Effect of Joint Commission International Accreditation on Hospital Performance: a Systematic Literature Review

by

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Abstract

With over 160,000 hospitals worldwide, patients have more options than ever to seek both emergency and general medical care. However, the quality of health care services is consistently lowered with misdiagnosis, medication errors, and improperly trained staff a few of the most common hospital service problems negatively affecting patients in every country. The Joint Commission International (JCI) attempts to address poor quality of care by providing international hospital accreditation services through a single, high-quality standard. While JCI has over 900 accredited health organizations globally, does their process actually affect quality of care in hospitals? The objective of this essay is to review the literature exploring the possible influence of JCI's international accreditation on a hospital's quality of care and explore if and how this system can be improved. An online search found 19 articles representing 12 countries that examine the perceived impact JCI accreditation had on a hospital. The Donabedian model was used to characterize the possible improvements as relating to the structures, processes, or outcomes of the hospital. Overall, 17 of the articles (89.5%) described at least one positive impact on hospital quality attributed to accreditation. while 12 (63.2%) described at least one measure with no improvement. The main positives found were the staff's appreciation for accreditation, consistent improvements to medical documentation, and reduced nosocomial infections. Gaps in JCI standards related to community health and national awareness were noted. Measures not improved when correlated with JCI included staff workload, surgery lengths, and mortality rates. Associated

improvements to patient-related measures were the most inconsistent across literature. Greater focus on educating staff while reducing their workload, building nation-specific support systems, and supporting community health can propel JCI accreditation to be the international solution to the global lack of hospital quality.

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Preface

I would first like to thank the connections and mentors I found throughout the University of Pittsburgh Graduate School of Public Health. Professor Elizabeth Van Nostrand was my first interaction with the program when I called her after missing an online information session. From that first call, Professor Van Nostrand has been a constant source of encouragement, guidance, and enthusiasm that has made my experience at Pitt all the better. Despite primarily being in the MHA department, Dr. Kevin Broom always treated the HPM students as his own and was a great example of how professionalism and networking can promote you through life. I would also like to thank Drs. Lindsay Sabik and Cynthia Salter for taking the time to be a member of my committee. In particular, I could not have finished this essay without the support and advice of Dr. Sabik, and I thank her immensely for that.

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1.0 Introduction

With over 160,000 hospitals worldwide, people have more options than ever to seek both emergency and general medical care. Based on a 2006 World Health Organization (WHO) report, quality in health care services can be described by six characteristics: effectiveness, efficiency, accessibility, patient-approval, equitability, and safety.[1] However, a 2018 joint report from the WHO, the World Bank, and the Organisation for Economic Co-operation and Development found the quality of health care services is at unacceptably low levels.[2] Misdiagnosis, medication errors, harmful medical techniques, and improperly trained staff are the most commonly cited hospital service problems negatively affecting patients in every country.[2] Not only do these errors affect the patients, but this 2018 report also found that approximately 15 percent of hospital expenditures can be attributed to nosocomial infections caused by employee error.[3] The report provides examples of interventions that could improve the quality of health care services in hospitals, including implementing or refining clinical standards, improved training, medicine regulations, and safety protocols against avoidable risks.[3] While many of these interventions could have an impact individually, one intervention in particular encompasses all of the possible interventions: hospital accreditation.

Initially developed in the United States in the early 1900s, hospital accreditation involves public recognition by a hospital accreditation body that a hospital meets fundamental standards developed and evaluated through an independent peer assessment.[4] In practice, this means that a set of standards can be used to regulate employee training, medicine regulations, safety protocols, and any other factors related to patient care. There are many national iterations of these hospital accreditation organizations, but different organizations have different standards, leading to

inconsistencies across national boundaries. The United States-based Joint Commission International (JCI), overseen by the International Society for Quality in Health Care, attempts to address national variations in accreditation by providing accreditation services using a single standard internationally.[4,5] Since its inception in 1998, over 963 health care organizations have been JCI-accredited across 66 countries, making it the most widely used accreditation system worldwide.[6] JCI does not operate in the United States due to the national version (the Joint Commission) being the primary accreditation organization in the nation.[7] The standards for the Joint Commission and JCI are mostly similar due to their similar origin, but JCI made changes to remove any US-specific standards related to medical laws or technology.[7] The majority of JCI accreditations are in hospital programs (n=621, 64.5%), but ambulatory care programs, academic medical centers, and laboratories also have been JCI-accredited.[8] The United Arab Emirates houses the plurality of this JCI-accredited health care (n=198, 20.6%) with Saudi Arabia and Brazil following at 97 and 63 centers, respectively.[8]

