*") *Indexes=RSCI Timespan=All years*
# 6	18,466	TS=(center OR centers OR centre OR centres) *Indexes=RSCI Timespan=All years*
# 5	7,045	TS=(hospital OR hospitals) *Indexes=RSCI Timespan=All years*
# 4	260	#3 OR #2 OR #1 *Indexes=RSCI Timespan=All years*

RSCI Search		
Set	**Results**	**Search**
# 3	4	TS=("joint commission" OR "joint commission on accreditation of hospital*" OR "joint commission on accreditation of healthcare organizations" OR "jcaho" OR "jcia") *Indexes=RSCI Timespan=All years*
# 2	256	TS=(accredit*) *Indexes=RSCI Timespan=All years*
# 1	185	TS=(accreditation) *Indexes=RSCI Timespan=All years*

SciELO Citation Index

- Searched via Web of Science (www.webofknowledge.com/).
- Date range searched: 2002 to 2020 (all years).
- Searched on 18 February 2020.

SciELO Search		
Set	**Results**	**Search**
# 22	250	(#21) AND **DOCUMENT TYPES:** (Research-Article OR Review-Article OR Case-Report OR Undefined) *Indexes=SCIELO Timespan=All years*
# 21	262	#20 AND #4 *Indexes=SCIELO Timespan=All years*
# 20	66,655	#19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 *Indexes=SCIELO Timespan=All years*
# 19	77	TS=(birth* NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 18	128	TS=(trauma NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 17	166	TS=((pediatric OR paediatric) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 16	134	TS=(("long term" OR geriatric) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 15	285	TS=((mental OR psychiatry*) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 14	286	TS=(rehabilitation NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 13	69	TS=(stroke NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 12	330	TS=((cardiac OR heart OR cardio*) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 11	632	TS=((cancer OR oncology) NEAR/2 (center OR centers OR centre OR centres OR institute* OR facilit*)) *Indexes=SCIELO Timespan=All years*
# 10	66	TS=((university OR academic) NEAR/2 medical NEAR/2 (city OR center* OR centre* OR "health facility*")) *Indexes=SCIELO Timespan=All years*
# 9	244	TS=("health* facility") *Indexes=SCIELO Timespan=All years*
# 8	1,151	TS=("health* institut*") *Indexes=SCIELO Timespan=All years*
# 7	3,464	TS=("health* organization*") *Indexes=SCIELO Timespan=All years*
# 6	27,786	TS=(center OR centers OR centre OR centres) *Indexes=SCIELO Timespan=All years*
# 5	38,242	TS=(hospital OR hospitals) *Indexes=SCIELO Timespan=All years*

SciELO Search		
Set	**Results**	**Search**
# 4	898	#3 OR #2 OR #1 *Indexes=SCIELO Timespan=All years*
# 3	24	TS=("joint commission" OR "joint commission on accreditation of hospital*" OR "joint commission on accreditation of healthcare organizations" OR "jcaho" OR "jcia") *Indexes=SCIELO Timespan=All years*
# 2	884	TS=(accredit*) *Indexes=SCIELO Timespan=All years*
# 1	621	TS=(accreditation) *Indexes=SCIELO Timespan=All years*

ScienceDirect

- Searched via ScienceDirect (http://sciencedirect.com/).
- Date range searched: 2000 to 2020.
- Searched on 18 February 2020.
- Searching was conducted for title, abstract, or key words through research articles, review articles, data articles, and case reports (2000-2020)

Accredit, hospital – 751 results
Accredit, centers – 729 results
Joint Commission, hospital – 236 results
Joint Commission, center – 299 results
Accreditation, impact – 528 results
Accreditation, outcome – 749 results
Accreditation, quality – 1391 results
Total exported references 4683
After removing duplicates 1772

PROSPERO

- Searched via www.crd.york.ac.uk/PROSPERO/.
- Searched on 18 February 2020.
- Records retrieved: 169.

PROSPERO Search		
Number	**Searches**	**Results**
#1	MeSH DESCRIPTOR accreditation EXPLODE ALL TREES	3
#2	accreditation	68
#3	accredited	89
#4	accredit*:ti,kw	5
#5	MeSH DESCRIPTOR Joint Commission on Accreditation of Healthcare Organizations EXPLODE ALL TREES	0
#6	Joint Commission on Accreditation of Healthcare Organizations	2
#7	joint commission	15
#8	JCAHO or jcia	3
#9	external assessment or external evaluation	12
#10	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9	169

APPENDIX A2: Summary of the Key Findings of All Studies Included in the Review (n=76)

