

The Benefits of Accreditation for Healthcare Quality

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ABSTRACT

Background: Accreditation is widely regarded as a reliable method for assessing and improving the quality of medical care provided. However, the effect that it has on performance and outcomes is not yet fully understood. The purpose of this review was to locate and assess the available evidence regarding the effects of hospital accreditation.

Methods: We conducted in-depth searches of a variety of electronic databases, including PubMed, CINAHL, PsycINFO, EMBASE, MEDLINE (OvidSP), CDSR, CENTRAL, ScienceDirect, SSCI, RSCI, and SciELO, as well as other sources, using subject headings that were pertinent to our inquiry. No matter how the studies were designed or written, we included all quantitative research that had been reviewed by experts and published in the past twenty years. In accordance with the guidelines provided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses, two reviewers independently screened the initially identified articles, read the full texts of potentially relevant studies, extracted the necessary data, and evaluated the methodological quality of the studies that were included in the analysis using a validated tool. The results of the accreditation effects were analyzed, and six distinct impact themes were identified and categorized as a result.

Results: After reviewing a total of 17,830 studies, we decided to include only 76 of the empirical studies that investigated the effects of accreditation because they satisfied our criteria. Different research approaches were taken in each of these studies. Our findings indicate that hospital accreditation has a consistent and positive effect on safety culture, process-related performance measures, efficiency, and the length of stay for patients. On the other hand, employee satisfaction, patient satisfaction and experience, and the 30-day hospital readmission rate were found to be unrelated to accreditation. Because of the contradictory findings regarding the impact of accreditation on the mortality rate and infections associated with healthcare, it was difficult to reach definitive conclusions regarding these outcome measures.

Conclusion: Compliance with accreditation standards is posited to have multiple plausible benefits, one of which is an improvement in a hospital's overall performance, and there is some evidence to support the notion that this proposition. The introduction of hospital accreditation schemes encourages performance improvement and patient safety, despite the lack of evidence supporting a definitive link between the two.

It is recommended that efforts be made to modernize accreditation and provide incentives for getting it in order to move toward institutionalization and maintain performance gains.

KEYWORDS: Accreditation, Hospitals, Quality of health care, Health services

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BACKGROUND

"To Err is Human," a seminal report published by the Institute of Medicine (IOM) in 1999 [1], advocated for increased quality and safety in healthcare [2]. According to the report, quality is multifaceted, and quality assessment is one of the driving forces behind

performance improvement [3, 4]. As a result, various approaches have been used around the world to regulate healthcare quality both internally and externally [5]. External review systems facilitate organizational change, improve service quality, and strive for quality standards [6]. Accreditation is the oldest and most widely used

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strategic external quality assessment tool in healthcare [7, 8].

It should be noted that the American College of Surgeons planted the embryonic seeds of hospital accreditation over a century ago [9]. Since then, hospital accreditation programs have spread widely and become an essential component of health-care quality assurance systems [10-12]. Many countries have adopted or adapted hospital accreditation systems over the last two decades [13].

Accreditation is an external peer review that assesses a healthcare organization's compliance with pre-defined performance standards [14], with the ultimate goal of improving healthcare quality [15]. It is overseen by a number of governmental and non-governmental organizations, who use various modalities in either voluntary or mandatory approaches. The accreditation scope can include the entire healthcare facility, a specialty, or even a sub-specialty [6, 16]. Several leading international healthcare organizations have recognized accreditation as a valid quality indicator [12] and discussed the efficacy of using accreditation standards as a tool to improve organizational and clinical performance [17-19]. Nonetheless, there is little evidence in the literature to support this assumption.

Despite the apparent promising effect of healthcare accreditation [20, 21], the literature provides a complex picture of its impact [22]. Concerns about accreditation's legitimacy stem from a scarcity of high-quality trials and conflicting reported results [23-25]. Inconsistency in the conclusions of previously published reviews [6, 12, 13, 23, 26-35] has resulted from contradictory findings. On the one hand, hospital accreditation has been shown to have a positive impact on organizational culture [12, 32, 34], clinical practice, organizational performance [23], clinical leadership, patient safety systems [28], quality of services [29], care delivery process [30], and efficiency [35]. Several reviews, on the other hand, found insufficient evidence regarding the impact of accreditation on measurable changes in quality of care [12], health outcomes [26], patient satisfaction [31], and economic outcomes [13, 26, 34]. Greenfield and Braithwaite [13], for example, present contradictory findings on the impact of accreditation, stating that the effect was limited to promoting change and professional development, while results on other impact categories such as quality measures, financial impact, and public disclosure were inconclusive. Furthermore, some reviews called accreditation's cost-effectiveness into question [6, 32, 33]. Previous accreditation reviews examined the impact of specialty [30] or disease-specific [34] accreditation programs, which could dilute the overall impact of hospital accreditation, used stringent inclusion designs that could limit its contribution room [6, 12], restricted search languages, or overlooked several important relevant studies [35]. This review overcame these obstacles and

sought to identify and analyze evidence on the impact of hospital accreditation.

METHODOLOGY

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [36], which are presented in Additional file 1, were used to conduct our review. We confirmed that there was no ongoing or completed systematic review similar to ours in the Prospero and Health Systems Evidence (HSE) databases at the start of the study

Databases and Search Terms

As shown in Additional file 2, electronic bibliographic databases were systematically searched to retrieve relevant publications using relevant subject headings and controlled vocabulary terms. PubMed, CINAHL, PsycINFO, EMBASE, MEDLINE (OvidSP), ScienceDirect, Cochrane Database of Systematic Reviews (CDSR), Cochrane Central Register of Controlled Trials (CENTRAL), and Web of Science, which includes the Social Sciences Citation Index (SSCI), Russian Science Citation Index (RSCI), SciELO Citation Index, and KCI-Korean Journal Database, are among the databases. The primary author conducted the search described here on 18-Feb-2020 after consulting with a specialist librarian.

In addition, we searched Google Scholar for key words such as accreditation, hospital, quality, impact, and healthcare services in various combinations. In addition, we searched the websites of the most popular accreditation bodies for additional papers that we might have missed.

Screening and Eligibility Determination

From January 2000 to February 2020, we included full-text publications that assessed the impact of overall hospital accreditation programs on the quality of healthcare services over the last two decades (i.e., since "To Err Is Human"). All quantitative studies, regardless of design, were included. There was no language restriction added. Following the search, titles and abstracts were retrieved and deduplicated before being uploaded into the bibliographic reference management software EndNote X9. Following that, two authors (MH, MG) independently screened all titles and abstracts for potentially relevant articles and read the full text of relevant studies to determine eligibility. The PICO criteria [38] were used to determine study eligibility: Population—all types of hospitals; intervention—all types of overall accreditation; comparison of unaccredited hospitals, before-and-after, or different accreditation levels; outcomes—measurable impacts on structure, process, or outcome parameters Any disagreement between the two authors was resolved by consensus or arbitration by a third author at any stage (MP).

Unpublished/unindexed studies, review articles, and studies published in "abstract" format were excluded.

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Excluded were studies conducted in healthcare settings other than hospitals, studies evaluating the impact of accreditation on a specialty or disease-specific, and studies examining the cost of accreditation preparation. Furthermore, studies that assessed the perceived benefits of accreditation were excluded. Comparative studies that examined accreditation effects on self-reported subjective outcome parameters (e.g., patient satisfaction, job stress) using a validated instrument were included to evaluate the impact from various perspectives.

To assess full-text assessment reliability, a kappa inter-rater reliability (IRR) test was performed [39, 40]. We randomly selected and matched a sample of 50 studies that the two reviewers considered for inclusion. Four differences were found, resulting in kappa 0.81, indicating a high level of agreement.