JCI-accreditation is based on the *Joint Commission International Accreditation Standards for Hospitals*. This list of standards is meant to encompass guidelines on managing the organization, enhancing both staff and patient experiences, and allowing for continued growth even after accreditation.[5] Updated every three to four years, these international standards are developed through focus groups, literature reviews, advice from international experts in patient quality, and any evolving medical practices.[5] The 7th edition is the most recent version made effective in January 2021.[5] The accreditation standards are organized into four sections:

1. Accreditation Participation Requirements (Section I) that outline specific requirements for participating in and maintaining an accreditation

2. Standards related to providing patient care (Section II), including patient safety, surgical care, and access to care
3. Standards related to providing hospital management (Section III), including infection control, facility management, and staff education
4. Standards related to medical education and human research programs (Section IV) (for academic medical center hospitals only)

Further breakdown and examples of these standards can be seen in *Table 1*.

If a hospital can demonstrate a six-month record of compliance with the standards, it can apply for the JCI accreditation process. A team of JCI surveyors will be sent to the hospital to complete an on-site survey comparing information provided by the hospital and processes observed by the team.[9] This team's composition and duration can vary based on the size of the survey location, but it generally consists of a physician, a nurse, and an administrator surveying for approximately two to five days.[10] If the survey team decides that the organization and every individual department complies with the strict JCI standards, a status of "Accredited" will be awarded to the hospital for three years.[11] To renew this hard-earned recognition, the accredited hospital must go through the full process again.[12]

Despite its widespread adoption and its extensive standards, one question continues to plague JCI: is accreditation positively associated with quality of care? According to JCI, its accreditation is a definitive sign of quality care that sets a hospital apart from its competitors.[13] The opportunity to promote sustained reductions in metrics such as average length of stay, the rate of nosocomial infections, medical documentation error, and staff turnover through clear standards would likely have clear effects on patient health and experiences while receiving care at a JCI-accredited hospital. However, numerous reviews have tackled this topic and have produced

conflicting results. Brubakk et. al. concluded in their 2015 literature review that accreditation of hospitals could not be linked to measurable changes in quality of care while Avia et. al. found in their 2019 review that JCI accreditation had a significant effect on quality of services.[14,15] Bogh et. al. claimed in 2015 that accreditation had no effect on Danish hospital performance measures from 2004-2008, but then changed their conclusion to supporting accreditation in a subsequent study after reviewing measures from 2008-2013.[16,17] Even WHO, which recommended the use of accreditation to improve the quality of care services, acknowledges that the relationship is unknown.[3]

Therefore, it is the objective of this essay to review the literature exploring the association of JCI's international accreditation on a hospital's health outcomes and efficiency and explore if and how this system can be improved.

2.0 Methodology

Google Scholar was used to search for journal articles between 2010-2021 using the keywords “Joint Commission International,” “impact,” and “quality of care” to capture a wide range of relatively recent studies. Approximately 2180 articles were found. Search results were screened based on title, abstract, and the inclusion and exclusion criteria. The inclusion criteria were: (1) discussed the perceived influence that hospital accreditation had on hospital quality of care, (2) full article text was accessible for free or through the resources available at the University of Pittsburgh, and (3) the study was quantitative or qualitative in design. The exclusion criteria were: (1) abstract-only articles, (2) only discussed hospitals not accredited through JCI, and (3) written in other languages than English. No articles were excluded based on country of origin. Slight variations for the keywords were tested (e.g., “quality” instead of “quality of care”), but no significant change in the screened results were seen.

The Donabedian model was used to characterize the possible improvements described in the literature. This model was developed in 1966 to create a framework of three categories for evaluating the quality of care in health services: structure, process, and outcome.[18] The first category, “structure,” includes factors that affect a hospital’s physical resources, such as medical equipment, finances, and human resources, and the administrative processes that organize those resources, such as staff training.[18] Secondly, “process” encompasses any interaction between the hospital and the patient, such as diagnosis, treatment, care delivery, and patient education.[18] Finally, “outcome” involves any effect from health care on a patient, including patient satisfaction and changes to health.[18] The Donabedian model was chosen for this review due to its similarities

to the priorities of JCI standards, namely improving hospital structure and processes to affect patient outcomes, as well as its flexibility to be applied to almost any healthcare setting.

3.0 Results

3.1 Description of the Studies

Of the 2180 articles in the original search, 19 met the criteria and are included in this review.[19–37] Of these 19 articles, the plurality came from the Saudi Arabia (n=5, 26.3%) followed by UAE and Japan with three and two articles, respectively. Overall, 12 countries were represented in the 19 articles (Saudi Arabia, UAE, Japan, Belgium, Brazil, Colombia, Italy, Jordan, Palestine, Singapore, and South Korea). Retrospective observational studies and cross-sectional studies represented the two largest categories of study designs (n=5, 26.3%, respectively) with the other studies including case studies, descriptive-analytical studies, interrupted time series analyses, mixed method analyses, and qualitative studies. A breakdown of the article characteristics can be seen in *Table 2*. Overall, 17 of the articles (89.5%) described at least one positive hospital impact associated with accreditation while 12 (63.2%) described at least one measure that showed no improvement or negative perceptions following accreditation.