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Lám 2016, Hungary *(in Hungarian)*	Assess organizational culture changes in pilot institutes of the accreditation program.	Descriptive, comparative, cross-sectional research using before-and-after design.	The increase in the proportion of positive responses was statistically significant in the dimensions of organizational learning, continuous improvement, open communication, and teamwork in the organizational unit, whereas none of the decreased dimensions was significant.	4 (BELLA - Hungary)	Positive (1)	**Fair**
Lee 2016, Korea	Compare registered nurses' perceptions of safety climate and attitude toward medication error reporting before and after hospital accreditation and identify the relationship between perceived safety climate and attitude toward medication error reporting.	A comparative descriptive longitudinal questionnaire-based study using before-and-after design.	The level of safety climate increased significantly after accreditation. Out of 19 items in the survey, 12 items were improved significantly. Similarly, the attitude toward medication error reporting increased, and negative attitudes decreased significantly after accreditation.	1 (KOIHA - Korea)	Positive (1)	**Fair**
Andres 2019, China	Assess the longitudinal relationship between accreditation and hospital professional staff perception of organizational culture.	A prospective exploratory longitudinal cohort study design.	The hierarchical culture was the dominant organizational culture domain pre-accreditation. Following accreditation, hierarchical culture declined significantly but remained dominant, while group and developmental culture increased.	1 (ACHS - Australia)	Positive (1)	**Fair**
Kim 2019, Korea *(in Korean)*	Compare nurse accreditation perception, job stress, turnover intention, safety management recognition in a general hospital before and after hospital's accreditation.	A descriptive comparative study with a before-and-after design.	There was no significant difference in turnover intention and safety management culture before and after accreditation. Compared to the pre-accreditation preparatory phase, job stress decreased significantly after accreditation.	1 (KOIHA - Korea)	Neutral (1) Negative (2)	**Fair**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Greenfield 2019, Australia	Examine the effect of longitudinal accreditation participation on improving continuity of quality patient care and human resource management (HRM) processes outcomes.	Cohort longitudinal study through secondary data analysis. Data were collected in 2003-2006 (Time 1) and 2007-2010 (Time 2).	The results for HRM processes score at Time 1 and Time 2 were: T1 (2.92 ± 0.29) and T2 (3.10 ± 0.26). HRM processes scores and the continuity of quality patient care significantly improved over time for all three of the mandatory accreditation performance groups.	311 (ACHS - Australia)	Positive (1, 5)	**Good**
Domingues 2017, Brazil	Evaluate the influence of hospital accreditation on the process of permanent education in Health.	A cross-sectional, descriptive, retrospective, documentary, and quantitative research carried out using a before-and-after study design.	Overall, there was evidence of a gradual increase in the number of educational activities by 22% post-accreditation compared to pre-accreditation (56 vs 44 activities, respectively). The multi-professional team had an increase of 20% in the number of educational activities, and the nursing team had an increase of 37% as recipients.	1 (ONA - Brazil)	Positive (2)	**Poor**
Al-Faouri 2019, Jordan	Assess healthcare providers' perceived stress levels before and after hospital accreditation survey site visits.	A cross-sectional descriptive study using a before-and-after design.	Perceived stress levels among healthcare providers were significantly higher before accreditation site visits compared to post-accreditation.	2 (HCAC - Jordan)	Negative (2)	**Good**
Higashi 2013, Brazil	Evaluate the frequency of perceived work-related stressors by nurses in hospitals based on accreditation status.	A cross-sectional questionnaire-based study.	At an accredited hospital, nurses perceived more work-related stressors compared to non-accredited ones.	3 (ONA - Brazil)	Negative (2)	**Fair**
Elkins 2010, USA	Examine hospital accreditation impact on the perceived stress among nursing hospital management and administrative employees.	A descriptive observational cross-sectional questionnaire-based study using a before-and-after research design.	Perceived stress, anxiety, and depression were significantly higher during accreditation preparation compared to post-accreditation. Staff satisfaction and sleep function were improved significantly post-accreditation compared to the accreditation preparation period.	1 (JCAHO - USA)	Negative (2)	**Fair**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Kagan 2016, Israel	Examine the long-term impact of hospital accreditation on the nursing work environment and the association between nursing work environment and the perceived accreditation on organizational climate.	A longitudinal before-and-after questionnaire-based study.	Post-accreditation scores in both samples; the nonpaired (n=763) and paired (n=89), for the 3 components of the nursing work environment (i.e., autonomy, control over nursing practice, and nurse-physician relations) were non-significantly higher than the pre-accreditation scores, except for autonomy subscale in the paired sample.	1 (JCIA - USA)	Neutral (2)	**Fair**
Oliveira 2018, Brazil	Analyze the influence of hospital accreditation on the work environment of the nursing team.	Cross-sectional study using an explanatory sequential mixed-method approach.	There was no statistically significant association between hospital accreditation and nursing staff perception of the work environment, either at pairs level (private accredited vs private non-accredited, private accredited vs public non-accredited) and in evaluating the three groups together.	3 (ONA - Brazil)	Neutral (2)	**Fair**
Oliveira 2016, Brazil	Compare and identify the nursing working environment of accredited and non-accredited public hospitals.	Quantitative cross-sectional study.	Hospital accreditation resulted in no significant effect on nurses' work environment as the environment was favorable to all NWI-R domains.	2 (ONA - Brazil)	Neutral (2)	**Good**
Oliveira 2019, Brazil	Analyze the influence of hospital accreditation on the professional satisfaction of nursing workers.	Multicentric cross-sectional study using an explanatory mixed-method approach.	Overall, workers of the accredited hospital had a better job satisfaction score. The comparison of the three groups investigated confirmed that accreditation positively influenced the professional satisfaction of the nursing workers.	3 (ONA - Brazil)	Positive (2)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Um 2018, Korea	Examine clinical nutrition service provisions based on hospital accreditation status.	A comparative nationwide cross-sectional survey.	Malnourished patients in accredited hospitals received an insignificantly higher nutritional intervention rate compared to non-accredited hospitals. In accredited hospitals, time spent on direct care was significantly higher, however, it was significantly lower for outpatient care compared to non-accredited hospitals.	35 (JCIA - USA)	Neutral (2, 5)	**Fair**
Joseph 2018, India	Examine the impact of hospital accreditation on physical infrastructure and patient satisfaction in public hospitals.	Quantitative cross-sectional survey-based study.	There was no significant impact of accreditation on patient satisfaction (mean score 4.28 in both accredited and non-accredited hospitals).	14 (NABH and KASH - India)	Neutral (3)	**Poor**
Heuer 2004, USA	Examine the relationship between accreditation scores and independently measured patient satisfaction scores.	A quasi-experimental study using Ex post facto comparative retrospective analysis design.	There was no relationship between summative accreditation scores and patient satisfaction and no relationship between patient satisfaction and corresponding Joint Commission assessment categories.	41 (JCAHO - USA)	Neutral (3)	**Fair**
Hayati 2010, Malaysia	Examine the impact of hospital accreditation on patient satisfaction and assess the association between patient satisfaction and hospital workload.	A cross-sectional comparative study.	There was no significant difference in patients' satisfaction with the provided quality of services between accredited and non-accredited hospitals neither at overall level nor at dimensions level.	4 (MSQH - Malaysia)	Neutral (3)	**Fair**
Barghouthi 2018, Palestine	Assess the relationship between patient satisfaction and hospital accreditation status.	A quantitative descriptive cross-sectional comparative questionnaire-based study.	The mean of patient satisfaction was slightly higher in non-accredited hospitals compared to accredited hospitals; however, the difference was not significant.	2 (JCIA - USA)	Neutral (3)	**Fair**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Haj-Ali 2014, Lebanon	Explore the impact of hospital accreditation on patient satisfaction.	An observational explanatory cross-sectional questionnaire-based study.	Most of the patients (76.34%) were unsatisfied with the quality of services. After confounders adjustment, there was no statistically significant association between accreditation classification and patient satisfaction.	6 (MoPH - Lebanon)	Neutral (3)	**Good**
Al-Qahtani 2012, Saudi Arabia	Examine hospital accreditation impact on the quality of health care services in Obstetrics and Gynecology clinics, as perceived by patients.	A cross-sectional comparative questionnaire-based study.	Although patients at accredited and non-accredited hospitals had positive perceptions of the provided quality of services, patients at the accredited hospital were more satisfied.	2 (JCIA - USA)	Positive (3)	**Good**
Ajarmah 2015, Jordan	Examine the effect of hospital accreditation programs on patient satisfaction.	Descriptive quantitative cross-sectional study, questionnaire-based.	There was a significant difference in patients' satisfaction with the provided quality of services between accredited and non-accredited hospitals at the overall level and all SERVQUAL dimensions level.	74 (not reported)	Positive (3)	**Fair**
Mohebbifar 2017, Iran	Examine the relationship between hospital accreditation and patient satisfaction.	A cross-sectional descriptive questionnaire-based study.	Overall, patients had a moderate level of satisfaction toward the quality of health care services provided (65%). After adjusting for confounders, hospital accreditation had a significant inverse association with overall patient satisfaction.	7 (MOHME - Iran)	Negative (3)	**Fair**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Andres 2019, China	Assess the longitudinal impact of hospital accreditation on patient experience in a university teaching hospital.	A prospective exploratory longitudinal study design. Patient experience was assessed by three cross-sectional surveys.	Cross-sectionally, all domains of patient experience scores declined (improved) over the study period. Regression analysis confirmed declining (improving) all parameter estimates 3 months and 15 months following accreditation except for the 'continuity and transition' domain.	1 (ACHS - Australia)	Positive (3)	**Good**
Sack 2010, Germany	Assess the relationship between patient satisfaction and accreditation status in the field of cardiology.	Comparative descriptive cross-sectional study.	There was no statistically significant difference between accredited and non-accredited units regarding the "recommendation rate of a given hospital"	25 (KTQ and pCC - Germany)	Neutral (3)	**Good**
Sack 2011, Germany	Assess the relationship between patient satisfaction and accreditation status.	Comparative descriptive cross-sectional study.	Overall, 66.3% of all the patients recommend their hospital to others. This recommendation, however, was not related to the accreditation status in the univariate analyses.	73 (KTQ and pCC - Germany)	Neutral (3)	**Good**
Lam 2018, USA	Comparing health outcomes of patients admitted to US accredited hospitals versus hospitals reviewed by state surveys, and whether Joint Commission accreditation associated with an additional benefit for patients compared with other independent accrediting bodies.	Observational cross-sectional retrospective study.	Patients treated at accredited hospitals had lower 30-day mortality rates than those at hospitals that were reviewed by a state survey agency, but nearly identical mortality rates for surgical conditions. Medical conditions readmissions at 30 days were significantly lower at accredited hospitals than at state survey hospitals but did not differ for the surgical conditions. Patient experience scores were modestly better at state survey hospitals than at accredited hospitals.	4400 (JCAHO and other independent bodies - USA)	Negative (3) Positive (4)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Marzban 2017, Iran	Examine the statuses of quality indices in 11 accredited educational hospitals with different accreditation degrees.	Descriptive cross-sectional study.	There was no significant difference in performance indicators between hospitals with different accreditation degrees.	11 (MOHME - Iran)	Neutral (3, 4)	**Poor**
Salmon 2003, South Africa	Assess the effects of COHSASA accreditation program on public hospitals' processes and outcomes in a developing country setting.	Prospective randomized control trial.	Intervention hospitals improved their average overall compliance with COHSASA standards significantly from 48% to 78% in about 2 years after accreditation began. No meaningful change occurred in any service element in the control hospitals. Apart from the nurses' perceptions of clinical quality in the accredited hospitals, the remaining seven quality indicators showed little or no effect; patient satisfaction with care; patient medication education; accessibility of medical records; completeness of medical records; completeness of perioperative notes; labeling of ward stock; and, composite assessment of hospital sanitation.	20 (COHSASA - South Africa)	Neutral (3, 5)	**Fair**
Salim 2017, United Arab Emirates	Assess the impact of accreditation on Infection Control (IC) performance measures.	An empirical longitudinal case study.	Overall, accreditation showed a potentially positive impact on infection control measures. The trend of VAP, CLABSI, and CAUTI was declining in the period before accreditation. The VAP and CLABSI significantly dropped immediately post-accreditation, whereas CAUTI level significantly increased. The level of SSI also decreased non-significantly after the JCI accreditation in 2010 while the trend was increasing before.	1 (JCIA - USA)	Positive (4)	**Fair**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Mørk Hansen 2013, Denmark *(in Danish)*	Evaluate whether the accreditation process has resulted in a decrease in the prevalence of nosocomial infections in the Region of Northern Jutland, Denmark.	A retrospective prevalence study.	Pre-accreditation, the overall prevalence of nosocomial infections was slightly insignificantly increasing, while in the period parallel to the accreditation process the overall prevalence decreased significantly. There were no statistically significant changes in the prevalence of PNEU, DSSI, and SE/BA pre-accreditation, but an annual increase in the prevalence of UTIs of 16.6% was statistically significant.	5 (DDKM -Denmark)	Positive (4)	**Poor**
Almasabi 2017, Saudi Arabia	Understand the impact of CBAHI accreditation on the quality of care in Saudi Arabia.	Mixed methods approach, quantitative and qualitative (i.e., cross-sectional surveys, documentary analyses, and interviews).	Quantitatively, accreditation has no significant effect on mortality in the three hospitals, in addition to conflicting findings in terms of infection rate and length of stay.	3 (CBAHI - Saudi Arabia)	Neutral (4)	**Poor**
Barnett 2017, USA	Assess whether heightened vigilance during survey weeks is associated with a change in patient outcomes compared with non-survey weeks.	Observational quasi-randomized analysis.	There was a significant decrease in 30-day mortality for admissions occurring during a survey week vs. the surrounding 3 weeks. Larger effects were observed among major teaching hospitals.	1984 (JCAHO - USA)	Positive (4)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Towers 2014, USA	Explore the possibility of the ebb and flow in patient outcomes with Joint Commission accreditation site visits by examining monthly patterns in risk-adjusted inpatient mortality rates around accreditation site visits. As well, explore the role of slack resources in shielding healthcare organizations from the ebbs and flows of external pressures.	A retrospective cohort study.	Adherence to Joint Commission standards contributes to improved inpatient mortality rates in hospitals. Mortality rates temporarily dropped significantly following Joint Commission inspection at Month (+1) period, and subsequently, return to pre-inspection levels (an approximately 4% reduction in the risk-adjusted mortality rate).	58 (JCAHO - USA)	Positive (4)	**Fair**
Falstie-Jensen 2015, Denmark	Examine the association between hospital accreditation compliance and mortality.	A prospective follow-up population-based study.	Compared to patients at partially accredited hospitals, patients at fully accredited hospitals (i.e., high compliance with accreditation standards) had a lower 30-days mortality risk.	31 (DDKM -Denmark)	Positive (4)	**Good**
Falstie-Jensen 2018, Denmark	Examine the association between compliance with consecutive accreditation cycles and patient outcomes (namely, mortality, length of stay, and acute readmission).	A prospective observational follow-up population-based study.	Patients admitted at persistent low compliant hospitals had a higher 30-day mortality risk, a longer length of stay, whereas acute readmission had no difference than patients at high compliant hospitals.	25 (DDKM -Denmark)	Positive (4)	**Good**
Miller 2005, USA	Examine the association between JCAHO accreditation scores and AHRQ Inpatient Quality Indicators (IQIs) and the Patient Safety Indicators (PSIs).	A descriptive-analytical retrospective study.	Despite variation in AHRQ performance measures, most hospitals scored high (90% and 100%) on JCAHO measures with no significant relationship between them. None of the IQIs appeared to be related to the final overall evaluation score (FOES) at the $P < 0.05$.	2116 (JCAHO - USA)	Neutral (4)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Arab 2017, Iran *(in Persian)*	Investigate the impact of hospital accreditation process on healthcare outcomes performance indicators.	A quasi-experimental longitudinal descriptive-analytical study using an Interrupted Time Series design.	After hospital accreditation implementation, the average length of stay and bed turnover rate decreased significantly, patient satisfaction and the bed occupancy rate increased significantly, and the cesarean section rate decreased insignificantly compared to the pre-accreditation period.	14 (MOHME - Iran)	Positive (4)	**Fair**
Wardhani 2019, Indonesia	Explore the association of hospital design factors, market competition, and performance with hospital accreditation status.	An observational comparative study.	Although the differences in performance between accredited and non-accredited hospitals were not significant, accredited hospitals tended to have a higher bed occupancy rate, the average length of stay, turnover interval, net mortality rate, and gross mortality rate than not-accredited hospitals.	346 (ICAH - Indonesia)	Neutral (4)	**Fair**
Falstie-Jensen 2015, Denmark	Examine the association between hospital compliance with accreditation and length of stay (LOS) and acute readmission (AR).	A cohort retrospective nationwide population-based follow-up study.	Admissions at fully accredited hospitals were associated with a modest significantly shorter LOS compared with admissions at partially accredited hospitals after adjusting for confounding factors. Collaterally, no difference was observed in AR within 30 days after discharge.	31 (DDKM -Denmark)	Positive (4)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Janati 2016, Iran	Assess the impact of hospital accreditation on ICU quality of care and patient safety measures.	An interventional observational study.	Introducing accreditation interventions resulted in reducing pressure ulcer incidence significantly by 2.7% during the study period. similarly, a reduction of 1.45 days in the ICU average length of stay was significant. In contrast, an unexpected increase in hospital-acquired infection from 1.5% to 8.1% was seen.	1 (MOHME - Iran)	Positive (4)	**Fair**
Mumford 2015, Australia	Investigate the use of Staphylococcus aureus bacteremia (SAB) rates as an outcome indicator to measure the benefits of accreditation.	A retrospective cohort study.	Staphylococcus aureus bacteremia (SAB) rates across all hospitals fell from 1.34 per 10 000 bed days in 2009 to 0.77 per 10 000 bed days in 2012. Higher performing hospitals – in terms of higher accreditation scores, and especially in terms of infection control scores – were not associated with lower SAB rates.	77 (ACHS - Australia)	Neutral (4)	**Fair**
Jarrah 2019, Jordan	Explore the impact of hospital accreditation on patient safety in terms of defining triggers and adverse events.	Descriptive comparative record-based study.	Overall, hospital accreditation resulted in improving patient care and decrease adverse events. Hospital length of stay was significantly lower in accredited hospitals compared to non-accredited ones. Although the number of triggers in the accredited hospitals was significantly higher compared to non-accredited ones, the number of adverse events was significantly less.	6 (HCAC - Jordan)	Positive (4)	**Fair**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Leite 2019, Brazil	Compare Coronary Care Unit (CCU) length of stay (LOS) and the total hospital LOS of Acute Coronary Syndrome (ACS) patients before and after ONA 3 accreditation (excellence). Additionally, examine the impact of accreditation on clinical outcomes.	A systematic, observational, descriptive, prospective study.	CCU LOS reduced non-significantly from 3 to 2,5 days. Regarding the hospital LOS, there was a significant reduction from 8 to 6 days. In ACS subgroups, there was a significant reduction only at the hospital LOS in non-STEMI patients.	1 (ONA - Brazil)	Positive (4)	**Good**
Al-Sughayir 2016, Saudi Arabia	Investigate whether hospital accreditation drives improvements for the length of stay in psychiatric inpatients.	Non-experimental observational study through retrospective medical records review.	The average length of stay (LOS) post-accreditation was significantly reduced compared to the pre-accreditation period.	1 (ACI - Canada)	Positive (4)	**Fair**
Petrović 2018, Serbia	Investigate the impact of hospital accreditation process on health care quality indicators values.	Quasi-experimental comparative study of the "Difference-in-Difference" (DiD).	The accreditation process had a significant positive effect attributed to a shorter length of waiting for the first scheduled health cheque and surgical cheque, lower decubitus rate, and a decrease in length of stay for acute myocardial infarction patients, whereas mortality rate, mortality within the first 48 hours, and the average length of stay were not affected.	2 (AZUS - Serbia)	Positive (4, 5)	**Fair**
Chen 2003, USA	Examine the association between hospital accreditation, quality of care (i.e., use of recommended guidelines), and survival among acute myocardial infarction hospitalized patients.	A cross-sectional comparative study.	Patients treated at JCAHO surveyed hospitals had significantly lower 30-day mortality, were more likely to receive aspirin and beta-blockers, both on admission and during hospitalization, and reperfusion therapy, than patients treated at non-surveyed hospitals.	4221 (JCAHO - USA)	Positive (4, 5)	**Fair**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Al-Awa 2011, Saudi Arabia	This study aimed to determine if the accreditation process has a positive impact on patient safety and quality of care.	The interventional study, 4-year retrospective, and prospective study design.	Compared to pre-accreditation, 27 (33%) performance indicators out of 81 showed significant improvement post-accreditation. These indicators were in the following areas: mortality, Healthcare-Associated Infections (HAI), cardiopulmonary resuscitation codes, surgeries and invasive procedures, blood transfusion reaction, and adverse events.	1 (ACI - Canada)	Positive (4, 5)	**Poor**
Mosadeghrad 2018, Iran *(in Persian)*	Examine the association between hospital accreditation and hospital performance measures. In addition to identifying and ranking accreditation constructs that most affecting hospital performance.	A descriptive correlational study using data on two cross-sections.	Hospitals' accreditation scores were not correlated with their performance measures. However, accreditation scores of leadership and management; accident and emergency; and procurement departments had the most effect on hospitals' performance while physiotherapy, environmental health, and nutrition were the least.	244 (MOHME - Iran)	Neutral (4, 5)	**Fair**
Halasa 2015, Jordan	Assess the economic impact of hospital accreditation on selected structural and outcome performance measures.	A retrospective observational comparative study using difference-in-differences (DiD).	Compared to baseline data, accreditation resulted in a 119.3% improvement in the quality index. Explicitly, significant improvements were seen in the reduction in patients who returned to the ICU, reduction in annual staff turnover, and improvement in the completeness of medical records. These improvements translated into total savings of US$ 593 000 over 3 years. Hospital readmission within 30 days and return to surgery within 24 hours were not significant.	4 (JCIA - USA)	Positive (4, 5, 6)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Griffith 2002, USA	Examine the relationship of seven outcomes performance measures in non-federal general hospitals against Joint Commission scores.	Descriptive comparative correlational study.	Generally, Joint Commission measures were not correlated with outcome measures. The few significant correlations that appear are often counterintuitive.	742 (JCAHO - USA)	Neutral (4, 6)	**Fair**
Shaw 2010, Belgium, Czech, France, Ireland, UK, Poland, Spain	Identify systematic differences in quality management systems between hospitals that were accredited, or certificated, or neither.	A descriptive comparative study.	Overall compliance scores for 229 quality and safety criteria were 66.9% in accredited, 60.0% in certified, and 51.2% in hospitals neither accredited nor certified. Compliance score with quality and safety measures was consistently higher in accredited hospitals, except for the 'patients' rights' dimension.	71 (not reported)	Positive (5)	**Fair**
Shaw 2014, Czech, France, Germany, Poland, Spain, Portugal, Turkey	Explore the relationship between ISO 9001 certification, healthcare accreditation, and quality management activities in European hospitals.	Cross-sectional, mixed-method, and multi-level study.	In the clinical practice domain, accreditation showed benefits in AMI and stroke more than in deliveries and hip fracture; the most significant impact was the clinical review in stroke. Accreditation promotes processes and structural elements but has a limited effect on evidence-based practice delivery.	73 (not reported)	Positive (5)	**Good**
Abedi 2014, Iran	Examine the impact of hospital accreditation on reported medical errors.	A descriptive comparative study using a before-and-after design.	There was no significant difference in the rate of reported medical errors after accreditation compared to before accreditation.	38 (not reported)	Neutral (5)	**Poor**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Devkaran 2015, United Arab Emirates	Examine the impact of healthcare accreditation on hospital quality measures.	Interrupted time series (ITS), longitudinal quasi-experimental design.	Preparation for accreditation survey resulted in improvement as 20 of the 27 measures had a positive pre-accreditation slope (thirteen out of which are statistically significant). Additionally, accreditation had no significant impact (either positive or negative) on 11 out of the 27 measures. However, a residual benefit from accreditation, in terms of sustaining performance, was achieved during accreditation preparation (i.e., 20% higher than the baseline level in 2009).	1 (JCIA - USA)	Positive (5)	**Good**
Falstie-Jensen 2017, Denmark	Examine the association between accreditation compliance and delivering recommended hospital care.	A prospective follow-up population-based study.	Patients at fully accredited hospitals (i.e., high compliance with accreditation standards) were more likely to receive the recommended care for stroke, COPD, diabetes, and hip fracture than patients treated at partially accredited hospitals. In contrast, heart failure patients had an inverse association, whereas ulcer patients had no difference.	31 (DDKM -Denmark)	Positive (5)	**Good**
Devkaran 2019, United Arab Emirates	Evaluate hospital re-accreditation impact on quality, patient safety, and reliability over three accreditation cycles by testing the accreditation life cycle model on quality measures.	Interrupted time series (ITS), longitudinal quasi-experimental design.	Levene's test demonstrated a significant reduction in variation of the composite score quality measures with subsequent accreditation cycles. The study showed that repeated surveys could reduce variations and sustain improvements over the accreditation cycle.	1 (JCIA - USA)	Positive (5)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Bogh 2016, Denmark	Evaluate the impact of the first accreditation cycle in Denmark on changes over time in the quality of hospital care in all Danish public hospitals.	A multi-level, longitudinal, stepped-wedge, prospective, nationwide study.	When all performance measures were included in the analysis, a positive non-significant change was observed during accreditation compared with the period before accreditation. However, restricting the analyses to care processes that did not meet the target (compliance 68%) before accreditation, revealed a significant positive change in trend.	25 (DDKM -Denmark)	Positive (5)	**Good**
Schmaltz 2011, USA	Examine the association between Joint Commission accreditation and hospital performance measures for common diseases.	Observational comparative analysis study.	Compared to non-accredited hospitals, accredited hospitals had better baseline performance, larger gains over time, and significantly higher performance in 2008 on 13 out of 16 performance measures. After adjustment for baseline characteristics, the absolute difference in improvement was 4.2%.	3679 (JCAHO - USA)	Positive (5)	**Good**
Mumford 2014, Australia	Investigate hand hygiene suitability as an indicator of accreditation outcomes and test the positive correlation hypothesis between better accreditation outcomes and higher hand hygiene compliance score.	A retrospective, longitudinal, multisite comparative survey.	After matching the hand hygiene data with hospitals that underwent two accreditation surveys, achieving full accreditation for both surveys (n=8) was not significantly associated with higher hand hygiene rates versus those hospitals achieving full accreditation in only one survey.	96 (ACHS - Australia)	Neutral (5)	**Fair**
Barker 2002, USA	Identify the prevalence of medication administration errors.	A prospective cohort study.	In accredited and non-accredited hospitals, (234/1481) 16% and (56/284) 20% of the doses were in error, respectively. There was no significant difference in error rates by accreditation status.	24 (JCAHO - USA)	Neutral (5)	**Fair**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Braga 2018, Brazil	Examine the association between hospital accreditation level and results of care indicators, in addition to analyzing the proposed interventions and anticipate indicators' results for the next five years.	Retrospective quantitative documentary study.	Hospitals with the highest certification level did not have better care indicators results; however, it showed consistency in the results, which suggested a more secure organizational culture.	5 (ONA - Brazil)	Neutral (5)	**Fair**
Bogh 2015, Denmark	Examine longitudinal improvement in performance measures based on participation in accreditation programs (accredited vs. non-accredited hospitals).	A historical, prospective follow-up population-based study.	Participating in accreditation was not associated with larger improvement in performance measures as both groups (i.e., accredited and non-accredited) significantly improved their care performance processes over time.	33 (JCIA - USA; HQS - UK)	Neutral (5)	**Good**
Braithwaite 2010, Australia	Determine whether accreditation performance is associated with a self-reported clinical performance and independent ratings of four aspects of organizational performance (organizational culture, organizational climate, consumer involvement, and leadership)	Independent blinded assessment of organizational culture, organizational climate, consumer involvement, and leadership.	Accreditation performance was significantly positively correlated with organizational culture and leadership behaviors. Organizational climate and consumer involvement were not significantly associated with accreditation ratings.	19 (ACHS - Australia)	Positive (5)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Lutfiyya 2009, USA	Determine whether quality measures used in the center of Medicaid and medicare service (CMS) Hospital Compare database differed for rural critical access hospitals based on accreditation status.	A cross-sectional comparative study.	Compared to non-accredited, accredited rural critical access hospitals had significantly better compliance for 4 out of 16 hospital quality indicators (namely; % of AMI patients given aspirin at arrival, % of heart failure patients given ACE inhibitor for LVSD, % of heart failure patients given adult smoking cessation counseling, and % of pneumonia patients - with a history of smoking - given smoking cessation counseling).	730 (JCAHO - USA)	Positive (5)	**Good**
Al-Sughayir 2014, Saudi Arabia	Examine if hospital accreditation drives improvements in the clinical practice of giving pro re nata (PRN) antipsychotic medications for psychiatric inpatients.	An observational comparative retrospective record-based study using before-and-after design.	There was a 38% reduction in the number of administered PRN antipsychotics post-accreditation, which was statistically significant.	1 (ACI - Canada)	Positive (5)	**Good**
Wang 2015, China	Discuss the effectiveness of safe medication administration stewardship intervention in inpatient care and provide some reference for international counterparts.	Interventional non-randomized study.	The number of medication administration errors, intravenous administration errors, type 2 errors (errors reached patient and required monitoring and/or intervention to preclude harm), and the number of errors related to high-alert medications decreased post-accreditation significantly compared to pre-accreditation.	1 (JCIA - USA)	Positive (5)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Nomura 2016, Brazil	Analyze the quality of nursing documentation before and after hospital accreditation preparation, using the Quality of Nursing Diagnoses, Interventions, and Outcomes (Q-DIO) instrument.	An observational comparative retrospective study.	A significant improvement in the quality of nursing documentation was observed in 24 out of the 29 items (82.8%). The improvement was significant in all domains; nursing diagnoses as a process, nursing diagnoses as a product, nursing Interventions, and nursing Outcomes.	1 (JCIA - USA)	Positive (5)	**Fair**
Habib 2016, Lebanon	Assess the relationship between accreditation status and compliance with occupational health and safety accreditation standards.	A cross-sectional descriptive study.	Compared to non-accredited hospitals, accredited hospitals reported better occupational health and safety (OHS) performance in almost all indicators. Accredited hospitals were significantly better in training OHS committee members on OHS principles and policies, training hospital staff on office safety, having experienced OHS officers, and having emergency preparedness.	68 (MoPH - Lebanon)	Positive (5)	**Fair**
Pourreza 2017, Iran *(in Persian)*	Investigate the impact of compliance with hospital accreditation standards on emergency department performance indicators.	Cross-sectional descriptive-analytical study.	There was no significant relationship between accreditation and the performance of emergency departments in included hospitals.	8 (MOHME - Iran)	Neutral (5)	**Fair**
Al-Sughayir 2017, Saudi Arabia	Investigate whether hospital accreditation drives improvements for administered pro re nata (PRN) benzodiazepines in psychiatric inpatients.	Non-experimental observational study through retrospective medical records review.	Accreditation resulted in a reduction of approximately 22% in the number of administered PRN benzodiazepines. The average number of PRN benzodiazepine administrations per patient post-accreditation was significantly reduced compared to the pre-accreditation period.	1 (ACI - Canada)	Positive (5)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Salehian 2015, Iran *(in Persian)*	Assess the impact of hospital accreditation on productivity indexes in a public teaching hospital.	Interventional analytical cross-sectional study.	Hospital accreditation had a significant positive impact on the income-expense axis, a relatively positive effect on the performance indexes axis and specific unit axis, and no impact on the human resource axis. The amount of insurance deduction, amount on income not paid, and income:cost ratio were improved significantly after accreditation, whereas energy consumption per bed was not affected in the income-expense axis.	1 (MOHME - Iran)	Positive (6)	**Fair**
Lindlbauer 2016, Germany	Examine quality management certification impact on technical efficiency using data envelopment analysis (DEA).	A retrospective descriptive longitudinal study.	The mean efficiency of KTQ accredited hospitals differs significantly from the mean efficiency of non-accredited hospitals. Accreditation had a significant positive net impact on efficiency in the year of accreditation and the following two years and remained positive but insignificant after that.	748 (KTQ - Germany)	Positive (6)	**Good**
Okumura 2019, Japan	Examine the impact of standardization of the perioperative protocol for operating time in cataract surgery based on the Joint Commission International (JCI) accreditation guidelines.	A retrospective observational comparative study using a before-and-after design.	Pre-procedure time and post-procedure time significantly decreased after JCI accreditation, while the procedure time did not change substantially. Consequently, the total procedure time significantly reduced on average by 7.3 min per person after JCI accreditation.	1 (JCIA - USA)	Positive (6)	**Good**