Data Extraction

Studies that met our inclusion criteria were independently interrogated by two authors using a standardized data extraction form, and their references were screened for additional potentially relevant studies (i.e., snowballing). For analysis, details on the research designs, goals, findings, and conclusions were extracted and compiled. When insufficient information hampered data extraction, the corresponding author was contacted. All relevant non-English-language studies were translated using Google Translate, which has been cited in systematic reviews as a reliable tool for translating papers published in languages other than English [41, 42]. We e-mailed the data extracted from the included non-English studies to the corresponding author for verification and stipulated obtaining confirmation for inclusion to ensure authenticity. Studies that did not meet our inclusion criteria were summarized, along with the reason for exclusion, and records were kept for audit trail purposes.

Quality Assessment

Hawker et al [43] framework was used to assess the methodological precision of included publications in this review because it provides an appropriate unified scale for heterogeneous study designs. The instrument consists of nine items (abstract and title, introduction and goals, method and data, sampling, data analysis, ethics and bias, findings, transferability, and implications and usefulness), each of which is scored on a four-point scale (1 = good, 2 = fair, 3 = poor, 4 = very poor). The average score of these items was used to determine the overall grade (1.00- 1.49 = good, 1.50-2.49 = fair, 2.50-3.49 = poor, 3.50-4.00 = very poor) [44].

The coders (MH, MG) independently assessed the methodological quality of each included study, assigned an appropriate score, and calculated the overall grade accordingly. A kappa IRR test was used with 20 randomly selected assessed studies to test the assessment credibility. A crosswalk between decisions revealed two disparities,

yielding kappa 0.8, indicating a level of trustworthiness [39, 40].

Analysis

For text mining [45], extracted data were synthesized and narratively presented using thematic analysis [46]. The effects were classified into six impact themes that had previously been reported in part or entirely in reviews [6, 12, 13, 26, 29, 32] and models [47]. In this perspective, accreditation's impact was defined as a measurable and distinct effect that the accreditation process demonstrated, either positively or negatively. The impact was deemed positive if all or most of the results were significantly advantageous, negative if all or most of the results were unfavorable, or neutral if no significant change was identified as a result of accreditation [26]. Changes in organizational culture and management; changes at the professional level; changes at the patient level; changes in patient clinical outcomes; changes in performance measures; and changes in economic outcomes were the impact themes. Each study was assigned to one or more outcome themes.

RESULTS

Search Results

Our search yielded 17,830 results. 327 articles were deemed potentially eligible and retrieved for full-text review based on title and abstract screening. 74 of these studies met our inclusion criteria. This included seven non-English studies that had been verified by their authors, while four other non-English studies were excluded because we had not received a response to our verification request. Two additional studies were discovered by screening the references of included articles, yielding a total of 76 studies for critical appraisal and analysis (see Fig. 1).

Features of the Included Studies

The key findings of all studies included in our review are summarized in Additional file 3. There has been a notable increase in the number and scope of studies evaluating the impact of accreditation in the literature over the last decade. Almost three-quarters of the included studies ($n = 52$) were published within the last five years (2015–2019). The majority of studies ($n = 69$) were conducted in English. The seven non-English studies that were verified and analyzed were published in Persian, Danish, Korean, and Hungarian.

Studies were carried out in 22 countries representing all inhabited continents. The United States ($n = 11$) and Brazil ($n = 9$) had the most studies. Two multinational studies were conducted in European hospitals [19, 28]. The impact of 23 accreditation programs was studied. The Joint Commission International Accreditation (JCIA) scheme received the most attention ($n = 14$). Twenty-one studies (28%) examined the impact of accreditation on a single

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hospital, with a total of 4400 hospitals studied.

Assessment of the Methods Used

Many of the studies in our review (n = 29) have a cross-sectional design. In 30 studies, a before-and-after design was used. In 12 and 14 studies, respectively, cohort and quasi-experimental designs were used. It is worth noting that only one randomized controlled trial (RCT) was discovered and included [48]. This level of evidence suggests a link between accreditation and performance measures; however, causal inferences should be made with extreme caution. With these observational designs and the the conclusion. This seemed unlikely to alter the review findings.

lack of methodological consistency, a meta-analysis was not possible.

The evaluation of the included studies revealed that 32, 37, and 7 studies, respectively,

had good, fair, and poor methodological quality. Studies with poor methodological

quality found a positive [49-51] (n = 3) or neutral [52-55] (n = 4) accreditation effect;

however, their findings should be interpreted with caution. To avoid jeopardizing our

narrative analysis, we ignored these studies.

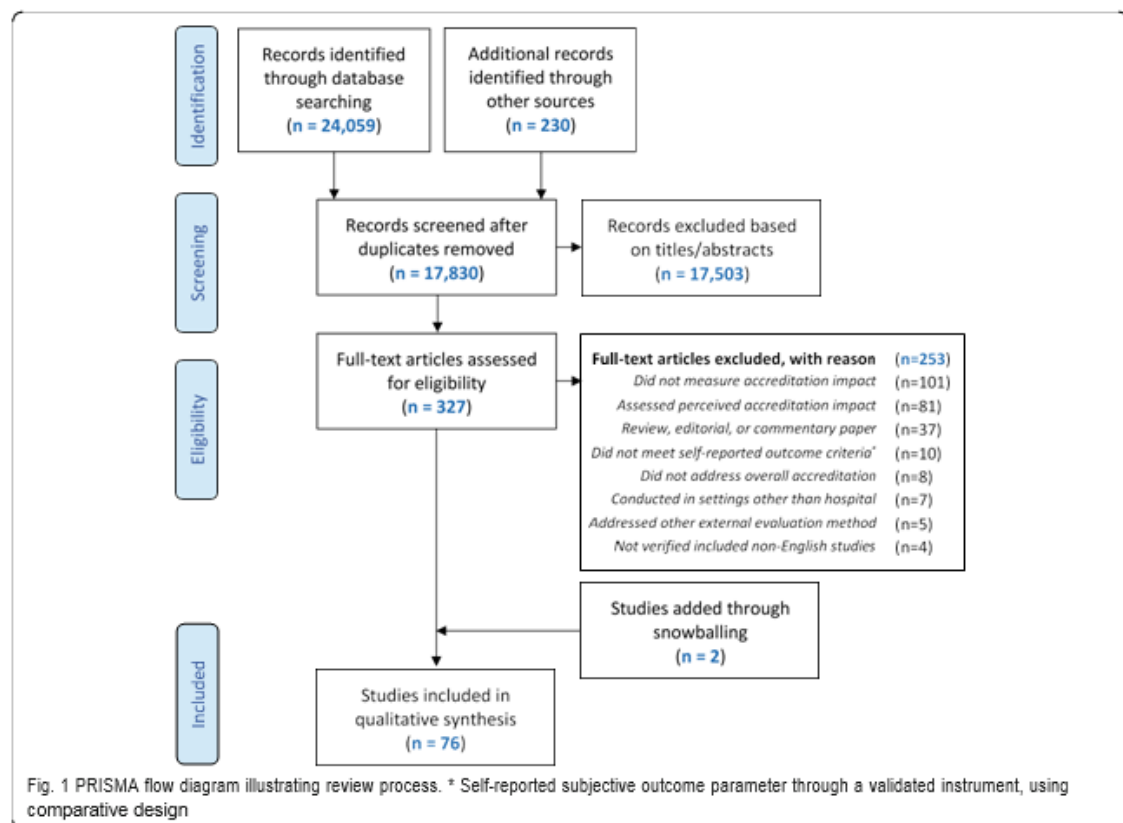


Fig. 1 PRISMA flow diagram illustrating review process. * Self-reported subjective outcome parameter through a validated instrument, using comparative design

The Impact Themes

The papers included were thematically grouped into six impact themes. More than 60% of the included publications were organized around two themes: "changes in patient clinical outcomes" and "changes in performance measures." Although our themes are exhaustive, they are not mutually exclusive, as 16% (n = 12) of the studies investigated the impact of accreditation on at least two separate measures.