3.2 Articles Discussing Structures

From the 19 articles, nine (47.4%) discussed the influence that JCI-accreditation had on a hospital's structure.[19,20,22,27–31,36] An overview of the articles and their results regarding structure can be seen in *Table 3*.

Every article described at least some positive effect on structure from their data sources. The most common point (n=6, 66.6%) was the staff's appreciation for accreditation and belief that being accredited positively affected their hospitals.[19,20,29–31,36] Despotou et. al. had the most generic metric of approval as they solely asked for the respondent's "opinion on the impact of JCI on patient safety."[36] Nurses in the studies from Abolfotouh et. al., Al Shammari et. al., and Algahtani et. al. were asked about individual outcomes in patient safety on a Likert scale, and, based on the scores, respondents agreed that accreditation positively affected the hospital.[19,20,31] Some specific improvements, in the nurses' opinions, were related to nosocomial infection rates, educational training on quality, patient satisfaction, resource management, and medication errors.[19,20,31] Instead of a scoring mechanism, Al Shawan et. al., Van Bogaert et. al., and Poremski et. al. used interviews to get quotes on the medical staff's perceptions on accreditation.[29,30] Al Shawan et. al. reported a perceived positive impact of accreditation on quality and patient safety, processes, organization, and leadership while the Van Bogaert et. al. study specifically mentioned the opportunities for nurse involvement in the preparation for JCI accreditation.[29,30] Poremski et. al. claimed that departmental goals can be better aligned and informants can be better educated when following a set policy standard like JCI.[27] Additionally, 23 total structure, process, and outcome measures were perceived as improved by the health informants interviewed, including the culture of safety, staff qualifications, and fall rates.[27] The other two articles discussed data-verified improvements to the hospital structure. Halasa et. al. found that JCI-accreditation was associated with reduced staff turnover and some improved outcomes, effectively saving accredited hospitals approximately $100,000 per year.[22] No other papers discussed the costs or financing associated with accreditation. Finally, accreditation could improve a hospital's reputation solely

based on the well-known brand of JCI being recognized by the community as a quality standard of health, as discussed by Salim et. al.[28]

Seven of the nine articles discussed negative impacts to the hospital's structure associated with JCI accreditation. The primary theme, present in three articles, was the increased workload associated with the accreditation process was considered debilitating to the staff at times.[27,30,36] Al Shawan et. al., Despotou et. al. and Poremski et. al. discussed the health professionals' opinions that the increased time, effort, and resources needed to reach JCI-accreditation significantly affected staff enthusiasm, caused distractions that hindered patient care, and was seen by some as unsustainable.[27,30,36] The second most common theme was a lack of proper education for staff on the purpose of JCI-accreditation and their role in the process.[29,30] Both Al Shawan et. al. and Van Bogaert et. al. had interviewees disclose their dissatisfaction with communication on the accreditation process.[29,30] The Van Bogaert et. al. and Abolfotouh et. al. studies include nurses who specifically criticized the top-down style of accreditation that gave no systems for independent improvements or suggestions in the implementation process without management's approval.[19,29] Uniquely, Salim et. al.'s interviewees suggested that many JCI-seeking hospitals need national support in improving their reporting systems and fund allocation to be able to reach accreditation status.[28] Finally, Alhahtani et. al. noted how JCI accreditation does not specifically address community health needs and engagement, leaving those hospital structures completely untouched by the accreditation process.[31]

3.3 Articles Discussing Processes

From the 19 articles, nine (47.4%) discussed the influence JCI-accreditation had on a hospital's processes.[21–27,37] An overview of the articles and their results regarding processes can be seen in *Table 4*.

Similar to the structure papers, every article described at least some positive effect on processes from their data sources associated with JCI accreditation. The most common process improvement noted was with medical documentation; seven of the nine papers found that JCI-accreditation was associated with increased compliance, completeness, and quality of medical records and nursing documentation.[21–23,25,27,30,37] The second most common positive process change revolved around surgeries and anesthesiology, with five articles noting improvement in factors such as anesthesia induction time, pre-procedure time, and surgical or anesthesia consent completeness.[21,22,24,26,37] Okumura et. al. in particular found that accreditation was associated with a 7.3 minute decrease in total procedure time per patient on average.[26] Sustainability of these improvements to process metrics was also noted in two of the articles.[21,27] The 2019 Devkaran et. al. study and the Poremski et. al. study found that reaccreditation over numerous accreditation cycles supported not only an improvement to processes but also a reduction in their variability over time.[21,27]