Author, Country	Study Objective	Study Design	Main Results	Number of Hospitals (accreditation body - Country)	Impact (Category)*	Overall Methodological Quality
Lin 2019, Taiwan	Evaluate efficiency utilizing an objective performance assessment of various hospital departments and examine how hospital accreditations contribute toward hospital efficiencies.	Descriptive analytical study.	Impulse Response Function (IRF) revealed that accreditation improved the efficiency of all departments during the first year of accreditation introductions.	15 (TJCHA - Taiwan)	Positive (6)	**Fair**
Saquetto 2019, Brazil	Describe the efficiency of private hospitals in Brazil and understand the influence of property structure, specialization, accreditation, and teaching activity on private hospitals' efficiency.	Descriptive analytical cross-section study.	Accreditation has a significant negative impact on hospital efficiency, especially under varying assumptions of scale. Staffing demands and investments in equipment and resources contributed to reducing the efficiency of private hospitals after accreditation.	98 (ONA - Brazil; JCI and NIAHIO - USA; ACI - Canada)	Negative (6)	**Good**
Inomata 2018, Japan	Examine JCI accreditation impact on operating room (OR) efficiency by comparing periods for patients who received surgeries (elective and emergency).	A retrospective observational study.	The total procedure/surgery time, procedure/surgery time, and post-procedure time were not significantly different between before-and-after JCI accreditation. The pre-anesthesia time was significantly slightly increased after accreditation, whereas the anesthesia induction time was significantly reduced.	1 (JCIA - USA)	Neutral (6)	**Fair**

** Impact categories: 1) changes in organizational culture and management; 2) changes at professionals' level; 3) changes at the patient level; 4) changes in patient clinical outcomes; 5) changes in the quality of services provided; 6) changes in economic outcomes. ACHS, Australian council on healthcare standards; MOHME, ministry of health and medical education; JCIA, joint commission international accreditation; TJCHA, Taiwan joint commission on hospital accreditation; ACI, accreditation Canada international; NIAHO, national integrated accreditation for healthcare organisations; ONA, national accreditation organisation (in Portuguese: organização nacional dae acreditação); KTQ, cooperation for transparency and quality in hospitals (in German: kooperation für transparenz und qualität im gesundheitswesen); MoPH, ministry of public health; JCAHO, joint commission on accreditation of healthcare organisations; DDKM, Danish healthcare quality programme (in Danish: den danske kvalitetsmodel); HQS, health quality services; AZUS, agency for accreditation of health care institutions of Serbia; HCAC, health care accreditation council; COHSASA, the council for health services accreditation of Southern Africa; KOIHA, Korean institute for healthcare accreditation; CBAHI, Saudi central board for accreditation of healthcare institutions; BELLA, accreditation of healthcare providers for safe patient care (in Hungarian: betegellátók akkreditációja a biztonságos betegellátásért); pCC, procum cert; MSQH, Malaysian society for quality in health; NABH, national accreditation board for hospitals and healthcare providers; KASH, Kerala accreditation standards for hospitals; ICAH, Indonesia commission on accreditation of hospitals*