Changes in Organizational Culture and Management

Five studies [56-60] quantified the impact of hospital accreditation on organizational culture and management. Several studies have used self-reported surveys to investigate the impact of hospital accreditation on safety culture. Most [56-58] but not all [59] discovered a strong link between the two. Accreditation improves perceived patient safety culture [56], safety culture toward

medication error reporting [57], and organizational culture as manifested by a less hierarchical culture and more group and developmental culture [58]. A recent study, on the other hand, found no changes in the safety management culture from the nurses' perspective after accreditation [59].

Changes at the Professionals' Level

Our review identified ten studies that assessed the impact of accreditation on self-reported parameters such as job stress, job satisfaction, and work environment [49, 59, 61-68], five of which were before-and-after studies, while the remaining used a comparative approach between accredited and non-accredited hospitals. The authors discovered that accreditation had a negative (n = 4) or no impact (n = 4) at the professional level, particularly for nurses who were the subjects of seven studies.

According to studies, hospital accreditation has a

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consistently negative impact on professionals' perceived job stress. For example, in four studies [59, 61-63], accreditation was associated with higher job stress as perceived by health professionals. In addition to stress, Elkins et al. [63] found that nurses experienced increased anxiety and depression during the accreditation preparation phase, as well as a significant improvement in job satisfaction and sleep function after accreditation. However, due to the scarcity of research, it is unclear whether accreditation affects job satisfaction or the working environment.

Changes at the Patient Level

There were only 14 studies that looked at the impact of hospital accreditation on measurable patient-reported

outcome parameters [21, 48, 53, 55, 69-78]. The majority of the studies (n = 12) used an observational cross-sectional design.

Despite the widely held belief that accreditation contributes to improved patient satisfaction and experience, most findings provide little evidence to support whether accreditation status or ratings are meaningfully linked to patient satisfaction and experience. Multiple studies comparing accredited to non-accredited hospitals [21, 48, 70, 71, 77, 78] or accredited hospitals at various accreditation levels [69, 72] found no association. For example, Sack et al [77, 78] found no link between accreditation and patients' perceptions of higher quality, as reflected in their hospital or cardiology unit recommendation rates.

Table 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)	56-60	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)	49, 59, 61-68	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)	21, 48, 53, 55, 69-78	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)	8, 21, 25, 50-53, 79-95	8	12	4	15	0	5
Changes in the performance measures (n = 28)	Demonstrated as a statistically significant change in clinical performance measures (e.g., hand hygiene compliance, medication utilization)	8, 19, 28, 48, 51, 54, 60, 68, 79, 87, 90, 96-111	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)	83, 90, 112-117	4	4	0	5	1	2

Changes in Patient Clinical Outcomes

Surprisingly, approximately one-third (n = 24) of the included studies investigated the impact of hospital accreditation on patient outcomes [8, 21, 25, 50-53, 79-95]. 75% of these have been published since 2015, as an obvious response to previous requests to investigate the effects of accreditation on clinical outcomes. Overall, the findings revealed a clear trend of a positive relationship between accreditation and clinical outcome. Studies reported having (n = 15) or not having (n = 5) positive effects on clinical outcomes, with none concluding that there was an overall negative impact. The most studied variables were the in-hospital mortality rate (n = 13) and the patient's length of stay (n = 12).

Comparative studies found that accreditation had a positive effect on mortality rates at various stages of accreditation [79-84]. These studies, however, were limited to two accreditation schemes, The Joint

Commission on Accreditation of Healthcare Organizations (JCAHO) in the United States and the Danish Healthcare Quality Program (DDKM in Danish: den danske kvalitets model) in Denmark, which may limit generalization. Patients treated in high compliance hospitals, for example, had significantly lower mortality compared to hospitals with low [82, 83] or persistently low [84] accreditation standards compliance. In contrast, no such relationship was found in other studies [8, 21, 85-88].

Several studies [21, 84, 89, 90] consistently found no relationship between accreditation and hospital 30-day readmission rate, whereas other studies found contradictory effects on healthcare-associated infections [25, 85, 91, 92]. However, studies have consistently found that accreditation has a positive impact on hospital [84, 86, 89, 93] and departmental [91, 94, 95] patient length of stay.

Changes in the Performance Measures

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There is evidence to suggest that hospital accreditation improves service quality. As a result, improvements in structure and process performance metrics are possible [21, 83]. The impact of accreditation on performance measures was the most studied topic in our review ($n = 28$) [8, 18, 19, 28, 48, 51, 54, 60, 68, 79, 87, 90, 96-111]. Despite the complexity and cyclicity of accreditation effects on performance measures, approximately three-fourths ($n = 18$) of the analyzed studies found that accreditation had a positive effect on service quality at the organizational and departmental levels.

Despite the fact that the only included RCT found no or a weak association between accreditation and quality indicators [48], the methodological quality of this study was adequate but not sufficient to generalize this finding. Several quasi-experimental and prospective longitudinal studies [8, 60, 96-99] found that accreditation had a significant positive effect on various aspects of service quality. Long-term participation in accreditation was associated with higher standards compliance [60], adherence to recommended guidelines [97], improvement in structural and process elements [19, 28], and sustained change [98]. Accreditation, for example, resulted in significant improvement of various processes that did not meet the target performance during the 6-month period preceding the accreditation survey in a stepped-wedge multi-level study [99]. Accreditation participation has demonstrated tangible benefits in performance measures related to acute myocardial infarction [79, 100], heart failure, and pneumonia [100]. Nonetheless, some research has found that accreditation has no effect on hand hygiene compliance [101], medication administration error rates [102], or other performance measures [87, 103, 104].

Changes in Economic Outcomes

There are eight studies evaluating the economic effects of accreditation [83, 90, 112-117]. The majority of them ($n = 5$) had a positive impact on a variety of economic outcomes, most notably healthcare efficiency.

Aside from estimating the cost of accreditation, which varies greatly between countries and programs, accreditation has been shown to have a significant positive effect on cost reduction [90], increase in outpatient revenue share [83], higher productivity [112], and improved efficiency [113-115]. For example, a large retrospective longitudinal study that followed 748 hospitals for ten years found that hospital accreditation had a significant positive net impact on improving mean efficiency as estimated by bootstrapped data envelopment analysis (DEA) during the accreditation year and the two years following [113]. Another observational study discovered that hospital accreditation was associated with 119% improvement on a quality index relative to baseline data, resulting in a combined savings of US\$ 593,000 in two hospitals over three years [90]. Participation in accreditation programs, on the other hand, was found to

have an inverse effect on hospital efficiency due to increased staffing demand and equipment investment [116]. Other research has found no significant impact of accreditation on operating room efficiency [117], cash-flow margin, or total cost per case [83].

DISCUSSION

This review thoroughly examined the hospital accreditation literature over the last two decades in order to comprehend its impact on the quality of health care. In total, 76 studies were included and assigned to one of the impact categories.

Despite the mixed feelings, more than 55% of the included studies found a positive accreditation effect. Our findings show that accreditation has a consistent positive effect on process-related performance measures, safety culture, hospital efficiency, and patient length of stay. Staff job stress, on the other hand, was consistently found to be negatively affected. Heterogeneous mortality and healthcare-associated infection outcomes made it difficult to draw firm conclusions. Accreditation was found to be unrelated to staff job satisfaction, patient satisfaction and experience, and 30-day readmission rate. However, differences in accreditation schemes [19], the inability to isolate extrinsic confounders, and the diversity of hospital characteristics may all have an impact on these findings.

Despite the fact that culture is frequently cited as a cause of failure, our review discovered a positive effect of accreditation on organizational safety culture. Individually, however, accreditation has a negative impact on professionals' stress levels [59, 61-63]. This could point to the need for a balance between accreditation risks and benefits in order to encourage health practitioners' acceptance and participation in the accreditation journey [30, 118]. Such a negative outcome appears to be unavoidable. However, awareness campaigns, leadership support, and improved accreditation standards and processes are critical remedies to consider [119].