Only four of the nine process articles had any mention of processes found to have little to no improvement associated with JCI accreditation.[21,24,27,37] Both the 2014 and 2019 Devkaran et. al. studies researched a number of process measures for improvement (19 and 12, respectively), and all of them did see improvement during the research periods.[21,37] However, eight of the 19 in the 2014 study, including patient medical assessments, were not found to be significant changes, and nine of the 12 in the 2019 study, including patient medical assessments, were found to have

high variability over the eight year timeframe.[21,37] Inomata et. al. found that the total surgery time did not change significantly between patients receiving surgery in the hospital pre- and post-JCI accreditation.[24] Furthermore, they found the pre-anesthesia time increased significantly after the hospital was accredited.[24] Poremski et. al. learned from their interviewees that unnecessary work arose due to a language barrier causing somewhat ambiguous JCI standards to be more complicated than intended.[27] Because instances like these caused an increase in workload, an unintended consequence of JCI found by Poremski et. was the use of shortcuts by staff in their daily processes to meet targets at the cost of effectiveness.[27]

3.4 Articles Discussing Outcomes

Nine of the 19 articles (47.4%) discussed the influence JCI-accreditation had on a hospital's outcomes.[21,22,28,30,32–35,37] An overview of the articles and their results regarding outcomes can be seen in *Table 5*.

Unlike the structure and process papers, only six of the nine outcome articles discussed improvements to the hospitals' outcome measures.[21,22,28,30,32,35] These articles were split between outcomes from patient medical data and outcomes from patient satisfaction surveys. The former includes Al Shawan et. al. who determined five outcome measures, including nosocomial infection rate, average length of stay, pressure ulcer rate, mortality rate, and bed occupancy, improved over the course of the full accreditation process.[30] Similarly, the 2019 Devkaran et. al. study found 15 outcome measures that improved with minimal variability over an eight-year period of three JCI accreditation surveys, including nosocomial infection rate, readmission rate within 48 hours, pressure ulcer rate, and adverse event rate.[21] Halasa et. al. and Salim et. al. found only a reduction

in the return rate to the intensive care unit after discharge and the nosocomial infection rate, respectively.[22,28] For patient satisfaction outcomes, de la Puente Pacheco et. al. found that patients treated in accredited hospitals reported a higher perception of the hospital's quality than those treated in non-accredited hospitals.[35] Similarly, Asl et. al. found a correlation between observing JCI standards and an increased interest from health tourists due to the perceived high quality.[32]

Five of the nine articles detailed some outcomes showed no improvement associated with accreditation.[22,30,33,34,37] Al Shawan et. al saw no improvement to the rate of patients leaving the ER without being seen, the percentage of OR cancelations, or the rate of patient falls.[30] Additionally health providers in this study mentioned how these types of key performance indicators (KPIs) could have a potential bias to them due to an improvement in detection measures artificially increasing some outcomes, such as patient falls.[30] When comparing a JCI-accredited hospital to a nationally-accredited hospital in Italy, Campra et. al. found no significant difference in outcome mortality rates between the hospitals.[34] The 2014 Devkaran et. al. study determined that mortality rate and Methicillin-resistant Staphylococcus aureus (MRSA) infection rates remained unchanged and surgical site infection rates increased during the accreditation process.[37] When comparing accredited hospitals to non-accredited hospitals, Halasa et. al. found that the readmission rate to the hospital within 30 days and the return rate to surgery within 24 hours were slightly greater in the accredited locations.[22] Finally, with regards to patient satisfaction, Barghouthi et. al. found no significant differences between the average patient satisfaction of a hospital and its accreditation status, concluding that patient perspective should be given more importance in health systems than accreditation.[33]

3.5 JCI-Accreditation Life Cycle

Three articles utilized an "accreditation life cycle" method for discussing how changes to different metrics occurred throughout the accreditation process.[21,30,37] Developed by Devkaran et. al. in their 2014 article, the accreditation life cycle is split into 4 phases: initiation, pre-survey, post-accreditation, and stagnation.[37] The initiation phase involves the hospital implementing new JCI standards and improvements to the hospital overall to prepare for the JCI accreditation.[37] Presurvey involves the 3-6*month window before the official JCI survey where the hospital records its compliance measures and fixes any gaps that may still be present in the policies.[37] The post-accreditation status occurs immediately after receiving the accreditation status and is followed by the stagnation phase a few months later.[37] Devkaran et. al. hypothesized that the change in JCI standard metrics would vary based on the current phase of the life cycle; to that end, they found that measures increased significantly during the initiation and presurvey phases, dropped significantly immediately following accreditation, but then leveled out at a greater value than before accreditation.[37] Devkaran et. al. believed this slump in compliance and improvement post-accreditation was due to a lack of incentive after reaching the desired goal, but did note that, overall, the measures improved from the start of initiation to the end of stagnation.[37] The 2019 Devkaran et. al. study and the 2021 study by Al Shawan et. al. use the same life cycle model in their analyses but with different time frames and different measures; however, these studies found the same relationship of increasing, decreasing, and finally leveled out values over the length of a full accreditation process.[21,30]