APPENDICES B:
ADDITIONAL INFORMATION FOR CHAPTER 3

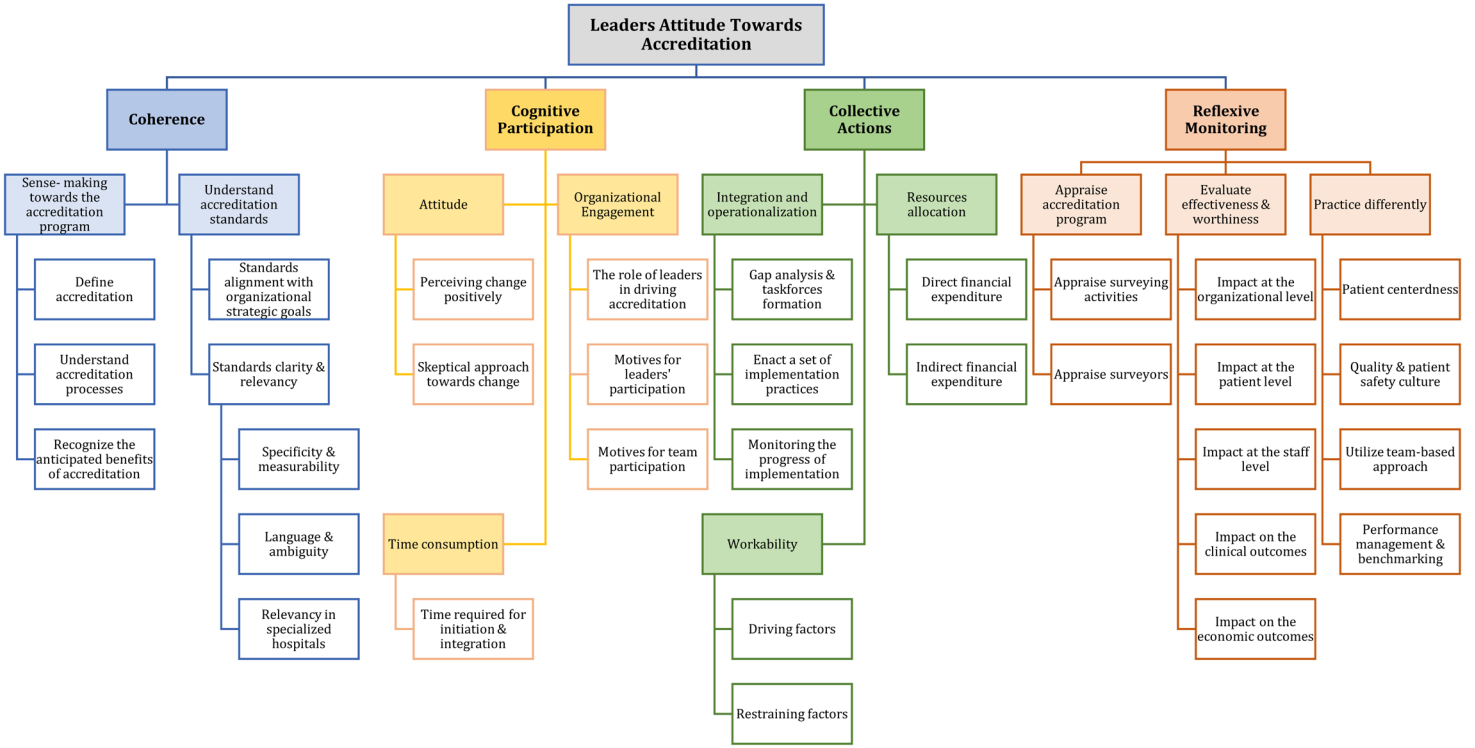
APPENDIX B1: Interview Guide - *the attitude of Saudi hospital directors towards normalizing accreditation standards.*

Hospital characteristics	**Participant demographics**
Hospital sector	Educational background
Type of hospital (i.e., specialization)	Level of education
Total number of active beds	Gender
Name of accrediting body & number of cycles	Job Title
Accredited? If yes, total years of being accredited	Total years of experience
Number of quality management staff in the hospital	Years of experience in the current position

Coherence / Sense-Making	
Question 1:	**Would you tell me about your accreditation experience?** **Probing Questions:** - In how many accreditation cycles have you participated in your experience? - What hospital accreditation programs have you participated in?
Question 2:	**What is the purpose of accreditation from your perspective?** **Probing Questions:** - Is the accreditation process aligned with strategic priorities and goals in your hospital? - What are the potential values anticipated from participating in accreditation programs?
Question 3:	**Did accreditation affect the nature of your work?** **Probing Questions:** - How useful did you find accreditation standards in doing things different than usual? - How would you perceive accreditation if it is an optional program?
Cognitive Participation / Engagement	
Question 4:	**Would you describe your role in the accreditation journey at your hospital?** **Probing Questions:** - How would you describe your approach to working with accreditation tasks? - At a personal level, what was the main motivator for your participation in accreditation?
Question 5:	**How much time has your hospital spent in understanding and working on accreditation standards at the preparatory phase?** **Probing Questions:** - How do you perceive the clarity and the focus of accreditation standards?
Question 6:	**How do you describe the engagement of your hospital in internal and external accreditation activities?** **Probing Questions:** - Describe internal and external engagements with accreditation activities? - What factors encouraged employee engagement in the accreditation journey at your hospital?
Collective Action / Implementation	
Question 7:	**What task have you had during working on meeting accreditation standards?** **Probing Questions:** - How do you describe your participation level in accreditation standards implementation?
Question 8:	**What interventions/actions have been taken in your hospital to implement accreditation standards?** **Probing Questions:** - Was additional training or external consultation needed during accreditation implementation? - How accreditation preparation tasks were allocated to various departments, units, & individuals?

Reflexive monitoring / Appraisal	
Question 9:	**How do you think accreditation affected the quality of service in your hospital?** **Probing Questions:** - How accreditation has affected your hospital at organizational, customer, staff, and outcome levels? - Did you experience any unintended consequences of the accreditation process? - What values were you anticipating from the accreditation survey that did not come true?
Question 10:	**How do you perceive the process of the on-site accreditation visit?** **Probing Questions:** - How do you perceive the accreditation evaluation process? - How do you perceive the accreditation surveyor's reliability? - To which extent accreditation standards are clear and relevant to your hospital setting?
CLOSING	**Is there anything else you would like me to know?**

APPENDIX B2: Coding Tree - *the attitude of Saudi hospital directors towards normalizing accreditation standards.*



APPENDICES C:
ADDITIONAL INFORMATION FOR CHAPTER 4

APPENDIX C1: Interview Guide

An evaluation of the driving and restraining factors affecting the implementation of hospital accreditation standards: a force field analysis.

Hospital characteristics	**Participant demographics**
Hospital sector	Educational background
Type of hospital (i.e., specialization)	Level of education
Total number of active beds	Gender
Name of accrediting body & number of cycles	Job Title
Accredited? If yes, total years of being accredited	Total years of experience
Date of the last accreditation visit	Years of experience in the current position

Question 1:	**Would you tell me about your accreditation experience?** **Probing Questions:** - In how many accreditation cycles have you participated in your experience? - What hospital accreditation programs have you participated in?
Question 2:	**Would you describe your role in the accreditation journey at your hospital?** **Probing Questions:** - What task have you had during working on meeting accreditation standards? - How do you describe your participation level in accreditation standards implementation? - At a personal level, what was the main driving factor for your participation in accreditation?
Question 3:	**How much time has your hospital spent in understanding and working on accreditation standards at the preparatory phase?** - To which extent accreditation standards are relevant to your hospital setting? - How do you perceive the clarity and the focus of accreditation standards?
Question 4:	**How do you describe the engagement of your hospital in external accreditation activities?** **Probing Questions:** - To which extent accreditation program enhance stakeholder agreement? - Describe internal (e.g., individually or departmentally) and external (e.g., with accrediting body or stakeholders) engagements with accreditation activities? - What factors encouraged employee engagement in the accreditation journey at your hospital?
Question 5:	**What are the factors enabling the effective implementation of accreditation in your hospital?** **Probing Questions:** - What motivates your hospital to implement accreditation standards? - What are the internal and external promotors of hospital accreditation? - What are your hospital's characteristics that facilitate adopting accreditation programs?
Question 6:	**What are the factors that restricted the implementation of hospital accreditation in your hospital?** **Probing Questions:** - What are the internal and external challenges in implementing accreditation standards?
CLOSING	**Is there anything else you would like me to know?**

APPENDIX C2: Calculation of Thematic Saturation

Saturation assessment based on:

- Base size 6,
- Run length 3,
- New information threshold 0%.

Interview number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
New codes per interview	8	4	4	5	2	1	2	1	1	1	0	1	2	0
New codes in run						24			4		2		3	
% change over the base									17%		8%		13%	

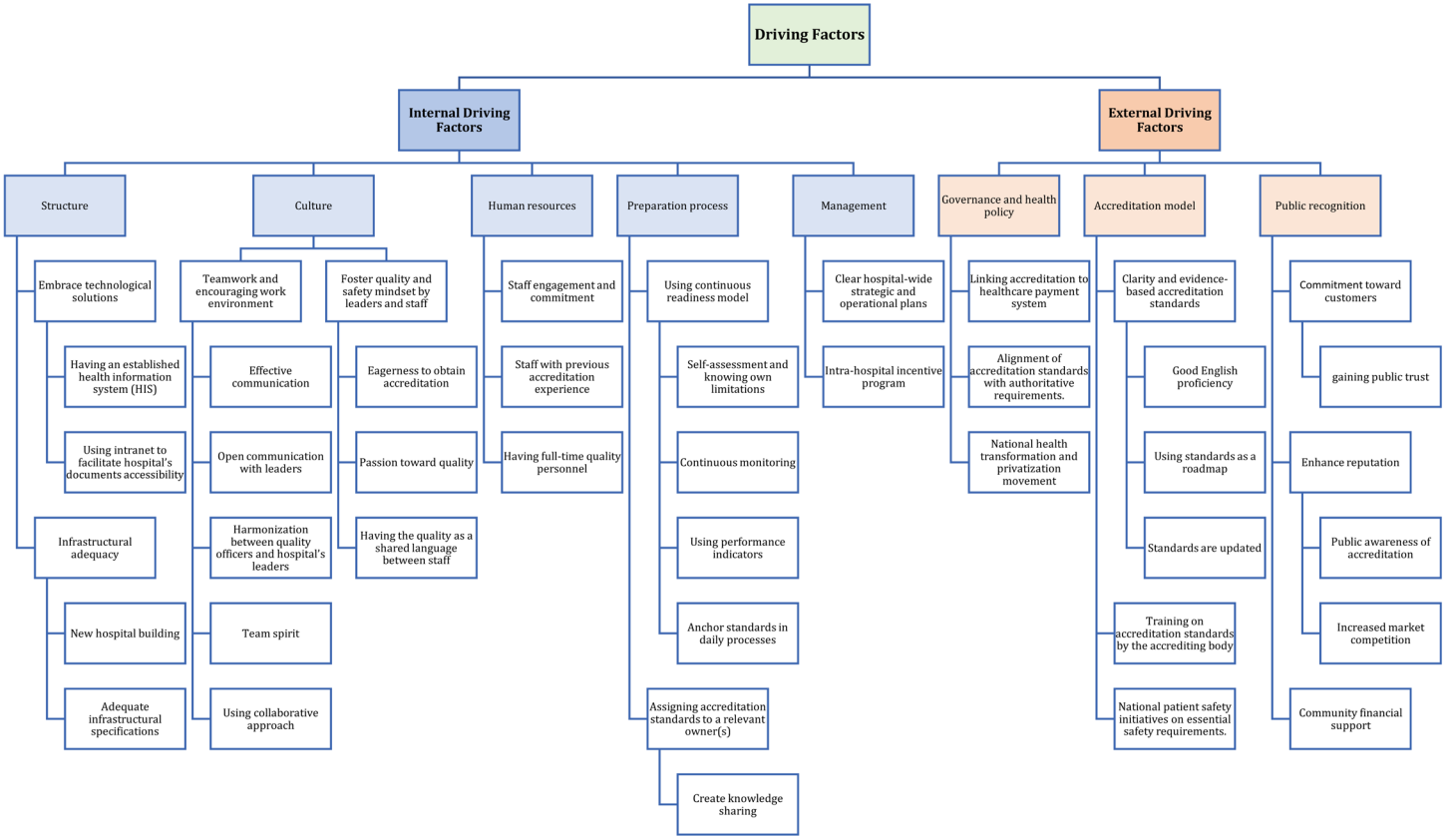
Interview number	15	16	17	18	19	20	21	22	23	24	25	26	27	28
New codes per interview	0	1	1	0	1	1	0	0	1	0	1	1	0	0
New codes in run	2		2		2		2		1		2		2	
% change over the base	8%		8%		8%		8%		4%		8%		8%	

Interview number	29	30	31	32	33	34	35	36	37	38	39	40	41	42
New codes per interview	1	0	0	1	0	0	1	0	0	0	0	0	0	0
New codes in run	1		1		1		1		1		0		0	
% change over the base	4%		4%		4%		4%		4%		**0%**		0%	

Interview number	43	44	45	46	47	48	49	50	51	52	53	54	55	56	Total
New codes per interview	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
New codes in run	0		0		0		0		0		0		0		-
% change over the base	0%		0%		0%		0%		0%		0%		0%		-

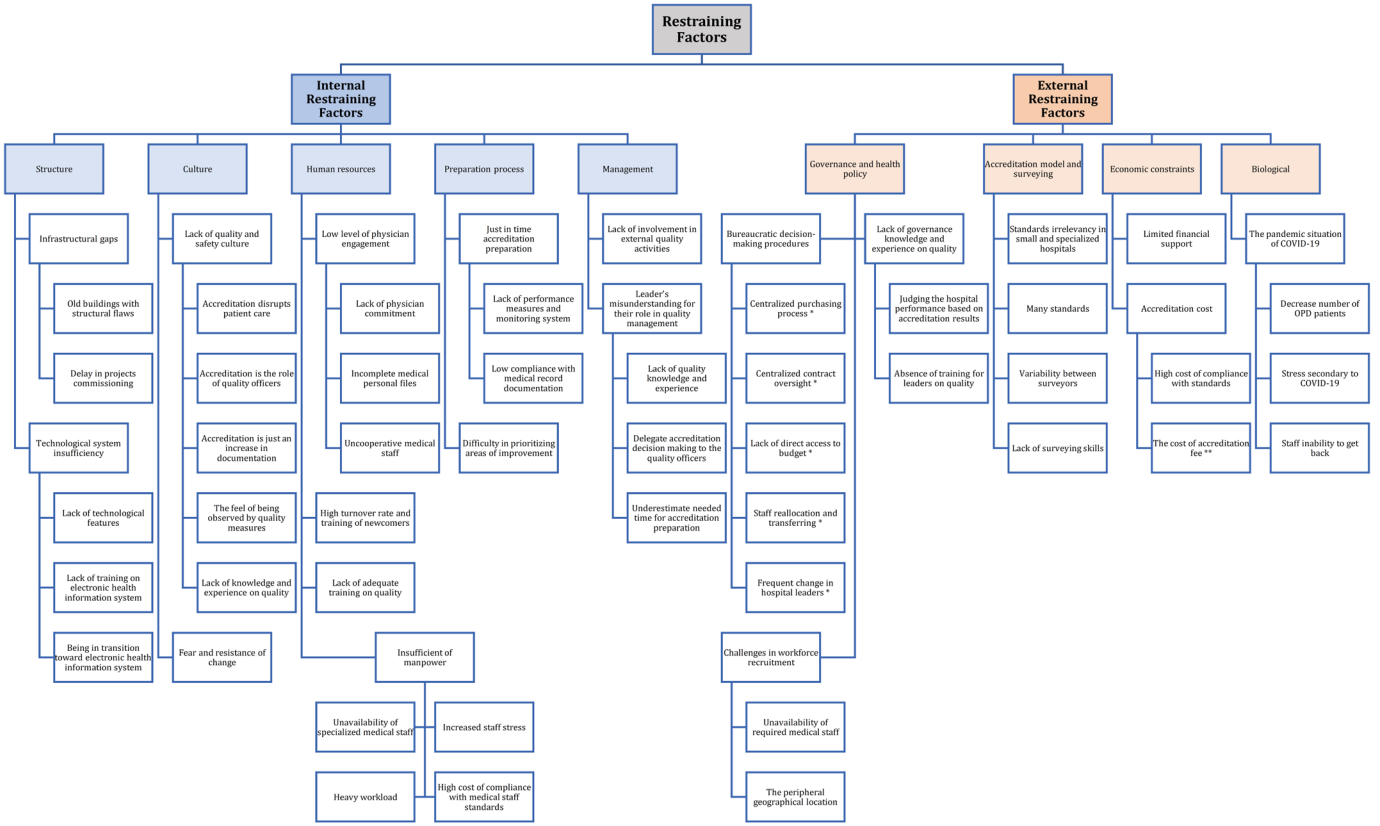
APPENDIX C3: Coding Tree – Driving Factors

An evaluation of the driving and restraining factors affecting the implementation of hospital accreditation standards: a force field analysis.