In line with previous reviews [13, 31, 32, 34], our analysis found no link between accreditation and improved patient satisfaction or experience. Our review did not support the earlier assumption that patient satisfaction is a reflection of hospital quality of service [120]. While our findings support the notion that accreditation is a tool that encourages the improvement of internal process delivery [121], the appropriate improvement threshold for being tangible is ambiguous. The answer is most likely determined by the design of the accreditation standards and processes [4, 122].

Our review discovered that hospital accreditation benefits appear before [56, 96], during [80], and after [97, 107]. Nonetheless, the cyclicity of the impact of accreditation and how long the effect lasts is a source of concern [16, 81, 99, 123]. According to studies, the positive impact of accreditation on economic outcomes is due to performance

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improvement [90]. However, the small number of studies made it difficult to draw firm conclusions. Isolating the financial impact of accreditation from other contextual factors is difficult, which may explain the scarcity of studies in this domain [13, 124].

More research on the impact of hospital accreditation is required to solve a piece of the jigsaw puzzle. One could argue that the accreditation literature's heterogeneity and observational nature limit its value in providing convincing conclusions on accreditation effectiveness [125]. However, the lack of firm evidence of the effects does not imply a lack of effect. Having recognized the ethical and practical challenges of conducting randomized trials on this complex process [11], observational studies appear to be of undeniable value, despite their limitations. The majority of the studies in our review used cross-sectional or two-point comparative designs (i.e., before-and-after). As a result, one could argue that the observed improvement in observational studies is not necessarily due to accreditation. However, this assumption does not justify abandoning what has already been discovered, and even if observed improvements were secondary to other accreditation-driven factors, it is still a win-win situation. Our review has both strengths and weaknesses. This is one of the largest systematic reviews to investigate the impact of hospital accreditation. To elucidate the complex view for researchers, policymakers, and stakeholders in the accreditation field, the study extensively discussed the measures and aspects being addressed and affected by introducing hospital accreditation. The use of pre-determined inclusion criteria, citation indices, and a diverse set of databases increased the likelihood of identifying all relevant publications. We recognize that it is still possible to overlook some studies that have not been published in peer-reviewed journals. However, our extensive search indicates that bias in the results is unlikely. We must admit that not searching the grey literature was a limitation of our review. The grey literature can make an important contribution to the review and may help to reduce publication bias [126]. To ensure the validity of the results, we restricted our search to studies that had been rigorously peer-reviewed or were indexed in academic journals [127]. Despite the fact that our review included evidence on the effectiveness of accreditation in both developing and developed countries, no distinction was made between these settings.

CONCLUSION

Accreditation must be viewed as a supplement to other performance improvement strategies in order to have a tangible impact on the health system. The viewpoint must be consistent with the fact that accreditation is a "knowledge translation" intervention that aids in the incorporation of standards into daily activities [128]. The benefits of accreditation outweigh the disadvantages.

However, we agree with previous reviews [6, 12, 23, 32, 33, 129] in calling for more rigorous research into the impact of accreditation, particularly on economic outcomes, to determine whether the benefits truly outweigh the costs. Using longitudinal designs and testing for exogenous confounders could aid in detecting causal conclusions of accreditation effects and enriching consequential decisions in this domain.

Our findings support the notion that adhering to accreditation standards has numerous plausible benefits in terms of improving hospital performance and outcomes. Despite inconclusive evidence on causality and minor unintended negative consequences of hospital accreditation, such as job stress, we conclude that implementing hospital accreditation promotes performance improvement and patient safety. To move towards institutionalization and sustaining performance gains, efforts to incentivize and modernize accreditation are recommended in tandem with other health policies.

REFERENCES

- I. Institute of Medicine Committee on Quality of Health Care in America. In: Kohn LT, Corrigan JM, Donaldson MS, editors. *To Err is Human: Building a Safer Health System*. Washington (DC): National Academies Press (US); 2000. <https://doi.org/10.17226/9728>.
- II. Altman DE, Clancy C, Blendon RJ. Improving patient safety-five years after the IOM report. *N Engl J Med*. 2004;351(20):2041-3. <https://doi.org/10.1056/NEJMp048243>.
- III. Devers KJ, Pham HH, Liu G. What is driving hospitals' patient-safety efforts? A study of twelve communities suggests that a regulatory body, not market forces, is having the strongest impact on hospitals' efforts to improve patient safety. *Health Aff (Millwood)*. 2004;23(2):103-15. <https://doi.org/10.1377/hlthaff.23.2.103>.
- IV. Moffett M, Bohara A. Hospital quality oversight by the joint commission on the accreditation of healthcare organizations. *East Econ J*. 2005; 31:629-47.
- V. Greenfield D, Hinchcliff R, Hogden A, Mumford V, Debono D, Pawsey M, et al. A hybrid health service accreditation program model incorporating mandated standards and continuous improvement: interview study of multiple stakeholders in Australian health care. *Int J Health Plann Manag*. 2016;31(3):e116-30. <https://doi.org/10.1002/hpm.2301>.
- VI. Flodgren G, Gonçalves-Bradley DC, Pomey MP. External inspection of compliance with standards for improved healthcare outcomes. *Cochrane Database Syst Rev*. 2016;12:CD008992. <https://doi.org/10.1002/14651858.CD008992.pub3>.
- VII. Viswanathan HN, Salmon JW. Accrediting organizations and quality improvement. *Am J Manag Care*. 2000;6(10):1117-30.
- VIII. Petrović GM, Vuković M, Vraneš AJ. The impact of accreditation on healthcare quality in hospitals. *Vojnosanit*