4.0 Discussion

The findings of this review support that, despite some flaws, JCI hospital accreditation may play a role in improving the quality of hospital structure, medical processes, and patient outcomes. A total of 17 articles (89.5%) described at least one positive hospital impact associated with accreditation while only 12 (63.2%) described at least one measure with no improvement following accreditation. This review primarily focused on results regarding health outcomes and hospital efficiency. Prioritizing reductions to metrics such as average length of stay, the rate of nosocomial infections, documentation error, and staff turnover have clear effects on the health and experience of patients in a JCI-accredited hospital.[21,22,25,30,37] Even if accreditation was associated with no direct impacts on health, perception of improved health from both the staff and the community at large can be a major boon for the hospital in building staff involvement and public trust.[3]

Using the Donabedian model to stratify the results, structure metrics, or those relating to physical resources in the hospital, were found to be mostly positively influenced by the accreditation process. Most studies highlighted how hospital staff have a high perception of the impact accreditation can have on their hospital, especially with regards to patient safety and satisfaction improvements.[19,20,27,29–31,36] These results were captured in Likert scale questionnaires with average perceptions never dropping below a 3-out-of-5 and in interviews with numerous quotations praising the accreditation's impact.[19,20,27,29–31,36] Data-driven improvements to staff-turnover, finances, and branding were also noted.[22,28] However, finances were only discussed in a single paper (Halasa et. al.) despite being a possibly major factor in whether a hospital has the resources for pursuing accreditation.[22] Future studies should include cost-benefit

analyses in their JCI evaluations determine the influence accreditation has on a hospital's finances. While the improvements were clear, so too were the issues with the structure metrics. In particular, an increased workload on nurses without proper education on and involvement in the accreditation process created opportunities for distraction, resentment, and apathy to infect the staff.[19,27,29,30,36] This lack of nurse perspective was found in other recent reviews of hospital accreditation as well.[15,38] Alkhenizan et. al. explain well in their review how "…skepticism of healthcare professionals in general…about the positive impact of accreditation programs…" is one of the most important barriers to overcome when implementing the accreditation system; education and involvement from staff at all levels would likely be a straightforward way to reducing misunderstandings around hospital accreditation.[38] Uniquely, Salim et. al. discussed the need for JCI-seeking hospitals to connect with national support in improving their reporting systems and fund allocation.[28] If JCI would like to expand its international locations, coordination with national-level organizations could facilitate the improvements needed for lesser-resourced hospitals to reach the JCI standard. Another distinctive flaw was how JCI has no mention of community health or engagement in their standards.[31] With numerous national and international initiatives across the world seeking to improve health and health education in communities, JCI could leverage its position to influence high quality hospitals to perform outreach in their communities.

Using the Donabedian model's characterization of process metrics, or any interactions between the hospital and the patient, again the results are primarily positive. Medical documentation and reporting were the main focus for improvement with increases in compliance, completeness, and quality of the records.[21–23,25,27,30,37] Two studies also found that improvements to processes remained consistent through numerous reaccreditation attempts.[21,27] However, there

was some disagreement regarding the association between accreditation and surgery duration. Okumura et. al., for example, correlated a 7.3 minute decrease in total procedure time per patient on average with accreditation.[26] Inomata et. al., however, found that the total surgery time did not change significantly in their sample and the pre-anesthesia time increased significantly.[24] Interestingly, these studies used the exact same data set of surgeries performed at Juntendo University Hospital between 2014-2016, but Inomata et. al. included all surgeries while Okumura et. al. only reviewed cataract surgeries.[24,26] Because of this distinction, Inomata et. al. had more than 10,000 more observations than Okumura et. al., and their results indicate there may not be an impact on surgery duration across surgeries of all types.[24,26] Among the other studies, patient medical assessments were also found to have no significant improvements associated with accreditation despite being a core goal for the JCI standards.[21,37] The studies do not discuss why the different metrics they tested were found to be significantly changed or not, so future studies should review the patient assessment standards more directly to ensure the current JCI standards are having the intended effect on performance.[21,37] Finally, Poremski et. al. found that language barriers and standard shortcuts were a problem in performing processes during accreditation.[27] These flaws related back to the strategies of a JCI-national cooperation (i.e., reduces language barriers) and a reduced workload on staff (i.e., reduces the temptation for shortcuts) as possible mitigation tools against the faults in JCI accreditation.