APPENDIX C4: Coding Tree – Restraining Factors

An evaluation of the driving and restraining factors affecting the implementation of hospital accreditation standards: a force field analysis.



** Reported in public hospitals. ** Reported in private hospitals.*

APPENDICES D:
ADDITIONAL INFORMATION FOR CHAPTER 5

APPENDIX D1: Accreditation Sustainability Questionnaire

Section 1: General Information

(please answer the following questions regarding your demographics and the characteristics of your hospital)

What is your gender?
☐ Male
☐ Female

What is your age?
_____

How many years of experience do you have in the healthcare field?
_____

What is your professional background?
☐ Health/Hospital Administration
☐ Physician
☐ Nurse
☐ Pharmacist
☐ Others: specify _____

What accreditation models have you worked with?
... *select all apply*
☐ CBAHI
☐ Joint Commission (JCIA)
☐ Accreditation Canada
☐ Others; specify_____

What best describes your hospital?
☐ Public general hospital
☐ Public specialized hospital
☐ Private general hospital
☐ Private specialized hospital
☐ Others: specify_____

What is your educational level?
☐ Diploma
☐ Bachelor
☐ Master
☐ PhD
☐ Others: _____

How many years of experience do you have in the quality management and accreditation field?
_____

Do you have any credentials in quality management or accreditation?
☐ No
☐ Yes
If yes, specify_____

APPENDIX D1: Accreditation Sustainability Questionnaire

Section 2: Sustainability of Hospital Accreditation

(for those recommendations that you believe have some degree of importance in terms of strengthening the sustainability of the hospital accreditation program, please indicate the level of importance. If you don't think a recommendation is important, simply check the box "Not at all important".)

		Recommendations	1 Not at all important	2 Slightly important	3 Moderately important	4 Important	5 Very important	I don't know
ACCREDITATION POLICIES	1	Aligning accreditation standards with the requirements of other levers in the country	☐	☐	☐	☐	☐	☐
	2	Adopting a mandatory accreditation scheme.	☐	☐	☐	☐	☐	☐
	3	Assuming unannounced accreditation visits.	☐	☐	☐	☐	☐	☐
	4	Integrating consumer perspectives/ judgments in all aspects of accreditation including decisions.	☐	☐	☐	☐	☐	☐
	5	Strengthen the health licensure system and other prerequisites of national accreditation.	☐	☐	☐	☐	☐	☐
	6	Automation of accreditation processes (e.g., online registration, data collection, and monitoring).	☐	☐	☐	☐	☐	☐
STANDARDS DEVELOPMENT	1	Updating standards periodically to reflect current best practices and research.	☐	☐	☐	☐	☐	☐
	2	Adopting technically tailored standards in response to major national adverse events.	☐	☐	☐	☐	☐	☐
	3	Involving partners from outside the healthcare industry in standards development	☐	☐	☐	☐	☐	☐
	4	Involving service users and policymakers in standard development	☐	☐	☐	☐	☐	☐
	5	Shifting the focus of standards from structure and compliance to outcomes and improvement.	☐	☐	☐	☐	☐	☐
	6	Embracing environmental-friendly standards (i.e., standards supporting eco-friendly guidelines)	☐	☐	☐	☐	☐	☐

		Recommendations	1 Not at all important	2 Slightly important	3 Moderately important	4 Important	5 Very important	I don't know
EVALUATION METHODS	1	Emerging telehealth and artificial intelligence in accreditation evaluation.	☐	☐	☐	☐	☐	☐
	2	Using a combination of onsite & off-site evaluation (i.e. hybridized)	☐	☐	☐	☐	☐	☐
	3	Integrating patient-reported outcomes into the evaluation process.	☐	☐	☐	☐	☐	☐
	4	Using the tracer methodology to assess compliance	☐	☐	☐	☐	☐	☐
	5	Utilizing the results of surveys (e.g. safety culture survey) to assess compliance with some aspects.	☐	☐	☐	☐	☐	☐
	6	Substituting snapshot evaluation by continuous clinical performance triggers to assess compliance with standards.	☐	☐	☐	☐	☐	☐
EVALUATION TEAM	1	Recruiting surveyors based on robust selection criteria.	☐	☐	☐	☐	☐	☐
	2	Train surveyors effectively on the required evidence of standards compliance.	☐	☐	☐	☐	☐	☐
	3	Implementing strategies to minimize variations among surveyor teams	☐	☐	☐	☐	☐	☐
	4	Including a multidisciplinary surveying team during accreditation visits.	☐	☐	☐	☐	☐	☐
	5	The background of the surveyor team matches the hospital's scope of service.	☐	☐	☐	☐	☐	☐

APPENDIX D2: The questionnaire item-corrected total statistics

		Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Accreditation Policies			
1.	Aligning accreditation standards with the requirements of other levers in the country.	.368	.787
2.	Adopting a mandatory accreditation scheme.	.408	.785
3.	Assuming unannounced accreditation visits.	.311	.790
4.	Integrating consumer perspectives in all aspects of accreditation including decisions.	.357	.788
5.	Strengthen the health licensure system and other accreditation prerequisites.	.513	.779
6.	Automation of the accreditation process (e.g. online registration and monitoring).	.477	.781
Standards Development			
7.	Updating standards periodically to reflect current best practices and research.	.510	.781
8.	Adopting technically tailored standards in response to major national adverse events.	.363	.788
9.	Involving partners from outside the healthcare industry in standards development.	.390	.786
10.	Involving service users and policymakers in standard development.	.380	.787
11.	Shifting the focus of standards from structure and compliance to outcomes and improvement.	.343	.789
12.	Embracing environmental-friendly standards (i.e., standards supporting eco-friendly guidelines).	.386	.787
Evaluation Methods			
13.	Emerging telehealth and artificial intelligence in accreditation evaluation.	.395	.786
14.	Using a combination of onsite and off-site evaluation (i.e. hybridized).	**.195***	.796
15.	Integrating patient-reported outcomes into the evaluation process	.335	.789
16.	Using the tracer methodology to assess compliance.	**.165***	.797
17.	Utilizing the results of surveys (e.g. safety culture survey) to assess compliance with some aspects.	**.197***	.796
18.	Substituting snapshot evaluation by continuous clinical performance triggers.	.428	.784
Evaluation Team			
19.	Recruiting surveyors based on robust selection criteria.	**.149***	.800
20.	Train surveyors effectively on the required evidence of standards compliance.	.364	.787
21.	Implementing strategies to minimize variations among surveyor teams.	.300	.792
22.	Including multidisciplinary surveying team during accreditation visit.	.300	.793
23.	Matching the survey team members' expertise with the hospital's scope of service.	.301	.793

** corrected items indicating low shared covariance to the overall questionnaire internal consistency.*

APPENDIX D3: Principal Axis Factoring (PAF) Exploratory Factor Analysis Oblimin Rotated factor solution for the questionnaire items.

	Extracted Factors*			
	Accreditation policies	**Standards developing**	**Evaluation methods**	**Evaluation teams**
Strengthen the health licensure system and other accreditation prerequisites.	.867			
Automation of accreditation process (e.g. online registration and monitoring).	.835			
Integrating consumer perspectives in all aspects of accreditation including decisions.	.653			
Aligning accreditation standards with the requirements of other levers in the country.	.573			
Adopting a mandatory accreditation scheme.	.557			
Assuming unannounced accreditation visits.	.545			
Involving service users and policymakers in standard development.		.825		
Updating standards periodically to reflect current best practices and research.		.714		
Shifting the focus of standards from structure and compliance to outcomes and improvement.		.709		
Adopting technically tailored standards in response to major national adverse events.		.597		
Embracing environmental-friendly standards (i.e., standards supporting eco-friendly guidelines).		.546		
Involving partners from outside the healthcare industry in standards development.		.429		
Substituting snapshot evaluation by continuous clinical performance triggers.			.822	
Integrating patient-reported outcomes into the evaluation process.			.765	
Using a combination of onsite and off-site evaluation (i.e. hybridized).			.659	
Emerging telehealth and artificial intelligence in accreditation evaluation.			.642	
Utilizing the results of surveys (e.g. safety culture survey) to assess compliance with some aspects.			.528	
Using the tracer methodology to assess compliance.			.503	
Train surveyors effectively on the required evidence of standards compliance.				.918
Implementing strategies to minimize variations among surveyor teams.				.775
Including multidisciplinary surveying team during accreditation visit.				.709
Recruiting surveyors based on robust selection criteria.				.694
Matching the survey team members' expertise with the hospital's scope of service.				.597

** Extraction Method: Principal Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization.*

APPENDIX D4: Multivariate linear regression analysis of the perceived importance of recommended improvements

Multivariate linear regression analysis of the perceived importance of recommended improvements to *accreditation policies*.

	Standardized β Coefficient	95% CI for β coefficient		p-value
		Lower	Upper	
(Constant)	2.091	1.156	3.027	<0.001
Sex, male	.151	-.084	.385	.206
Educational level, higher education	.285	.068	.503	***.011***
Professional background	-.016	-.066	.034	.529
Having credentials in quality management	.198	-.093	.489	.180
Hospital sector, private	-.078	-.313	.157	.513
Experience in national & international accreditation	.592	.197	.987	***.004***
Years of experience in quality management	.120	.007	.232	***.037***
Perceived importance of standards development	.083	-.083	.250	.325
Perceived importance of evaluation methods	-.184	-.332	-.036	***.015***
Perceived importance of evaluation team	-.104	-.227	.019	.096

Dependent variable: mean perceived importance of the accreditation policies score. Model R=0.641, adjusted R-square=0.327

Multivariate linear regression analysis of the perceived importance of recommended improvements to *standards development*.

	Standardized β Coefficient	95% CI for β coefficient		p-value
		Lower	Upper	
(Constant)	2.716	1.880	3.552	.000
Sex, male	-.016	-.250	.217	.891
Educational level, higher education	-.238	-.454	-.022	***.031***
Professional background	-.029	-.077	.019	.237
Having credentials in quality management	-.008	-.292	.275	.953
Hospital type	.059	-.035	.153	.217
Experience in national & international accreditation	-.171	-.565	.222	.391
Years of experience in quality management	.246	.142	.350	***<0.001***
Perceived importance of accreditation policies	.071	-.088	.230	.379
Perceived importance of evaluation methods	-.023	-.168	.122	.752
Perceived importance of evaluation team	-.159	-.276	-.043	***.008***

Dependent variable: mean perceived importance of standards development score. Model R=0.587, adjusted R-square= 0.299

Multivariate linear regression analysis of the perceived importance of recommended improvements to *evaluation methods*.

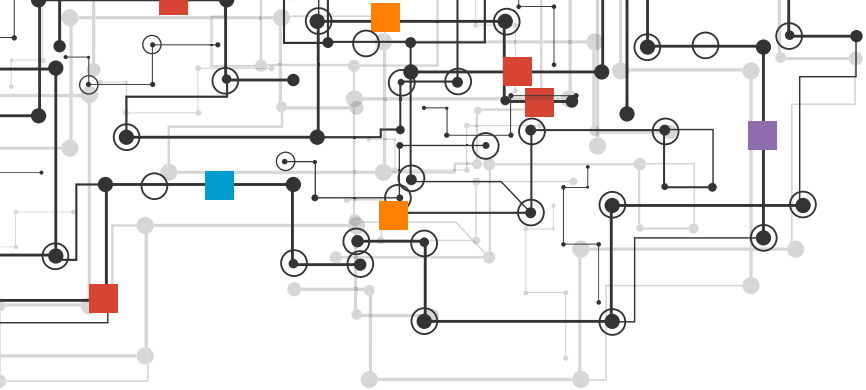
	Standardized β Coefficient	95% CI for β coefficient		p-value
		Lower	Upper	
(Constant)	3.576	2.695	4.458	<0.001
Sex, male	-.110	-.362	.141	.388
Professional background	-.034	-.088	.019	.207
Having credentials in quality management	.365	.055	.675	***.021***
Hospital sector, private	-.239	-.490	.012	.062
Experience in national & international accreditation	-.315	-.746	.116	.151
Years of experience in quality management	.268	.154	.381	***<0.001***
Perceived importance of accreditation policies	-.213	-.382	-.044	***.014***
Perceived importance of standards development	-.022	-.201	.156	.805
Perceived importance of evaluation team	-.258	-.385	-.131	***<0.001***

Dependent variable: mean perceived importance of evaluation methods score. Model R=0.558, adjusted R-square=0.269

Multivariate linear regression analysis of the perceived importance of recommended improvements to the *evaluation team*.