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- Pregled. 2018;75(8):803–8.
<https://doi.org/10.2298/VSP160728390M>.
- IX. Hornsby JA. Hospitals as they are: the hospital problem of today—what is it? *Bull Am Coll Surg*. 1917; 1:4–11.
- X. Shaw CD. External quality mechanisms for health care: summary of the ExPeRT project on visitatie, accreditation, EFQM and ISO assessment in European Union countries. External peer review techniques. European Foundation for quality management. International Organization for Standardization. *Int J Qual Health Care*. 2000;12(3):169–75. <https://doi.org/10.1093/intqhc/12.3.169>.
- XI. Braithwaite J, Westbrook J, Pawsey M, Greenfield D, Naylor J, Iedema R, et al. A prospective, multi-method, multi-disciplinary, multi-level, collaborative, social-organisational design for researching health sector accreditation [LP0560737]. *BMC Health Serv Res*. 2006;6(1):113. <https://doi.org/10.1186/1472-6963-6-113>.
- XII. Brubakk K, Vist GE, Bukholm G, Barach P, Tjomsland O. A systematic review of hospital accreditation: the challenges of measuring complex intervention effects. *BMC Health Serv Res*. 2015;15(1):280. <https://doi.org/10.1186/s12913-015-0933-x>.
- XIII. Greenfield D, Braithwaite J. Health sector accreditation research: a systematic review. *Int J Qual Health Care*. 2008;20(3):172–83. <https://doi.org/10.1093/intqhc/mzn005>.
- XIV. Shaw CD. Toolkit for accreditation programs. Australia: The International Society for Quality In Health Care; 2004.
- XV. Pomey MP, Francois P, Contandriopoulos AP, Tosh A, Bertrand D. Paradoxes of French accreditation. *Qual Saf Health Care*. 2005;14(1):51–5. <https://doi.org/10.1136/qshc.2004.011510>.
- XVI. Pomey MP, Lemieux-Charles L, Champagne F, Angus D, Shabah A, Contandriopoulos AP. Does accreditation stimulate change? A study of the impact of the accreditation process on Canadian healthcare organizations. *Implement Sci*. 2010;5(1):31. <https://doi.org/10.1186/1748-5908-5-31>.
- XVII. Rooney AL, van Ostenberg PR. Licensure accreditation and certification: approaches to health services quality. Washington, DC: Center for Human Services; 1999.
- XVIII. Braithwaite J, Greenfield D, Westbrook J, Pawsey M, Westbrook M, Gibberd R, et al. Health service accreditation as a predictor of clinical and organisational performance: a blinded, random, stratified study. *Qual Saf Health Care*. 2010;19(1):14–21. <https://doi.org/10.1136/qshc.2009.033928>.
- XIX. Shaw C, Groene O, Mora N, Sunol R. Accreditation and ISO certification: do they explain differences in quality management in European hospitals? *Int J Qual Health Care*. 2010;22(6):445–51. <https://doi.org/10.1093/intqhc/mzq054>.
- XX. Desveaux L, Mitchell JI, Shaw J, Ivers NM. Understanding the impact of accreditation on quality in healthcare: a grounded theory approach. *Int J Qual Health Care*. 2017;29(7):941–7. <https://doi.org/10.1093/intqhc/mzx136>.
- XXI. Lam MB, Figueroa JF, Feyman Y, Reimold KE, Orav JE, Jha AK. Association between patient outcomes and accreditation in US hospitals: observational study. *BMJ*. 2018; 20:363. <https://doi.org/10.1136/bmj.k4011>.
- XXII. Saleh SS, Bou Sleiman J, Dagher D, Sbeit H, Natafji N. Accreditation of hospitals in Lebanon: is it a worthy investment? *Int J Qual Health Care*. 2013;25(3):284–90. <https://doi.org/10.1093/intqhc/mzt018>.
- XXIII. Greenfield D, Pawsey M, Hinchcliff R, Moldovan M, Braithwaite J. The standard of healthcare accreditation standards: a review of empirical research underpinning their development and impact. *BMC Health Serv Res*. 2012;12(1):329. <https://doi.org/10.1186/1472-6963-12-329>.
- XXIV. Greenfield D, Braithwaite J. Developing the evidence base for accreditation of health care organisations: a call for transparency and innovation. *Qual Saf Health Care*. 2009;18(3):162–3. <https://doi.org/10.1136/qshc.2009.032359>.
- XXV. Salim FM, Rahman MH. The impact of joint commission international healthcare accreditation on infection control performance: a study in Dubai hospital. *Glob J Bus Soc Sci Rev*. 2017;5(1):37–45. [https://doi.org/10.35609/gjbsr.2017.5.1\(6\)](https://doi.org/10.35609/gjbsr.2017.5.1(6)).
- XXVI. de Santé HA. Literature review on the impact of hospital accreditation. Paris: MATRIX Knowledge group; 2010.
- XXVII. Flodgren G, Pomey MP, Taber SA, Eccles MP. Effectiveness of external inspection of compliance with standards in improving healthcare organisation behaviour, healthcare professional behaviour or patient outcomes. *Cochrane Database Syst Rev*. 2011;11:CD008992. <https://doi.org/10.1002/14651858.CD008992.pub2>.
- XXVIII. Shaw CD, Groene O, Botje D, Sunol R, Kutryba B, Klazinga N, et al. The effect of certification and accreditation on quality management in 4 clinical services in 73 European hospitals. *Int J Qual Health Care*. 2014;26(Suppl 1): 100–7. <https://doi.org/10.1093/intqhc/mzu023>.
- XXIX. Avia I, Hariyati RTS. Impact of hospital accreditation on quality of care: a literature review. *Enferm Clin*. 2019;29(Suppl 2):315–20. <https://doi.org/10.1016/j.enfcli.2019.06.003>.
- XXX. Alkhenizan A, Shaw C. Impact of accreditation on the quality of healthcare services: a systematic review of the literature. *Ann Saudi Med*. 2011;31(4): 407–16. <https://doi.org/10.4103/0256-4947.83204>.
- XXXI. Almasabi M, Yang H, Thomas S. A systematic review of the association between healthcare accreditation and patient satisfaction. *World Appl Sci J*. 2014;31(9):1618–23.
- XXXII. Hinchcliff R, Greenfield D, Moldovan M, Westbrook JI, Pawsey M, Mumford V, et al. Narrative synthesis of health service accreditation literature. *BMJ Qual Saf*. 2012;21(12):979–91. <https://doi.org/10.1136/bmjqs-2012-000852>.
- XXXIII. Kilsdonk M, Siesling S, Otter R, Harten W. Evaluating the impact of accreditation and external peer review. *Int J Health Care Qual Assur*. 2015;28(8):757–77. <https://doi.org/10.1108/IJHCOA-05-2014-0055>.
- XXXIV. Park IT, Jung YY, Park SH, Hwang JH, Suk SH. Impact of healthcare accreditation using a systematic review: balanced score card perspective [in Korean]. *Quality Improvement in*