Lastly, the Donabedian model's outcome metrics involving any effect from health care on a patient was the domain with the most inconsistency in findings across studies. For example, two studies found accreditation to be correlated with an improvement to mortality rates while two others found no significant difference.[21,30,34,37] Similarly, Halasa et. al. found a reduction in the readmission rate of the ICU supported by accreditation but not the readmission rate of the hospital

in general or the rate of returning to surgery.[22] The association of accreditation with patient satisfaction is also inconsistent as de la Puente Pacheco et. al. found those treated in accredited hospitals reported higher satisfaction while Barghouthi et. al. found no significant difference in satisfaction based on accreditation.[33,35] These conflicting results could be related to hospital conditions, as Bogh et. al. determined that the condition and type of care in a hospital can, to some extent, predict the effectiveness of accreditation improving quality of care.[39] These studies also represent different countries with different challenges and different national regulations to follow, which could play a role in their ability to improve outcome metrics. One consistent improvement across numerous studies appeared to be a reduction in nosocomial infection rates associated with JCI accreditation.[21,28,30]

While not within the initial scope of this review, the JCI accreditation life cycle was a useful tool for understanding the flow of improvements across the accreditation process.[37] Future studies should review the outline of Devkaran et. al. to determine if their accreditation data can be parsed into the four phases. Given how contradictory the outcome measures were across studies, a standardized method of reporting the progress of improvement in different measures across the life cycle could be a useful strategy for more clearly comparing changes rather than reviewing the entire process at once.

While this literature review was thorough regarding the available studies on JCI accreditation evaluation, some limitations must be considered. Primarily, few of the studies' results are able to definitively support the relationship between JCI accreditation and improved hospital quality of care. The results mostly relied on the perceptions of medical staff interviewed at the hospital, and most that did include objective measurements did not include control groups for comparison against the hospital undergoing hospital accreditation. It is not possible to know

whether the improvements to quality metrics are due to accreditation or to other national or seasonal changes as it is only known that these hospitals improved during the process from their initial state. Halasa et.al. were able to solve this limitation by surveying patient data from accredited acute general hospitals with matched non-accredited hospitals as the control group.[22] Future research with objective outcome measurements should use control groups of matched non-accredited hospitals to the accredited hospitals, similar to the method of Halasa et.al., for more conclusive results. Secondly, this review intentionally avoided information on solely national hospital accreditation systems. If JCI would plan to work with or against national systems, additional research into direct comparisons between JCI-accredited and nationally-accredited hospitals would clarify how each country could interact with the JCI system. Similarly, this review does not compare other interventions for improving quality of care, such as licensing of providers and public reporting, against accreditation.[1] While an integrated accreditation system could cover numerous interventions, future research should determine if any intervention not compatible with an accreditation system could have a greater impact on quality of care.

5.0 Conclusions, Recommendations, and Public Health Implications

While hospitals continue to grow in number and size around the world, quality of care continues to be overlooked.[2] With numerous flaws in hospital care needing to be tackled, accreditation systems provide a standard of policies that can be consistently implemented in any location.[3] Based on the available literature, the Joint Commission International hospital accreditation program has been a catalyst to positively affect many hospitals that have undergone its rigorous accreditation process, particularly regarding structure and process measures. As JCI has already begun to spread across the world and covered the greatest number of hospitals of any hospital accreditation system, it is recommended that JCI continue to be implemented in as many hospitals as possible.

While this implementation continues, however, the JCI accreditation process can be improved. Greater focus on involvement from and education in all levels of hospital staff would allow for less confusion in how certain standards are being applied as well as staff empowerment during the process.[19,27,29,30,36] Similarly, reducing the workload on nursing staff over short periods of time could limit staff burnout or reduced patient care quality.[27,30,36] While the JCI standards should not be diminished to reduce this burden, it could be in JCI's best interest to work with hospitals seeking accreditation to determine preferred timeline rather than leaving hospitals to determine this independently and ineffectively. JCI should also work with nations individually, especially low-to-middle-income countries, to determine any nation-specific support systems needed for local hospitals to best reach JCI accreditation.[28,34] Finally, drafting new standards for community health to expand the influence of health care and healthy living outside of the hospital walls would be a worthwhile addition to JCI's current guidelines.[31] These standards could include

developing a community health assessment, introducing a process for community education programs, or promoting community representatives on leadership boards. It would be unfair to attribute all of these changes as solely under JCI's control, though, so promotion of these accreditation improvements from the hospitals' perspective would ensure both sides of the accreditation process are working to improve conditions in health care organizations. Without a consistent metric to grade and improve hospitals, quality of care would continue to vary significantly both within and across country borders. Studies like this allow for the review of the merits of accreditation systems that could be utilized to create an internationally-recognized standard for quality hospital care.