	Standardized β Coefficient	95% CI for β coefficient		p-value
		Lower	Upper	
(Constant)	4.898	3.816	5.981	<0.001
Sex, male	-.186	-.495	.124	.238
Professional background	-.049	-.114	.016	.137
Having credentials in quality management	.337	-.041	.716	.080
Hospital sector, private	-.480	-.895	-.065	***.024***
Hospital type	-.124	-.294	.047	.154
Experience in national & international accreditation	-.422	-.944	.100	.112
Years of experience in quality management	.369	.233	.504	***<0.001***
Perceived importance of accreditation policies	-.175	-.383	.033	.099
Perceived importance of standards development	-.255	-.468	-.041	***.020***
Perceived importance of evaluation methods	-.386	-.574	-.199	***<0.001***

Dependent variable: mean perceived importance of evaluation teams score. Model R=0.552, adjusted R-square=0.257



SUMMARY

Accreditation is the independent evaluation and official recognition of organizational performance against pre-defined standards. Accreditation is frequently used in a variety of industries, including healthcare. In healthcare, accreditation has become an important component of the quality system. It is a mechanism through which the adherence of healthcare organizations to quality of care standards is assessed by an external entity. Although accreditation was initially introduced as a voluntary program offered by non-governmental organizations, several countries today use it as a governmental regulatory arm. Some countries have empowered accreditation a step further by mandating the program or presenting it as a tool for reimbursement incentives. The justification rests on the belief that incorporating accreditation standards into daily hospital operations improves various aspects of service quality, including structure, process, and outcomes.

In Saudi Arabia, CBAHI is the authorized body to set accreditation standards, evaluate the compliance of healthcare facilities, and grant accreditation status accordingly. The hospital accreditation program was established to improve the quality of hospital services. It is mandatory in nature and linked to the national reimbursement system. In this, accredited hospitals are paid an additional incentive fee for adhering to quality principles implementation. The hospital accreditation program comprises a set of evidence-based standards that are periodically updated. However, hospitals in Saudi Arabia encounter various obstacles that hinder the implementation of accreditation standards. Evidence on the impact of hospital accreditation on the quality of service, challenges, motivators, and mechanisms of implementing accreditation standards at Saudi Arabia's hospitals is scarce. Therefore, the central aim of this dissertation is to understand hospital accreditation in Saudi Arabia in order to leverage its prospects for improvement. The dissertation offers answers to how accreditation programs affect the quality of service in hospitals in Saudi Arabia, what factors influence the implementation of accreditation standards, how healthcare leaders perceive the implementation of accreditation standards, and what improvements are needed to sustain accreditation among other performance improvement tools in healthcare industries. These answers assist in a better understanding of the current and future status of hospital accreditation in the Saudi context. The dissertation consists of six chapters, which are summarized herein as follows.

Chapter 1 provides an overview of the hospital accreditation approach applied

internationally and in the Saudi context. It also offers a general view of the impact of accreditation and the challenges associated with the implementation of accreditation standards in various contexts. Also, the chapter presents the research gaps concerning accreditation in Saudi Arabia. Further, the chapter outlines the central aim, objectives, and methodology approaches applied throughout this dissertation.

In **Chapter 2**, a systematic review of the literature is provided to identify and analyze the evidence on the effect of hospital accreditation on health outcomes and the quality of healthcare services. In this review, 12 electronic databases were searched, including PubMed, CINAHL, PsycINFO, EMBASE, MEDLINE (OvidSP), CDSR, CENTRAL, ScienceDirect, SSCI, RSCI, SciELO, and KCI. In searching databases, appropriate subject headings and terms were used to ensure the detection and extraction of relevant publications for the review. There were no restrictions placed on the search in terms of the design and language of the publications. In addition, Google scholar and the websites of the prominent accrediting bodies were searched to ensure that no important studies were overlooked. The review included peer-reviewed quantitative studies that were published over the last two decades (2000 – 2020), as explained in Chapter 2. The review followed the PRISMA guidelines to comprehensively report the wide array of detected studies. In this, two reviewers independently screened initially identified articles, reviewed the full text of potentially relevant studies, retrieved necessary data, and assessed the methodological rigor of the included studies using a validated tool.

In total, 17830 studies were screened, of which 76 empirical studies on the impact of accreditation met the inclusion criteria and were included in the analysis. Despite the fact that the included studies were methodologically heterogeneous, findings were synthesized and categorized thematically into six themes. As detailed in Chapter 2, the impact themes were changes in organizational culture and management, changes at the professional level, changes at the patient level, changes in patient clinical outcomes, changes in the quality of services, and changes in economic outcomes. The results in Chapter 2 indicated that a positive accreditation effect was found in more than 55% of the included studies. Consistent positive effects of accreditation were found in process-related quality measures, safety culture, hospital efficiency, and patient length of stay. In contrast, staff job stress was found to be consistently negatively affected. Contradictory results concerning the impact of accreditation on mortality and healthcare-associated infection hampered the

drawing of firm conclusions on those outcome measures. Staff job satisfaction, patient satisfaction and experience, and 30-day readmission rate were found to be unrelated to accreditation. In conclusion, Chapter 2 underscored the notion that compliance with accreditation standards offers several plausible benefits in improving the quality of healthcare services and outcomes. At the policy level, synchronizing accreditation with other health policies assists in institutionalizing performance gains. Hence, exploring the mechanisms through which accreditation standards are incorporated and routinized in daily operations is beneficial to the process of standards institutionalization. This has been further studied and reported in Chapter 3.

Chapter 3 rigorously explored the attitude of hospital directors toward accreditation. Also, the chapter investigated the mechanisms of normalizing standards in Saudi Arabian hospitals. The findings in this chapter were based on semi-structured interviews with 15 hospital directors from around Saudi Arabia. The inclusion was limited to hospitals that had had one accreditation visit and had been, subsequently, accredited for at least six months prior to the interview. In this research, the interviews were directed using an interview guide, conducted virtually using the Zoom videoconferencing platform during the period May to June 2021, and audiotaped after getting informed consent from each interviewee. Thereafter, the interviews were transcribed verbatim and analyzed thematically using the NVivo-12 software package. The normalization process theory (NPT) was adopted as an explorative model to heuristically describe the findings on normalizing accreditation standards. Consequently, emerging themes were taxonomically sorted under the NPT constructs (i.e. coherence, cognitive participation, collective actions, and reflexive monitoring).

According to the findings presented in Chapter 3, hospital directors perceived the hospital accreditation program favorably, particularly directors with more experience or previous exposure to accreditation. As argued in Chapter 3, the clarity of accreditation standards, availability of full-time quality professionals, and alignment of accreditation standards with hospital strategies assisted hospital directors in making sense of accreditation (coherence) and moving towards engaging hospital teams in the process (cognitive participation). The engagement of teams, consequently, assisted in integrating standards in operational activities (collective actions). As evidenced in Chapter 3, the integration process comprised distributing standard sets to relevant owners, conducting gap analysis, constructing a corrective plan, and prioritizing tasks within timeframes. Following integration, the objective

evaluation of accreditation benefits (reflexive monitoring) was critical to address what went wrong and what worked well. Also, the study findings indicated that the integration of accreditation standards resulted in an enhanced organizational safety culture, team spirit, communication, public trust, and standardizing of procedures, despite experiencing several challenges during the integration of standards. In conclusion, the effectiveness of integrating accreditation standards heavily relies on making sense of accreditation and understanding the mechanisms through which standards are routinized into business operations. Further, the study showed that the phases of standards integration are sequential, interlinked, and influenced by culture, teamwork, and leadership engagement. The above challenges have been addressed in Chapter 4 as well.

Chapter 4 investigated the driving and restraining factors that influenced the implementation of the national accreditation standards in Saudi Arabian hospitals. The findings in this chapter were based on semi-structured in-depth qualitative interviews with 27 hospital directors and 29 hospital quality directors. In April-June 2021, the interviews were conducted and recorded virtually using the Zoom videoconferencing platform. The interviews were then transcribed verbatim and analyzed thematically. The thematic analysis of the 56 interviews yielded 42 factors that influence the accreditation standards implementation. These factors were synthesized into 17 themes that were tabulated into 4 categories: internal and external drivers and internal and external restrainers. The force-field analysis framework was adopted in this chapter to illustrate the results by providing a comprehensive visual map that depicts the balance of opposing factors that influence the implementation of the standards.

The findings presented in Chapter 4 revealed that teamwork, the mindset of leaders and staff toward quality, the use of the continuous accreditation readiness model, and commitment toward customers were the most significant driving factors. On the contrary, the main restrainers reported were insufficient manpower, infrastructural gaps, workforce recruitment challenges, variability among surveyors, the pandemic situation of COVID-19, limited financial support, and bureaucratic decision-making procedures. As depicted in Chapter 4, the force-field analysis framework showed an equilibrium state between the counteracting driving and restraining forces based on the number and significance of these factors. This finding indicates that the implementation of accreditation standards using the existing accreditation model is faced with serious challenges that hinder the sustainability of the accreditation

model. The chapter emphasized the fact that identifying driving and restraining forces that affect the process of standards implementation helps in assessing the readiness to pursue accreditation, prioritizing the efforts at macro and micro levels, and increasing the eventuality of institutionalizing accreditation standards. Hence, to strengthen drivers and weaken restrainers, several changes need to be introduced to accreditation processes. These improvement changes have been further explored in Chapter 5.

Chapter 5 examined what improvements are important to enhance the sustainability of the hospital accreditation model in Saudi Arabia from the perspective of hospital quality managers. The findings in Chapter 5 are drawn quantitatively using a cross-sectional questionnaire that was developed, tested, piloted, and factorially validated. In July-August 2022, a total of 158 respondents rated the importance of recommended improvements that are proposed to enhance the sustainability of accreditation policies, standards development, evaluation methods, and the evaluation team. The importance of the recommendations, according to the respondents, was described in the study using the relative importance index. In contrast, multivariate linear regression was used to analyze the association with independent variables.

The findings presented in Chapter 5 revealed that the overall mean importance attached to improving standards development, accreditation policies, evaluation team, and evaluation methods were 3.55, 3.43, 3.41, and 3.21, on a 5-point Likert scale, respectively. The results suggested that shifting the focus of accreditation standards from structure and compliance to outcomes and improvement, updating standards periodically to reflect current best practices and research, and integrating consumer perspectives in all aspects of accreditation were the most important perceived recommendations. Furthermore, the multivariate regression analysis yielded that managers with more years of experience had significantly higher mean scores on the importance of improving accreditation policies, standards development, evaluation methods, and the evaluation team. The findings in this chapter emphasized the importance of introducing improvements to accreditation policies (e.g. integrating consumer perspectives in accreditation), standards development (e.g. shifting the focus of the standards to outcomes), evaluation methods (e.g. emerging artificial intelligence in accreditation evaluation), and evaluation team (e.g. reducing inter-surveyor variability). The findings reported in Chapter 5 helped to better understand how to preserve the future relevance of

accreditation models among other quality improvement tools. Also, the chapter encouraged accrediting bodies to produce an enhanced version of the accreditation scheme that can supplement other performance improvement tools in promoting the quality of healthcare services.

In **Chapter 6**, the main findings of Chapters 2–5 were interpreted within the context of accreditation literature using supportive evidence from various contexts. These interpretations were followed by the policy and research implications at different levels. In the discussion chapter, the dissertation argued that compliance with accreditation standards contributes to improving the quality and safety of healthcare services. The argument was based on the study presented in Chapter 2, which found a reasonable positive impact of accreditation in terms of improving the quality of healthcare services and outcomes. Also, the phases of integrating hospital accreditation standards were discussed using the evidence in Chapter 3. In that, the dissertation supported the notion that recognizing the mechanisms through which accreditation standards are integrated into operations is critical to understanding how accreditation works. Furthermore, given the fact that integrating accreditation standards is influenced by numerous driving and restraining forces. The dissertation used the findings presented in Chapter 4 to provide evidence on the factors affecting the integration of hospital accreditation standards in Saudi Arabia. This evidence is expected to help in assessing accreditation readiness and advancing the institutionalization of standards in Saudi Arabia. Finally, the discussion chapter used the study findings presented in Chapter 5 to emphasize the importance of improving the features of accreditation. The argument was that making improvements to the current accreditation scheme contributes to sustaining accreditation and preserving its future relevance.

In conclusion, the dissertation explored the working mechanism and the factors influencing the hospital accreditation system in Saudi Arabia, thus identifying opportunities for improvement in the current accreditation system. The systematic review, qualitative research, and quantitative research in this dissertation offered answers to how accreditation programs affect the quality of service, what factors influenced the integration of accreditation standards in Saudi Arabia, how Saudi healthcare leaders perceived the implementation of accreditation standards, and what improvements are needed to sustain accreditation among other performance improvement tools in Saudi Arabia. Although the studies were conducted in Saudi Arabia, the lessons learned present policymakers, accreditors, and stakeholders on

a large contextual scale with a better understanding of the accreditation system. Also, it provides evidence of improvements that may contribute to improving the sustainability and future relevance of accreditation. The implications of this dissertation are expected to be relevant to a broader scale due to the similarities between accreditation programs and the factors affecting them.

SAMENVATTING

Accreditatie is de onafhankelijke evaluatie en officiële erkenning van de prestaties van een organisatie aan de hand van vooraf vastgestelde normen. Accreditatie wordt gebruikt in verschillende sectoren, waaronder de gezondheidszorg. In de gezondheidszorg is accreditatie een belangrijk onderdeel van het kwaliteitszorgsysteem geworden. Het is een mechanisme waarmee de naleving van kwaliteitsnormen door zorginstellingen door een externe instantie wordt beoordeeld. Hoewel accreditatie aanvankelijk vrijwillig was en werd aangeboden door niet-gouvernementele organisaties, tegenwoordig is het in verschillende landen onderdeel van regulering door de overheid. Sommige landen hebben accreditatie een stap verder gebracht door het verplicht te stellen of het te presenteren als een instrument voor vergoedingsstimulansen. Dit is gebaseerd op de overtuiging dat het opnemen van accreditatienormen in de dagelijkse ziekenhuisactiviteiten verschillende aspecten van de kwaliteit van de dienstverlening verbetert, waaronder structuur, processen en resultaten.