The Benefits of Accreditation for Healthcare Quality

- Health Care. 2017;23(1):69–90.
<https://doi.org/10.14371/QIH.2017.23.1.69>.
- XXXV. Araujo CAS, Siqueira MM, Malik AM. Hospital accreditation impact on healthcare quality dimensions: a systematic review. *Int J Qual Health Care*. 2020;32(8):531–44. <https://doi.org/10.1093/intqhc/mzaa090>.
- XXXVI. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. 2009;6(7):e1000097. <https://doi.org/10.1371/journal.pmed.1000097>.
- XXXVII. Kerr NL. HARKing: hypothesizing after the results are known. *Personal Soc Psychol Rev*. 1998;2(3):196–217. https://doi.org/10.1207/s15327957pspr02_03_4.
- XXXVIII. Richardson WS, Wilson MC, Nishikawa J, Hayward RS. The well-built clinical question: a key to evidence-based decisions. *ACP J Club*. 1995;123(3): A12–3
<https://doi.org/10.7326/ACPJC-1995-123-3-A12>.
- XXXIX. Fleiss JL, Levin B, Paik MC. *Statistical methods for rates and proportions*. 3rd ed. Hoboken, NJ: John Wiley & Sons; 2003. https://doi.org/10.1002/047144_5428.
- XL. Belur J, Tompson L, Thornton A, Simon M. Interrater reliability in systematic review methodology: exploring variation in coder decision-making. *Sociol Methods Res*. 2018;50(2):837–65. <https://doi.org/10.1177/0049124118799372>.
- XLI. Groves M, Mundt K. Friend or foe? Google translate in language for academic purposes. *Engl Specif Purp*. 2015; 37:112–21. <https://doi.org/10.1016/j.esp.2014.09.001>.
- XLII. Jackson JL, Kuriyama A, Anton A, Choi A, Fournier JP, Geier AK, et al. The accuracy of google translate for abstracting data from non-English-language trials for systematic reviews. *Ann Intern Med*. 2019;171(9):677–9.
<https://doi.org/10.7326/M19-0891>.
- XLIII. Hawker S, Payne S, Kerr C, Hardey M, Powell J. Appraising the evidence: reviewing disparate data systematically. *Qual Health Res*. 2002;12(9):1284–99.
<https://doi.org/10.1177/1049732302238251>.
- XLIV. Groene O, Botje D, Suñol R, Lopez MA, Wagner C. A systematic review of instruments that assess the implementation of hospital quality management systems. *Int J Qual Health Care*. 2013;25(5):525–41. <https://doi.org/10.1093/intqhc/mzt058>.
- XLV. Salloum SA, Al-Emran M, Monem AA, Shaalan K. Using Text Mining Techniques for Extracting Information from Research Articles. In: Shaalan K, Hassanien A, Tolba F, editors. *Intelligent Natural Language Processing: Trends and Applications*. Studies in Computational Intelligence. Cham, Switzerland: Springer; 2018. p. 373–97.
- XLVI. Assarroudi A, Heshmati F, Armat MR, Ebadi A, Vaismoradi M. Directed qualitative content analysis: the description and elaboration of its underpinning methods and data analysis process. *J Res Nurs*. 2018;23(1):42–55.
<https://doi.org/10.1177/1744987117741667>.
- XLVII. Program BPE. 2019–2020 Baldrige excellence framework (health care): proven leadership and management practices for high performance. Gaithersburg, MD: U.S. Department of Commerce, National Institute of Standards and Technology; 2019. <https://www.nist.gov/baldrige>
- XLVIII. Salmon J, Heavens J, Lombard C, Tavrow P. *The Impact of Accreditation on the Quality of Hospital Care: KwaZulu-Natal Province, Republic of South Africa*. Operations Research Results 2:17. Bethesda MD: Published for the USAgency for International Development (USAID) by the Quality Assurance Project, University Research Co., LLC; 2003.
- XLIX. Domingues AL, dos Santos SVM, Góes FSN, Martinez MR. Evaluation of the contribution of hospital accreditation in the process of permanent health education. *J Nurs UFPE Line*. 2017;11(suppl 5):2177–84.
- L. Mørk Hansen G, Jensen CS, Østergaard LM, Dethlefsen C, Luther P, Andreassen JJ. Possible decrease in the prevalence of nosocomial infections after the accreditation process in the region of northern Jutland, Denmark [in Danish]. *Ugeskr Laeger*. 2013;175(8):495–8.
- LI. Al Awa B, De Wever A, Almazrooa A, Habib H. al-Noury K, el Deek B, et al. the impact of accreditation on patient safety and quality of care indicators at king Abdulaziz University hospital in Saudi Arabia. *Res J Med Sci*. 2011; 5(1):43–51. <https://doi.org/10.3923/rjmsci.2011.43.51>.
- LII. Almasabi M, Thomas S. The impact of Saudi hospital accreditation on quality of care: a mixed methods study. *Int J Health Plann Manag*. 2017;32(4):e261–e78.
<https://doi.org/10.1002/hpm.2373>.
- LIII. Marzban S, Ramezankhani A, Rezai-Rad M, Daneshkohan A, Najafi A. Status of accessible quality indices in the hospitals of Shahid Beheshti University of Medical Sciences according to accreditation in 2015. *Ann Trop Med Public Health*. 2017;10(4):956–62.
https://doi.org/10.4103/ATMPH.ATMPH_265_17.
- LIV. Abedi G, Abedini E, Malakzadeh R, Mojarad F. Medical errors management before and after implementation of accreditation in hospital. *Iran J Health Sci*. 2014;2(4):59–66. <https://doi.org/10.18869/acadpub.jhs.2.4.59>.
- LV. Joseph S. The effect of accreditation on patient satisfaction in public healthcare delivery: a comparative study of accredited and non-accredited hospitals in Kerala. *Rajagiri J Soc Dev*. 2018;10(2):123–36.
- LVI. Lám J, Merész G, Bakacsi G, Belicza E, Surjan C, Takacs E. Changing of the patient safety culture in the pilot institutes of the Hungarian accreditation program [in Hungarian]. *Orv Hetil*. 2016;157(42):1667–73.
<https://doi.org/10.1556/650.2016.30556>.
- LVII. Lee E. Safety climate and attitude toward medication error reporting after hospital accreditation in South Korea. *Int J Qual Health Care*. 2016;28(4):508–14.
<https://doi.org/10.1093/intqhc/mzw058>.
- LVIII. Andres EB, Song W, Schooling CM, Johnston JM. The influence of hospital accreditation: a longitudinal assessment of organisational culture. *BMC Health Serv Res*. 2019;19(1):467. <https://doi.org/10.1186/s12913-019-4279-7>.
- LIX. Kim MR, Kim MS. Awareness, job stress, turnover intention, safety management perception change of nurses in a general

The Benefits of Accreditation for Healthcare Quality

- hospital - before and after medical institution certification system [in Korean]. *J Korea Contents Assoc.* 2019;19(1):385–95.
- LX. Greenfield D, Lawrence SA, Kellner A, Townsend K, Wilkinson A. Health service accreditation stimulating change in clinical care and human resource management processes: a study of 311 Australian hospitals. *Health Policy.* 2019;123(7):661–5. <https://doi.org/10.1016/j.healthpol.2019.04.006>.
- LXI. Al-Faouri I, Al-Dmour A, Al-Ali N, Abu ALRub R, Abu Moghli F. Effect of health care accreditation council survey site visit on perceived stress level among Jordanian healthcare providers. *Nurs Forum.* 2019;54(1):30–7. <https://doi.org/10.1111/nuf.12294>.
- LXII. Higashi P, Simonetti JP, Carvalhaes MABL, Spiri WC, Parada CMGL. Potentially stressful situations for nurses considering the condition of accreditation of hospitals. *Rev Rene.* 2013;14(6):1141–8.
- LXIII. Elkins G, Cook T, Dove J, Markova D, Marcus JD, Meyer T, et al. Perceived stress among nursing and administration staff related to accreditation. *Clin Nurs Res.* 2010;19(4):376–86. <https://doi.org/10.1177/1054773810373078>.
- LXIV. Kagan I, Farkash-Fink N, Fish M. Effect of joint commission international accreditation on the nursing work environment in a tertiary medical center. *J Nurs Care Qual.* 2016;31(4):E1–8. <https://doi.org/10.1097/NCQ.000000000000180>.
- LXV. Oliveira JLC, Souza VS, Pereira ACS, Haddad MCFL, Marcon SS, Matsuda LM. Work environment and accreditation: analysis by mixed explanatory sequential method. *Escola Anna Nery.* 2018;22(4):e20170379. <https://doi.org/10.1590/2177-9465-ean-2017-0379>.
- LXVI. Oliveira PB, Spiri WC, Dell'Acqua MC, Mondini CC. Comparison between the accredited and nonaccredited public hospital working environments. *Acta Paul Enferm.* 2016;29(1):53–9. <https://doi.org/10.1590/1982-0194201600008>.
- LXVII. Oliveira JLC, Magalhães AMM, Bernardes A, Haddad MCFL, Wolff LDG, Marcon SS, et al. Influence of hospital accreditation on professional satisfaction of the nursing team: mixed method study. *Rev Lat Am Enferm.* 2019;27:e3109. <https://doi.org/10.1590/1518-8345.2799.3109>.
- LXVIII. Um MH, Lyu ES, Lee SM, Park YK. International hospital accreditation and clinical nutrition service in acute care hospitals in South Korea: results of a nationwide cross-sectional survey. *Asia Pac J Clin Nutr.* 2018;27(1):158–66. <https://doi.org/10.6133/apjcn.032017.25>.
- LXIX. Heuer AJ. Hospital accreditation and patient satisfaction: testing the relationship. *J Healthc Qual.* 2004;26(1):46–51. <https://doi.org/10.1111/j.1945-1474.2004.tb00471.x>.
- LXX. Hayati NI, Azimatun NA, Rozita H, Ezat WA, Rizal AM. Inpatients' satisfaction in the medical and surgical wards - a comparison between accredited and non-accredited hospital in the state of Selangor. *J Commun Health.* 2010; 16(1):60–8.
- LXXI. Barghouthi ED, Imam A. Patient satisfaction: comparative study between Joint Commission International accredited and non-accredited Palestinian hospitals. *Health Sci J.* 2018; 12:547
- LXXII. Haj-Ali W, Bou Karroum L, Natafqi N, Kassak K. Exploring the relationship between accreditation and patient satisfaction - the case of selected Lebanese hospitals. *Int J Health Policy Manag.* 2014;3(6):341–6. <https://doi.org/10.15171/ijhpm.2014.116>.
- LXXIII. Al-Qahtani MF, Al-Dohailan SK, Al-Sharani HT, Al-Medaires MA, Khuridah EN, Al-Dossary NM. The impact of the status of hospital accreditation on patient satisfaction with the obstetrics and gynecology clinics in the Eastern Province. *J Med Med Sci.* 2012;3(10):665–73.
- LXXIV. Ajarmah BS, Hashem TN. Patient satisfaction evaluation on hospitals; comparison study between accredited and non-accredited hospitals in Jordan. *Eur Sci J.* 2015;11(32):298–314.
- LXXV. Mohebbifar R, Rafiei S, Asl AM, Ranjbar M, Khodayvandi M. Association between hospital accreditation and patient satisfaction: a survey in the Western Province of Iran. *Bangladesh J Med Sci.* 2017;16(1):77–84. <https://doi.org/10.3329/bjms.v16i1.31137>.
- LXXVI. Andres EB, Song W, Song W, Johnston JM. Can hospital accreditation enhance patient experience? Longitudinal evidence from a Hong Kong hospital patient experience survey. *BMC Health Serv Res.* 2019;19(1):623. <https://doi.org/10.1186/s12913-019-4452-z>.
- LXXVII. Sack C, Lütkes P, Günther W, Erbel R, Jöckel KH, Holtmann GJ. Challenging the holy grail of hospital accreditation: a cross sectional study of inpatient satisfaction in the field of cardiology. *BMC Health Serv Res.* 2010;10(1):120. <https://doi.org/10.1186/1472-6963-10-120>.
- LXXVIII. Sack C, Scherag A, Lütkes P, Günther W, Jöckel KH, Holtmann G. Is there an association between hospital accreditation and patient satisfaction with hospital care? A survey of 37 000 patients treated by 73 hospitals. *Int J Qual Health Care.* 2011;23(3):278–83. <https://doi.org/10.1093/intqhc/mzr011>.
- LXXIX. Chen J, Rathore SS, Radford MJ, Krumholz HM. JCAHO accreditation and quality of care for acute myocardial infarction. *Health Aff (Millwood).* 2003; 22(2):243–54. <https://doi.org/10.1377/hlthaff.22.2.243>.
- LXXX. Barnett ML, Olenski AR, Jena AB. Patient mortality during unannounced accreditation surveys at US hospitals. *JAMA Intern Med.* 2017;177(5):693–700. <https://doi.org/10.1001/jamainternmed.2016.9685>.
- LXXXI. Towers TJ, Clark J. Pressure and performance: buffering capacity and the cyclical impact of accreditation inspections on risk-adjusted mortality. *J Healthc Manag.* 2014;59(5):323–35. <https://doi.org/10.1097/00115514-201409000-00005>.
- LXXXII. Falstie-Jensen AM, Larsson H, Hollnagel E, Nørgaard M, Svendsen MLO, Johnsen SP. Compliance with hospital accreditation and patient mortality: a Danish nationwide