6.0 Tables

Table 1. Examples of JCI Accreditation Standards by Section. The sections are divided into goals which each have more specific standards. Section IV is not included due to only applying to academic medical center hospitals.

Section/Chapters	Example Goal	Example Standard
Accreditation Participation Requirements (Sec. I)	N/A	The hospital provides JCI with accurate and complete information throughout all phases of the accreditation process.
Patient-Centered Standards (Sec. II)		
International Patient Safety Goals	Identify Patients Correctly	The hospital develops and implements a process to improve accuracy of patient identifications
Access to Care and Continuity of Care	Admission to the Hospital	The hospital has a process for managing the flow of patients throughout the hospital that includes admitting inpatients and registering outpatients
Patient-Centered Care	Patient and Family Rights	Patients are protected from physical assault, and populations at risk are identified and protected from additional vulnerabilities
Assessment of Patients	Radiology and Diagnostic Imaging Services	Quality control procedures are in place, followed, validated, and documented
Care of Patients	Resuscitation Services	Resuscitation services are available throughout the hospital
Anesthesia and Surgical Care	Anesthesia Care	A qualified individual conducts a preanesthesia assessment and preinduction assessment
Medication Management and Use	Ordering and Transcribing	The hospital identifies safe prescribing, ordering, and transcribing practices and defines the elements of a complete order or prescription
Health Care Organization Management Standards (Sec. III)		
Quality Improvement and Patient Safety	Analysis and Validation of Measurement Data	The hospital uses a defined process for identifying and managing sentinel events
Prevention and Control of Infections	Food Services	The hospital reduces the risk of infections associated with the operations of food services
Governance, Leadership, and Direction	Chief Executive(s) Accountabilities	A chief executive(s) is responsible for operating the hospital and complying with applicable laws and regulations
Facility Management and Safety	Fire Safety	The fire safety program includes measures to ensure safe exit from the facility when fire and non-fire emergencies occur
Staff Qualifications and Education	Planning	Leaders of hospital departments and services define the desired education, skills, knowledge, and other requirements of all staff members
Management of Information	Patient Medical Record	Every patient medical record entry identifies its author and when the entry was made in the medical record

Table 2. Characteristics of reviewed studies.

Characteristics	n	Percent
Countries	***19***	***100%***
Saudi Arabia	5	26.3%
UAE	3	15.8%
Japan	2	10.5%
Belgium	1	5.3%
Brazil	1	5.3%
Colombia	1	5.3%
Iran	1	5.3%
Italy	1	5.3%
Jordan	1	5.3%
Palestine	1	5.3%
Singapore	1	5.3%
South Korea	1	5.3%
Study Design	***19***	***100%***
Cross-sectional	5	26.3%
Retrospective observational	5	26.3%
Case study	2	10.5%
Descriptive-Analytical	2	10.5%
Interrupted time series analysis	2	10.5%
Qualitative	2	10.5%
Mix method	1	5.3%

Table 3. Results Discussing JCI's Impact on Hospital Structure by Article.

Author	Data Source	Improvements to Structure	No Improvements to Structure
Abolfotouh	Nursing staff at King Khalid Hospital	Respondents agreed that accreditation has positive impact on patient safety, healthcare associated infections, nursing documentation, and patient medication information	*Nurses are not rewarded and recognized for improving quality *No system for nurses to make suggestions to management on how to improve quality.
Al Shammari	Nursing staff from 1000-bed King Abdulaziz Medical City	Significant association between accreditation perception and the overall perceived quality of health care and all its domains, among nurses	N/A
Al Shawan	KPIs and health providers from King Fahd Hospital of the University, 550 beds	Process was perceived to improve quality and patient safety, processes, organization, and leadership	Process was perceived to increase workload, have limited education, be unsustainable, and cause misinterpretation of data
Algahtani	Health professionals from 1000-bed King Abdulaziz Medical City	The mean (standard deviation) of scores on a 5-point Likert scale were 3.79 (0.68) for participation in accreditation, 3.85 (0.84) for benefits, and 3.54 (1.01) for quality of results.	Does not specifically address community health needs and engagement
Despotou	Tertiary hospital nurses	An overarching positive attitude toward accreditation was found.	The effort to obtain accreditation was identified as one downside
Halasa	Patient data from 2 private accredited acute general hospitals with matched non-accredited hospitals	*Reduction in staff turnover *Total savings of US$ 98,885/accredited hospital/year	N/A
Poremski	Key informants at 2000-bed mental health institution	*Accreditation allowed for alignment of departmental goals with new accreditation standards *Accreditation gave informants broader understanding of the hospital and staff *Participants named 23 total process and outcome measurements improved by accreditation	*Accreditation is labor intensive *Diminishing enthusiasm in staff can reduce sustainability
Salim	Interviews with senior health officials and KPI data from Dubai Hospital Infection Control	Accreditation was considered a well-known brand to be recognized as a safe healthcare facility	Recommends improving the surveillance and reporting systems at the national level and providing proper fund allocation for JCI-seeking hospitals
Van Bogaert	Nurse interviews from 600-bed university hospital	Staff nurses recognized the opportunities JCI structural empowerment provided within their daily practice	*Effect on quality of care and patient safety was unclear by staff *Reasons for several initiatives taking place in the hospital were unclear by staff *Perceived as top-down implementation, staff nurses felt that they could only make decisions when management allowed