In Saoedi-Arabië is de CBAHI de bevoegde instantie om accreditatienormen vast te stellen, te beoordelen of zorginstellingen aan de normen voldoen en dienovereenkomstig de accreditatiestatus toe te kennen. Het programma voor ziekenhuisaccreditatie is opgezet om de kwaliteit van ziekenhuisdiensten te verbeteren. Het is verplicht en gekoppeld aan het nationale betaling systeem in de zorg. Hierin krijgen geaccrediteerde ziekenhuizen een extra stimuleringsvergoeding voor het naleven van de implementatie van kwaliteitsprincipes. Het programma voor ziekenhuisaccreditatie omvat een reeks op feiten gebaseerde normen die periodiek worden bijgewerkt. De ziekenhuizen in Saoedi-Arabië stuiten echter op verschillende obstakels die de toepassing van de accreditatienormen belemmeren. Gegevens over de impact van ziekenhuisaccreditatie op de kwaliteit van de dienstverlening, uitdagingen, motivatoren en mechanismen van de implementatie van accreditatienormen in Saudi-Arabische ziekenhuizen zijn schaars. Daarom is het belangrijkste doel van dit proefschrift ziekenhuisaccreditatie in Saoedi-Arabië te begrijpen om de vooruitzichten voor verbetering ervan te benutten. Het proefschrift biedt antwoorden op de vraag hoe accreditatieprogramma's de kwaliteit van de dienstverlening in ziekenhuizen in Saoedi-Arabië beïnvloeden, welke factoren de implementatie van accreditatienormen beïnvloeden, hoe leiders in de gezondheidszorg de implementatie van accreditatienormen percipiëren, en welke verbeteringen nodig zijn om accreditatie te behouden naast andere instrumenten

voor prestatieverbetering in de gezondheidszorg. Deze antwoorden dragen bij tot een beter begrip van de huidige en toekomstige status van ziekenhuisaccreditatie in de Saoedische context. Het proefschrift bestaat uit zes hoofdstukken, die hierin als volgt worden samengevat.

Hoofdstuk 1 geeft een overzicht van de aanpak van ziekenhuisaccreditatie die internationaal en in de Saudische context wordt toegepast. Het biedt ook een algemene kijk op de impact van accreditatie en de uitdagingen die gepaard gaan met de toepassing van accreditatienormen in verschillende contexten. Ook presenteert het hoofdstuk de lacunes in het onderzoek naar accreditatie in Saudi-Arabië. Verder schetst het hoofdstuk het centrale doel, de doelstellingen en de methodologische benaderingen die in dit proefschrift zijn toegepast.

In **Hoofdstuk 2** wordt een systematisch literatuuroverzicht gegeven om het bewijsmateriaal over het effect van ziekenhuisaccreditatie op gezondheidsresultaten en de kwaliteit van de gezondheidszorg te identificeren en te analyseren. Voor dit onderzoek werden 12 elektronische databanken doorzocht, waaronder PubMed, CINAHL, PsycINFO, EMBASE, MEDLINE (OvidSP), CDSR, CENTRAL, ScienceDirect, SSCI, RSCI, SciELO en KCI. Bij het zoeken in databanken werden de juiste onderwerptitels en termen gebruikt om ervoor te zorgen dat relevante publicaties voor het onderzoek werden opgespoord en geëxtraheerd. Er werden geen beperkingen gesteld aan de zoekopdracht wat betreft de opzet en methoden van onderzoek en de taal van de publicaties. Daarnaast werden Google scholar en de websites van de prominente accreditatie-instanties doorzocht om ervoor te zorgen dat geen belangrijke studies over het hoofd werden gezien. De review omvatte peer-reviewed kwantitatieve studies die in de afgelopen twee decennia (2000 - 2020) zijn gepubliceerd, zoals toegelicht in Hoofdstuk 2. De review volgde de PRISMA-richtlijnen om uitgebreid verslag te doen van het brede scala aan gedetecteerde studies. Daarbij hebben twee beoordelaars onafhankelijk van elkaar aanvankelijk geïdentificeerde artikelen gescreend, de volledige tekst van mogelijk relevante studies beoordeeld, de noodzakelijke gegevens opgehaald en de methodologische validiteit van de geïncludeerde studies beoordeeld met behulp van een gevalideerd instrument.

In totaal werden 17830 studies gescreend, waarvan 76 empirische studies over het effect van accreditatie aan de inclusiecriteria voldeden en in de analyse werden opgenomen. Ondanks het feit dat de opgenomen studies methodologisch

heterogeen waren, werden de bevindingen samengevat en thematisch ingedeeld in zes thema's. Zoals uiteengezet in Hoofdstuk 2 waren de thema's veranderingen in organisatiecultuur en management, veranderingen op professioneel niveau, veranderingen op patiëntniveau, veranderingen in klinische resultaten van patiënten, veranderingen in de kwaliteit van de dienstverlening, en veranderingen in economische resultaten. De resultaten in Hoofdstuk 2 gaven aan dat in meer dan 55% van de geïncludeerde studies een positief accreditatie-effect werd gevonden. Consistente positieve effecten van accreditatie werden gevonden voor procesgerelateerde kwaliteitsmaatregelen, veiligheidscultuur, ziekenhuisefficiëntie en verblijfsduur van patiënten. Werkstress bij het personeel bleek daarentegen consequent een negatief effect te hebben. Tegenstrijdige resultaten over het effect van accreditatie op sterfte en zorginfecties belemmerden het trekken van duidelijke conclusies over deze uitkomstmaten. De arbeidstevredenheid van het personeel, de tevredenheid en ervaring van de patiënten en het aantal 30-daagse heropnames bleken geen verband te houden met accreditatie. Concluderend kan worden gesteld dat Hoofdstuk 2 het idee heeft onderstreept dat de naleving van accreditatienormen verschillende aannemelijke voordelen biedt voor de verbetering van de kwaliteit van de gezondheidsdiensten en -resultaten. Op beleidsniveau helpt het synchroniseren van accreditatie met ander gezondheidsbeleid bij het institutionaliseren van prestatieverbeteringen. Daarom is het onderzoeken van de mechanismen waarmee accreditatienormen in de dagelijkse werkzaamheden worden opgenomen en geroutineerd, gunstig voor het proces van institutionalisering van de normen. Dit is nader bestudeerd en gerapporteerd in Hoofdstuk 3.

Hoofdstuk 3 onderzocht de houding van ziekenhuisdirecteuren ten opzichte van accreditatie. Ook onderzocht het hoofdstuk de mechanismen van normering in Saoedi-Arabische ziekenhuizen. De bevindingen in dit hoofdstuk zijn gebaseerd op semi-gestructureerde interviews met 15 ziekenhuisdirecteuren uit heel Saoedi-Arabië. De inclusie was beperkt tot ziekenhuizen die één accreditatiebezoek hadden gehad en vervolgens minstens zes maanden voor het interview geaccrediteerd waren. In dit onderzoek werden de interviews geleid met behulp van een interviewgids, virtueel afgenomen met behulp van het Zoom-videoconferentieplatform in de periode mei tot juni 2021, en auditief opgenomen na geïnformeerde toestemming van elke geïnterviewde. Daarna werden de interviews verbatim getranscribeerd en thematisch geanalyseerd met behulp van het softwarepakket NVivo-12. De normalisatieprocestheorie (NPT) werd gebruikt als exploratief model om de bevindingen over het normaliseren van accreditatienormen heuristisch te

beschrijven. Bijgevolg werden de opkomende thema's taxonomisch gesorteerd onder de constructen van de NPT (d.w.z. coherentie, cognitieve participatie, collectieve acties en reflexieve controle).

Volgens de bevindingen in Hoofdstuk 3 oordeelden ziekenhuisdirecteuren positief over het accreditatieprogramma, vooral directeuren met meer ervaring of eerdere kennismaking met accreditatie. Zoals aangetoond in Hoofdstuk 3, hielpen de duidelijkheid van de accreditatienormen, de beschikbaarheid van fulltime kwaliteitsmedewerkers en de afstemming van de accreditatienormen op de ziekenhuisstrategieën de ziekenhuisdirecteuren om de accreditatie te begrijpen (coherentie) en om de ziekenhuisteams bij het proces te betrekken (cognitieve participatie). De betrokkenheid van de teams hielp bijgevolg bij de integratie van de normen in de operationele activiteiten (collectieve acties). Zoals blijkt uit Hoofdstuk 3, omvatte het integratieproces het verspreiden van normensets onder de relevante eigenaren, het uitvoeren van een kloofanalyse, het opstellen van een correctieplan en het stellen van prioriteiten binnen tijdskaders. Na de integratie was de objectieve evaluatie van de accreditatievoordelen (reflexieve monitoring) van cruciaal belang om na te gaan wat fout ging en wat goed werkte. De onderzoeksresultaten wezen er ook op dat de integratie van accreditatienormen resulteerde in een verbeterde veiligheidscultuur van de organisatie, teamgeest, communicatie, vertrouwen van het publiek, en standaardisering van procedures, ondanks het feit dat de integratie van normen met verschillende uitdagingen gepaard ging. Kortom, de doeltreffendheid van de integratie van accreditatienormen hangt sterk af van de zin van accreditatie en het inzicht in de mechanismen waarmee normen in de bedrijfsvoering worden geïntegreerd. Verder bleek uit het onderzoek dat de fasen van normintegratie opeenvolgend zijn, met elkaar samenhangen en beïnvloed worden door cultuur, teamwerk en leiderschap. De bovengenoemde uitdagingen zijn ook in Hoofdstuk 4 behandeld.

Hoofdstuk 4 onderzocht de drijvende en remmende factoren die de implementatie van de nationale accreditatienormen in Saudi-Arabische ziekenhuizen beïnvloedden. De bevindingen in dit hoofdstuk waren gebaseerd op semi-gestructureerde diepgaande kwalitatieve interviews met 27 ziekenhuisdirecteuren en 29 kwaliteitsdirecteuren van ziekenhuizen. In april-juni 2021 werden de interviews virtueel afgenomen en opgenomen met behulp van het Zoom-videoconferentieplatform. De interviews werden vervolgens woordelijk getranscribeerd en thematisch geanalyseerd. De thematische analyse van de 56 interviews leverde 42 factoren op die van invloed

zijn op de implementatie van de accreditatienormen. Deze factoren werden samengevat in 17 thema's die in 4 categorieën werden ondergebracht: interne en externe drijfveren en interne en externe belemmeringen. In dit hoofdstuk is het raamwerk van de krachtenveldanalyse gebruikt om de resultaten te illustreren door een uitgebreide visuele kaart te verstrekken die de balans weergeeft van tegengestelde factoren die de implementatie van de normen beïnvloeden.

Uit de bevindingen in Hoofdstuk 4 blijkt dat teamwerk, de mentaliteit van leiders en personeel ten aanzien van kwaliteit, het gebruik van het model voor continue accreditatiebereidheid en de betrokkenheid bij de klanten de belangrijkste stimulerende factoren waren. Als belangrijkste belemmeringen werden daarentegen genoemd: onvoldoende personeel, infrastructurele tekortkomingen, problemen bij de aanwerving van personeel, variabiliteit tussen de inspecteurs, de pandemische situatie van COVID-19, beperkte financiële steun en bureaucratische besluitvormingsprocedures. Zoals weergegeven in Hoofdstuk 4 toonde het kader voor de krachtenveldanalyse een evenwichtstoestand tussen de tegenwerkende drijvende en remmende krachten op basis van het aantal en het belang van deze factoren. Deze bevinding wijst erop dat de toepassing van accreditatienormen met behulp van het bestaande accreditatiemodel met ernstige uitdagingen wordt geconfronteerd die de duurzaamheid van het accreditatiemodel belemmeren. Het hoofdstuk benadrukt dat het in kaart brengen van de drijvende en remmende krachten die het proces van normimplementatie beïnvloeden, helpt bij het beoordelen van de bereidheid om accreditatie na te streven, het prioriteren van de inspanningen op macro- en microniveau, en het vergroten van de kans op institutionalisering van accreditatienormen. Om de drijvende krachten te versterken en de remmende factoren te verzwakken, moeten dus verschillende veranderingen in de accreditatieprocessen worden aangebracht. In Hoofdstuk 5 wordt nader ingegaan op deze verbeteringen.

In **Hoofdstuk 5** is onderzocht welke verbeteringen belangrijk zijn om de duurzaamheid van het model voor ziekenhuisaccreditatie in Saoedi-Arabië te vergroten vanuit het perspectief van de kwaliteitsmanagers van de ziekenhuizen. De bevindingen in Hoofdstuk 5 zijn kwantitatief en gabaseerd op een cross-sectionele vragenlijst die is ontwikkeld, getest, gepilot en factorieel gevalideerd. In juli-augustus 2022 beoordeelden in totaal 158 respondenten het belang van de aanbevolen verbeteringen die worden voorgesteld om de duurzaamheid van het accreditatiebeleid, de normontwikkeling, de evaluatiemethoden en

het evaluatieteam te verbeteren. Het belang van de aanbevelingen, volgens de respondenten, werd in de studie beschreven met behulp van de relatieve belangrijkheidsindex. Daarentegen werd multivariate lineaire regressie gebruikt om de associatie met onafhankelijke variabelen te analyseren.