The Benefits of Accreditation for Healthcare Quality

- population-based study. *Int J Qual Health Care*. 2015; 27(3):165–74. <https://doi.org/10.1093/intqhc/mzv023>.
- LXXXIII. Griffith JR, Knutzen SR, Alexander JA. Structural versus outcomes measures in hospitals: a comparison of joint commission and Medicare outcomes scores in hospitals. *Qual Manag Health Care*. 2002;10(2):29–38. <https://doi.org/10.1097/00019514-200210020-00007>.
- LXXXIV. Falstie-Jensen AM, Bogh SB, Johnsen SP. Consecutive cycles of hospital accreditation: persistent low compliance associated with higher mortality and longer length of stay. *Int J Qual Health Care*. 2018;30(5):382–9. <https://doi.org/10.1093/intqhc/mzy037>.
- LXXXV. Miller MR, Pronovost P, Donithan M, Zeger S, Zhan C, Morlock L, et al. Relationship between performance measurement and accreditation: implications for quality of care and patient safety. *Am J Med Qual*. 2005;20(5):239–52. <https://doi.org/10.1177/1062860605277076>.
- LXXXVI. Arab M, Mousavi SM, Khesal AA, Akbarisari a. the effect of accreditation system on the key performance indicators of hospitals affiliated to Tehran university of medical sciences: an interrupted time series analysis in 2012-2014 [in Persian]. *J Hosp*. 2017;16(1):17–26.
- LXXXVII. Mosadeghrad AM, Shahebrahimi SS, Ghazanfari M. Exploring the relationship between accreditation and hospital performance: using data mining approach [in Persian]. *J School Public Health Inst Public Health Res*. 2018;16(1):33–50.
- LXXXVIII. Wardhani V, van Dijk JP, Utarini A. Hospitals accreditation status in Indonesia: associated with hospital characteristics, market competition intensity, and hospital performance? *BMC Health Serv Res*. 2019;19(1):372. <https://doi.org/10.1186/s12913-019-4187-x>.
- LXXXIX. Falstie-Jensen AM, Nørgaard M, Hollnagel E, Larsson H, Johnsen SP. Is compliance with hospital accreditation associated with length of stay and acute readmission? A Danish nationwide population-based study. *Int J Qual Health Care*. 2015;27(6):451–8. <https://doi.org/10.1093/intqhc/mzv070>.
- XC. Halasa YA, Zeng W, Chappy E, Shepard DS. Value and impact of international hospital accreditation: a case study from Jordan. *East Mediterr Health J*. 2015;21(2):90–9. <https://doi.org/10.26719/2015.21.90>.
- XCI. Janati A, Tabrizi JS, Toofan F, Algalandis K, Ebrahimoghli R. Hospital accreditation: what is its effect on quality and safety indicators? Experience of an Iranian teaching hospital. *Bali Med J*. 2016;5(2):303–7. <https://doi.org/10.15562/bmj.v5i2.241>.
- XCII. Mumford V, Reeve R, Greenfield D, Forde K, Westbrook J, Braithwaite J. Is accreditation linked to hospital infection rates? A 4-year, data linkage study of *Staphylococcus aureus* rates and accreditation scores in 77 Australian acute hospitals. *Int J Qual Health Care*. 2015;27(6):479–85. <https://doi.org/10.1093/intqhc/mzv078>.
- XCIII. Jarrah S, Judeh M, AbuRuz ME, Masa'Deh R. The impact of health care accreditation on patients' safety. *Int Med J*. 2019;24(3):129–39.
- XCIV. Leite CD, Pereira TC, Freitas MP, Tinôco NLW, Pereira FG, Menezes RVLV, et al. Effect of hospital accreditation process in outcomes of patients with acute coronary syndrome. *Int J Cardiovasc Sci*. 2019;32(6):607–14. <https://doi.org/10.5935/2359-4802.20190034>.
- XCv. Al-Sughayir MA. Effect of accreditation on length of stay in psychiatric inpatients: pre-post accreditation medical record comparison. *Int J Ment Health Syst*. 2016;10(1):55. <https://doi.org/10.1186/s13033-016-0090-6>.
- XCvI. Devkaran S, O'Farrell PN. The impact of hospital accreditation on quality measures: an interrupted time series analysis. *BMC Health Serv Res*. 2015; 15(1):137. <https://doi.org/10.1186/s12913-015-0784-5>.
- XCvII. Falstie-Jensen AM, Bogh SB, Hollnagel E, Johnsen SP. Compliance with accreditation and recommended hospital care—a Danish nationwide population-based study. *Int J Qual Health Care*. 2017;29(5):625–33. <https://doi.org/10.1093/intqhc/mzx104>.
- XCvIII. Devkaran S, O'Farrell PN, Ellahham S, Arcangel R. Impact of repeated hospital accreditation surveys on quality and reliability, an 8-year interrupted time series analysis. *BMJ Open*. 2019;9(2):e024514. <https://doi.org/10.1136/bmjopen-2018-024514>.
- XCIX. Bogh SB, Falstie-Jensen AM, Hollnagel E, Holst R, Braithwaite J, Johnsen SP. Improvement in quality of hospital care during accreditation: a nationwide stepped-wedge study. *Int J Qual Health Care*. 2016;28(6):715–20. <https://doi.org/10.1093/intqhc/mzw099>.
- C. Schmalz SP, Williams SC, Chassin MR, Loeb JM, Wachter RM. Hospital performance trends on national quality measures and the association with joint commission accreditation. *J Hosp Med*. 2011;6(8):454–61. <https://doi.org/10.1002/jhm.905>.
- CI. Mumford V, Greenfield D, Hogden A, Debono D, Gospodarevskaya E, Forde K, et al. Disentangling quality and safety indicator data: a longitudinal, comparative study of hand hygiene compliance and accreditation outcomes in 96 Australian hospitals. *BMJ Open*. 2014;4(9):e005284. <https://doi.org/10.1136/bmjopen-2014-005284>.
- CII. Barker KN, Flynn EA, Pepper GA, Bates DW, Mikeal RL. Medication errors observed in 36 health care facilities. *Arch Intern Med*. 2002;162(16):1897–903. <https://doi.org/10.1001/archinte.162.16.1897>.
- CIII. Braga AT, Pena MM, Melleiro MM. Metrics of assistance indicators of certified hospitals. *J Nurs UFPE Line*. 2018;12(3):665–75. <https://doi.org/10.5205/1981-8963-v12i3a230715p665-675-2018>.
- CIV. Bogh SB, Falstie-Jensen AM, Bartels P, Hollnagel E, Johnsen SP. Accreditation and improvement in process quality of care: a nationwide study. *Int J Qual Health Care*. 2015;27(5):336–43. <https://doi.org/10.1093/intqhc/mzv053>.
- CV. Lutfiyya MN, Sikka A, Mehta S, Lipsky MS. Comparison of US accredited and non-accredited rural critical access