Table 4. Results Discussing JCI's Impact on Hospital Processes by Article.

Author	Data Source	Improvements to Processes	No Improvements to Processes
Al Shawan	KPIs and health providers from King Fahd Hospital of the University, 550 beds	4 process measures had significant improvement during the accreditation cycle	N/A
Devkaran, 2014	Patient records from 150-bed multispecialty hospital	Initial phase of accreditation shows a significant improvement in compliance with JCI standards in 11 quality process measures while post-accreditation shows a brief decrease followed by stagnation	8 quality process measures saw improvement, but not significantly
Devkaran, 2019	Patient data from 650-bed tertiary academic hospital	Accreditation sustained improvements in 3 process measures over 8 years	9 process measures, while improved overall, had high variability over 8
Halasa	Patient data from 2 private accredited acute general hospitals with matched non-accredited hospitals	Increased completeness of medical records	N/A
Hossam Attia	Medical records from private 30-bed hospital	Improvement in compliance with complete medical records' documentation after the JCI accreditation	N/A
Inomata	Patients who received elective and emergency surgeries under general anesthesia at Juntendo University Hospital pre- and post-JCI	Reduction in anesthesia induction time	*Total procedure/surgery time did not change significantly *Pre-anesthesia time significantly increased
Nomura	Nursing documentation pre- and post-JCI from 850-bed public university hospital	Significant improvement in the quality of nursing documentation	N/A
Okumura	Cataract surgery patients pre- and post-JCI	Pre-procedure time and total procedure time decreased (~7.3 minutes per patient)	N/A
Poremski	Key informants at 2000-bed mental health institution	Reaccreditation supported a reduction in process variability over time	*Unnecessary processes arose from overinterpretation of the standards *Increased workload can lead to workarounds

Table 5. Results Discussing JCI's Impact on Hospital Outcomes by Article.

Author	Data Source	Improvements to Outcomes	No Improvements to Outcomes
Al Shawan	KPIs and health providers from King Fahd Hospital of the University, 550 beds	5 outcome measures had significant improvement during the accreditation cycle	*No improvement in: *Rate of patients leaving the ER not seen *Percentage of OR cancelations *Rate of patient falls *Potential bias in observation-based key performance indicators
Asl	5 private health tourist hospitals with high accreditation rankings	Relationship between observing JCI-standards and increased health tourists to a country	N/A
Barghouthi	Patient satisfaction quality assessment in Al Makassed and Al-Arabi Hospitals	N/A	*No significant differences between the means of patient satisfaction attributed to accreditation status *Patient perspective should be given more importance in health systems than accreditation
Campra	Medical metrics from 8 specialist healthcare facilities	N/A	No differences in outcome mortality rates between hospitals accredited according to standards by JCI versus nationally-accredited hospitals (in Italy)
de la Puente Pacheco	Foreign patients from 2 JCI-accredited hospitals and 1 non-accredited hospital	Patients treated in accredited hospitals had a higher quality perception than the non-accredited group	N/A
Devkaran, 2014	Patient records from 150-bed multispecialty hospital	N/A	*Mortality rate and MRSA infection rate did not significantly change *Surgical site infection rate increased, but not significantly
Devkaran, 2019	Patient data from 650-bed tertiary academic hospital	Accreditation sustained improvements in 15 outcome measures over 8 years	N/A
Halasa	Patient data from 2 private accredited acute general hospitals with matched non-accredited hospitals	Reduction in return to intensive care unit (ICU) within 24 hours of ICU discharge	Readmission to hospital within 30 days and return to surgery within 24 hours were slightly greater in accredited than non-accredited
Salim	Interviews with senior health officials and KPI data from Dubai Hospital Infection Control	*Reduction in incidence of numerous nosocomial infections following accreditation *Improved surveillance policies to identify numerous nosocomial infections following accreditation	N/A

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