Uit de bevindingen in Hoofdstuk 5 blijkt dat het gemiddelde belang dat werd gehecht aan de verbetering van de ontwikkeling van normen, het accreditatiebeleid, het evaluatieteam en de evaluatiemethoden respectievelijk 3,55, 3,43, 3,41 en 3,21 was op een 5-punts Likert-schaal. Uit de resultaten bleek dat het verschuiven van het accent van accreditatienormen van structuur en naleving naar resultaten en verbetering, het periodiek bijwerken van normen om de huidige beste praktijken en onderzoek te weerspiegelen, en het integreren van consumentenperspectieven in alle aspecten van accreditatie de belangrijkste aanbevelingen waren. Bovendien bleek uit de multivariate regressieanalyse dat managers met meer jaren ervaring significant hoger scoorden op het belang van verbetering van het accreditatiebeleid, de ontwikkeling van normen, evaluatiemethoden en het evaluatieteam. De bevindingen in dit hoofdstuk benadrukten het belang van verbeteringen in het accreditatiebeleid (bv. integratie van consumentenperspectieven in de accreditatie), normontwikkeling (bv. de focus van de normen verleggen naar uitkomsten), evaluatiemethoden (bv. de opkomst van kunstmatige intelligentie in de accreditatie-evaluatie) en het evaluatieteam (bv. vermindering van de variabiliteit tussen enquêteurs). De bevindingen in Hoofdstuk 5 helpen om beter te begrijpen hoe accreditatiemodellen in de toekomst relevant kunnen blijven naast andere instrumenten voor kwaliteitsverbetering. Ook moedigt het hoofdstuk de accreditatie-instanties aan om een verbeterde versie van de accreditatieregeling te produceren die een aanvulling kan vormen op andere instrumenten voor prestatieverbetering bij de bevordering van de kwaliteit van gezondheidsdiensten.

In **Hoofdstuk 6** werden de belangrijkste bevindingen van de hoofdstukken 2-5 geïnterpreteerd binnen de context van de accreditatieliteratuur aan de hand van ondersteunend bewijsmateriaal uit verschillende contexten. Deze interpretaties werden gevolgd door de beleids- en onderzoeksimplicaties op verschillende niveaus. In het discussiehoofdstuk werd betoogd dat naleving van accreditatienormen bijdraagt tot verbetering van de kwaliteit en veiligheid van de gezondheidszorg. Dit argument was gebaseerd op de in Hoofdstuk 2 gepresenteerde studie, waarin een redelijk positief effect van accreditatie werd gevonden wat betreft de verbetering van de kwaliteit van de zorgdiensten en -uitkomsten. Ook werden de fasen van

de integratie van ziekenhuisaccreditatienormen besproken aan de hand van het bewijsmateriaal in Hoofdstuk 3. Het proefschrift ondersteunde daarmee het idee dat het herkennen van de mechanismen waarmee accreditatienormen worden geïntegreerd in de bedrijfsvoering cruciaal is om te begrijpen hoe accreditatie werkt. Bovendien wordt de integratie van accreditatienormen beïnvloed door talrijke drijvende en remmende krachten. Het proefschrift gebruikte de bevindingen in Hoofdstuk 4 om bewijs te leveren voor de factoren die de integratie van ziekenhuisaccreditatienormen in Saoedi-Arabië beïnvloeden. Dit bewijs zal naar verwachting helpen bij het beoordelen van de accreditatiebereidheid en het bevorderen van de institutionalisering van normen in Saoedi-Arabië. Ten slotte werden in het discussiehoofdstuk de onderzoeksresultaten van Hoofdstuk 5 gebruikt om het belang van verbetering van de accreditatiekenmerken te benadrukken. Het argument was dat verbeteringen in de huidige accreditatieregeling bijdragen tot de instandhouding van accreditatie en het behoud van de toekomstige relevantie ervan.

Concluderend, het proefschrift onderzocht het werkingsmechanisme en de factoren die het ziekenhuisaccreditatiesysteem in Saoedi-Arabië beïnvloeden, en identificeerde zo mogelijkheden voor verbetering van het huidige accreditatiesysteem. De systematische review, het kwalitatieve onderzoek en het kwantitatieve onderzoek in dit proefschrift boden antwoorden op de vraag hoe accreditatieprogramma's de kwaliteit van de dienstverlening beïnvloeden, welke factoren van invloed waren op de integratie van accreditatienormen in Saoedi-Arabië, hoe leiders in de Saoedische gezondheidszorg de implementatie van accreditatienormen percipieerden, en welke verbeteringen nodig zijn om accreditatie naast andere instrumenten voor prestatieverbetering in Saoedi-Arabië in stand te houden. Hoewel de studies werden uitgevoerd in Saoedi-Arabië, bieden de geleerde lessen beleidsmakers, accreditoren en belanghebbenden op grote schaal een beter inzicht in het accreditatiesysteem. Ook levert het bewijs van verbeteringen die kunnen bijdragen aan het verbeteren van de duurzaamheid en toekomstige relevantie van accreditatie. De implicaties van dit proefschrift zijn naar verwachting relevant voor een bredere schaal vanwege de overeenkomsten tussen accreditatieprogramma's en de factoren die daarop van invloed zijn.

IMPACT STATEMENT

Accreditation is widely used as an external performance assessment tool to evaluate the compliance of healthcare organizations against defined standards, with the ultimate goal of improving healthcare quality. This dissertation provides a thorough view of the impact of accreditation, drivers and challenges that affect the normalization of accreditation standards in daily work, and improvements to consider in advancing the current accreditation model. A better understanding of the accreditation system would assist policymakers, accreditors, and stakeholders in identifying areas for improvement in hospital accreditation and making informed decisions about the accreditation pathway. Also, the findings would serve as a road map for introducing changes to enhance the modernization and sustainability of accreditation. This dissertation focuses on the hospital accreditation program in Saudi Arabia. However, the lessons learned and their implications are relevant to hospital accreditation in broader contexts, as well as other accreditation programs.

Contribution relevant to frontline staff and hospital managers

As evidenced in this dissertation, engaging frontline workers in accreditation improves the integration of accreditation standards, while detaching them from the process raises the likelihood of change resistance. Indeed, the technical nature and the specificity of some accreditation standards necessitate involving frontline workers who provide the service since they are in a better position to understand and implement these standards. Therefore, hospital leaders need to adopt several strategies to enhance the participation of frontline workers, such as involving frontline workers in the planning phase, incentive programs, quality-related training, and presenting standards alongside convincing evidence.

Furthermore, this dissertation underlines the detrimental influence of accreditation on the stress level of hospital frontline workers. Saudi hospital directors perceive such stress as a key challenge influencing the participation of frontline workers in the accreditation journey. This challenge may result in certain mismatches between the real practices and accreditation standards. Hence, hospital leaders and accreditors need to take action in order to reduce the associated stress. These actions may include leadership support, conducting accreditation awareness campaigns, and better design of accreditation standards. Also, the findings encourage hospitals to adopt a continuous accreditation readiness approach to gradually incorporate accreditation standards in business operations instead of gearing up a few days or

weeks prior to the survey. This strategy helps in anchoring standards into everyday activities in a constant manner and prevents the crisis and stress that the survey may cause, as indicated in this dissertation.

The effectiveness of integrating accreditation standards depends initially on making sense of accreditation and understanding the mechanisms through which the standards are routinized into business operations. This understanding contributes to reducing cultural resistance, encouraging the participation of frontline workers in accreditation, and enhancing in-hospital teamwork during standards integration. Hence, hospital leaders need to get acquainted with accreditation standards and translate this understanding into a bundle of activities to identify performance gaps, align hospital practices with the standards, and maintain positive change. In fact, leadership commitment, involving the relevant teams, and employing a teamwork approach influence the accomplishment of these actions, as evidenced in this dissertation. Following the integration of standards, conducting an objective evaluation by hospital leaders helps to learn from successes, detect residual performance gaps, and maintain performance gains.

Contribution relevant to accreditors

This dissertation evidences multiple factors that are directly linked to the accreditation design and affect the accreditation journey in Saudi hospitals, positively and negatively. On the one hand, the clarity of accreditation standards, the evidenced-based nature of standards, and the alignment of accreditation requirements with the hospital strategy are perceived as enablers that support integrating accreditation standards. On the contrary, the cost of the accreditation visit, standard irrelevancy, and lack of inter-surveyor reliability are perceived as the main challenges. Hence, accrediting bodies need to address factors affecting standards integration by strengthening enablers and weakening restrainers in order to increase the likelihood of institutionalizing accreditation standards at the hospital level.

Sustaining hospital accreditation programs requires reframing the current model while addressing the influencing challenges. This dissertation provides evidence of key improvements that are important for accrediting bodies to consider when redesigning hospital accreditation, including changes in the accreditation policy, standards development, survey evaluation, and the survey team. For instance, accrediting bodies continue to disregard the results of patient satisfaction surveys in the accreditation decision matrix. Hence, accreditors need to integrate patient perspectives in all aspects of accreditation, including decisions, as evidenced in

this dissertation. Furthermore, the findings of this dissertation cast doubt on the validity of the snapshot evaluation approach employed during accreditation surveys. Therefore, this dissertation underscores the importance of substituting this approach with a monitoring system to ensure continuous compliance with accreditation standards. Also, the dissertation emphasizes the importance of shifting the focus of accreditation standards to outcomes and improvements, instead of structure and process. Lastly, accreditors need to exhort efforts in using rigorous selection criteria for recruiting surveyors, training surveyors on accreditation standards effectively, and reducing the variations among survey teams.

Despite the fact that the dissertation focuses on the case of Saudi Arabia, the lessons learned on accreditation challenges and sustainability are relevant to hospital accreditation in broader contexts. Hence, as presented in this dissertation, accrediting bodies on a national and international scale need to establish several innovative improvements in hospital accreditation schemes to preserve the position of accreditation as a quality improvement tool while also enhancing its sustainability and future relevance.

Contribution relevant to policymakers

This dissertation shows that adhering to accreditation standards offers several advantages in terms of improving the quality of healthcare services at macro- and micro-levels. In healthcare, policymakers establish the regulations that govern the health system through various health policies to achieve specific healthcare goals and ensure that people are safe and healthy. Indeed, this role is congruent with the ultimate goal of accreditation. As evidenced in this dissertation, integrating accreditation standards offers several benefits at the hospital and societal levels. Using the case of Saudi Arabia, this dissertation provides policymakers with a better understanding of the accreditation working mechanism and the influencing factors. Accreditation is viewed as a performance improvement tool that complements other national quality improvement strategies. Therefore, the effectiveness of accreditation expands upon harmonizing the accreditation standards with other health policies, as discussed in this dissertation. Hence, policymakers need to incentivize and modernize accreditation policy to support national health strategic priorities in promoting the quality of healthcare.

As evidenced in the dissertation, a variety of policy-related driving and restraining factors influence the integration of accreditation standards. In Saudi Arabia, linking

accreditation to the reimbursement system, synchronizing accreditation standards with the requirements of authoritative entities, and the national health reform and privatization are perceived as enablers. On the other hand, the bureaucratic decision-making procedures, lack of governance expertise in quality, and limited financial support are the main perceived challenges, as shown in this dissertation. These findings assist policymakers in assessing accreditation readiness at the national level, prioritizing efforts and resources, and making informed decisions on how to strengthen policy-related drivers and weaken restrainers. Hence, policymakers need to exhort strategic efforts to strengthen the alignment of accreditation standards with the national regulations, national health strategic priorities, and the requirements of other health policies in order to increase the likelihood of institutionalizing accreditation standards. Further, policymakers need to allocate adequate and suitable resources to assist healthcare facilities in meeting accreditation standards.

Contribution to society

The societal impact of this dissertation rests on providing patients and families with a broad view and knowledge of the accreditation system. In this, patients would realize that accreditation is a comprehensive process rather than just a certificate obtained and hung on a wall. In addition, the dissertation provides patients and families with an overview of the impact of integrating accreditation standards in hospital operations and how this integration results in improved quality of care and health outcomes.

Indeed, the role of patients in hospital accreditation goes beyond simply being a recipient of care. According to this dissertation, patients are at the center of accreditation processes. For instance, staff commitment to patient-centered approach and public confidence in accreditation as a quality marker facilitate staff engagement in accreditation. Furthermore, involving patient perspectives in all accreditation aspects is perceived as one of the most important changes to be considered when enhancing the current accreditation model, as shown in this dissertation. This may increase the validity of the process, make it more customer-driven, and increase the confidence of patients in accredited hospitals.

Contribution to research

This dissertation is based on qualitative and quantitative evidence designed following a comprehensive systematic review of the impact of hospital accreditation.

The findings show a positive impact of hospital accreditation on the quality of healthcare. Yet, various factors affect the process of integrating accreditation standards in business operations. This dissertation shows that the advantages of accreditation are undeniable. However, given the complexity, time, and expenditures required to meet accreditation standards, further rigorous studies to investigate the impact of accreditation, particularly on economic outcomes will be beneficial. Also, conducting longitudinal research to detect changes and improvements over time may help in determining accreditation effects.

From another angle, the dissertation emphasizes that numerous internal and external factors influence the attitude of stakeholders toward implementing accreditation standards. In this, staff engagement in accreditation affects the integration process positively. Hence, this dissertation encourages conducting further research to evaluate the strategies that consolidate the engagement of stakeholders and explore the resource requirements to overcome possible obstacles. Furthermore, the dissertation recommends exploring the attitude of various stakeholders toward accreditation to help determine the future shape of accreditation models.

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CURRICULUM VITAE

Mohammed Hussein was born on 21 September 1984 in Jordan. Following high school, he pursued his bachelor's degree in nursing science at the University of Jordan and graduated in 2005. Upon graduation, he started his clinical carrier in critical care settings for 6 years. Simultaneously, he earned his master's degree in clinical nursing/critical care at the University of Jordan and graduated in 2008. In 2011, he shifted his career focus to healthcare quality management. In this, he was involved in areas such as performance improvement, patient safety, risk management, and healthcare accreditation.

Currently, Mohammed is a consultant in healthcare management and policies, with around 18 years of experience in managing accredited healthcare facilities. To strengthen the theoretical background of his quality work, he earned many quality credentials, including certified professional in healthcare quality (CPHQ) in 2012, certified professional in patient safety (CPPS) in 2014, certified professional in healthcare risk management (CPHRM) in 2015, certified key performance indicator professional (CKPIP) in 2016, certified six sigma green belt (CSSGB) in 2016, and certified accreditation surveyor in 2014.

As a training consultant, Mohammed has conducted over 250 training programs for over 12,000 healthcare professionals in the field of management, quality, patient safety, and risk management. His passion is to strengthen the role of leadership and policymakers to further enhance the quality culture in the healthcare industry. His research interests include value-based health care, system design and improvement, health policy and outcome, risk management, and healthcare management. Mohammed started his Ph.D. program at Maastricht University in 2020. During his Ph.D. trajectory, he published several research papers on healthcare accreditation in international journals.

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