The Benefits of Accreditation for Healthcare Quality

- hospitals. *Int J Qual Health Care*. 2009; 21(2):112–8. <https://doi.org/10.1093/intqhc/mzp003>.
- CVI. Al-Sughayir MA. Administered antipsychotic pro re nata medications in psychiatric inpatients. Pre- and post-accreditation comparison. *Saudi Med J*. 2014;35(2):172–7.
- CVII. Wang HF, Jin JF, Feng XQ, Huang X, Zhu LL, Zhao XY, et al. Quality improvements in decreasing medication administration errors made by nursing staff in an academic medical center hospital: a trend analysis during the journey to joint commission international accreditation and in the post-accreditation era. *Ther Clin Risk Manag*. 2015; 11:393–406. <https://doi.org/10.2147/TCRM.S79238>.
- CVIII. Nomura AT, Silva MB, Almeida MA. Quality of nursing documentation before and after the hospital accreditation in a university hospital. *Rev Lat Am Enfermagem*. 2016;24:e2813.
- CIX. Habib RR, Blanche G, Souha F, El-Jardali F, Nuwayhid I. Occupational health and safety in hospitals accreditation system: the case of Lebanon. *Int J Occup Environ Health*. 2016;22(3):201–8. <https://doi.org/10.1080/10773525.2016.1200211>.
- CX. Pourreza A, Mosadeghrad AM, Zoleikani P. The impact of accreditation on the performance of hospital emergency departments [in Persian]. *J Health Based Res*. 2017;3(3):277–95.
- CXI. Al-Sughayir MA. Does accreditation improve pro re nata benzodiazepines administration in psychiatric inpatients? Post-accreditation medical record comparison. *Int J Ment Health Syst*. 2017;11(1):16. <https://doi.org/10.1186/s13033-017-0124-8>.
- CXII. Salehian M, Riahi L, Biglarian A. The impact of accreditation on productivity indexes in Firoozgar hospital in Tehran [in Persian]. *J Health Adm*. 2015; 18(60):79–89.
- CXIII. Lindlbauer I, Schreyögg J, Winter V. Changes in technical efficiency after quality management certification: a DEA approach using difference-in-difference estimation with genetic matching in the hospital industry. *Eur J Oper Res*. 2016;250(3):1026–36. <https://doi.org/10.1016/j.ejor.2015.10.029>.
- CXIV. Okumura Y, Inomata T, Iwagami M, Eguchi A, Mizuno J, Shiang T, et al. Shortened cataract surgery by standardisation of the perioperative protocol according to the joint commission international accreditation: a retrospective observational study. *BMJ Open*. 2019;9(6): e028656. <https://doi.org/10.1136/bmjopen-2018-028656>.
- CXV. Lin F, Deng YJ, Lu WM, Kweh QL. Impulse response function analysis of the impacts of hospital accreditations on hospital efficiency. *Health Care Manag Sci*. 2019;22(3):394–409. <https://doi.org/10.1007/s10729-019-09472-6>.
- CXVI. Saquetto TC, Araujo CAS. Efficiency evaluation of private hospitals in Brazil: a two-stage analysis. *Rev Adm Mackenzie*. 2019;20(5): eRAMR190183.
- CXVII. Inomata T, Mizuno J, Iwagami M, Kawasaki S, Shimada A, Inada E, et al. The impact of joint commission international accreditation on time periods in the operating room: a retrospective observational study. *PLoS One*. 2018;13(9):e0204301. <https://doi.org/10.1371/journal.pone.0204301>.
- CXVIII. Pomey MP, Contandriopoulos AP, François P, Bertrand D. Accreditation: a tool for organizational change in hospitals? *Int J Health Care Qual Assur*. 2004;17(3):113–24. <https://doi.org/10.1108/09526860410532757>.
- CXIX. Park IT, Jung YY, Suk SH. The perception of healthcare employees and the impact of healthcare accreditation on the quality of healthcare in Korea. *J Hosp Adm*. 2017;6(6):20–7. <https://doi.org/10.5430/jha.v6n6p20>.
- CXX. Singh J. The patient satisfaction concept: a review and reconceptualization. In: Srull T, editor. *NA - advances in consumer research*. Provo, UT: Association for Consumer Research; 1989. p. 76–9.
- CXXI. Hirose M, Imanaka Y, Ishizaki T, Evans E. How can we improve the quality of health care in Japan? Learning from JCQHC hospital accreditation. *Health Policy*. 2003;66(1):29–49. [https://doi.org/10.1016/S0168-8510\(03\)00043-5](https://doi.org/10.1016/S0168-8510(03)00043-5).
- CXXII. Jha AK. Accreditation, quality, and making hospital care better. *JAMA*. 2018;320(23):2410–1. <https://doi.org/10.1001/jama.2018.18810>.
- CXXIII. Devkaran S, O'Farrell PN. The impact of hospital accreditation on clinical documentation compliance: a life cycle explanation using interrupted time series analysis. *BMJ Open*. 2014;4(8):e005240. <https://doi.org/10.1136/bmjopen-2014-005240>.
- CXXIV. Mumford V, Forde K, Greenfield D, Hinchcliff R, Braithwaite J. Health services accreditation: what is the evidence that the benefits justify the costs? *Int J Qual Health Care*. 2013;25(5):606–20. <https://doi.org/10.1093/intqhc/mzt059>.
- CXXV. Ivers N, Tricco AC, Trikalinos TA, Dahabreh IJ, Danko KJ, Moher D, et al. Seeing the forests and the trees—innovative approaches to exploring heterogeneity in systematic reviews of complex interventions to enhance health system decision-making: a protocol. *Syst Rev*. 2014;3(1):88. <https://doi.org/10.1186/2046-4053-3-88>.
- CXXVI. Paez A. Gray literature: an important resource in systematic reviews. *J Evid Based Med*. 2017;10(3):233–40. <https://doi.org/10.1111/jebm.122>
- CXXVII. Pappas C, Williams I. Grey literature: its emerging importance. *J Hosp Librariansh*. 2011;11(3):228–34. <https://doi.org/10.1080/15323269.2011.587100>.
- CXXVIII. Mitchell JI, Graham ID, Nicklin W. The unrecognized power of health services accreditation: more than external evaluation. *Int J Qual Health Care*. 2020;32(7):445–55. <https://doi.org/10.1093/intqhc/mzaa063>.
- CXXIX. Ng GK, Leung GK, Johnston JM, Cowling BJ. Factors affecting implementation of accreditation programmes and the impact of the accreditation process on quality improvement in hospitals: a SWOT analysis. *Hong Kong Med J*. 2013;19(5):434–46. <https://doi.org/10.12809/hkmj134063>