

Developing Hospital Managing Systems in Iraq by using multi-level Accreditation: Case study for a sample of hospitals in Nineveh Governorate

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ABSTRACT

The study aims at developing the reality of the Iraqi hospital management systems by applying international accreditations for hospitals, which in turn works to enhance the quality of health services in the Iraqi reality and the possibility of changing the current Iraqi health system. The implementation of a new system by the recommendations and standards of the Joint Commission International (JCI) is the most important leading institution in this field. It included the use of a tripartite scale to measure the gap (implemented, partially implemented, not implemented) within five hospitals in Iraq within Nineveh Governorate, namely (Ibn Sina, Al-Salam, Al-Jumhuri, Al-Medina, and Al-Zahravi hospitals). This is done according to three levels (Basic, Fundamental, and Advanced) to accurately detect the gap. While carefully applying the criteria with evidence for each of the main criteria (13) within these three levels, each main criterion includes a set of sub-indicators to evaluate the main criterion. International hospital accreditations will work to improve the capabilities of the Iraqi health sector through the ability to accurately identify gaps by dividing them into levels according to the best international assessments and practices, as well as strengthening the capabilities of the Iraqi health sector to allow it to be developed in proportion to its entry into the market. Globally competitive health care by achieving the goals of Iraqi hospitals in providing the best service to patients and the possibility of global cooperation in the health sector.

Keywords: Hospital Management Systems, Hospital Accreditations, Joint Commission International (JCI), Healthcare Quality.

1. INTRODUCTION

In the modern era, quality monitoring assessment has become among the basic concepts that indicate the level of health service provided. There have been widespread developments to improve the quality of health

services at the global level. Institutions have begun to unify their efforts to establish unified global standards, and health organizations seek to achieve quality in services. Provided by health organizations. In June 2011, JCI was examined against its audit, quality, and standards process and was accredited by the International Society for Quality in Healthcare (ISQua)[1].

The accreditation process carried out by the Joint Commission International has been proven on the international scene. In Denmark, which is one of the leading European Union countries that are leaders in the field of hospital accreditation and that has achieved improvement in their healthcare system, which implemented the program Joint Commission on Accreditation of Healthcare Organizations (JCAHO), with the Danish Healthcare Quality Program. Through applying global accreditation, Denmark achieved improvements to the health system, the most important of which was that patients who recovered in hospitals with international accreditation, whose evaluation results were high, had a much lower mortality rate than hospitals, which do not have global accreditation [2]. The United Arab Emirates is also the first leading country in achieving comprehensive digital health coverage and providing internationally accredited home health care due to the implementation of hospital accreditations in all its health institutions [3].

Therefore, the Iraqi health institutions need to move towards knowing the status of Iraqi hospitals compared to global performance by evaluating health institutions according to international standards, and looking for a possibility of obtaining an international health accreditation certificate, which has become part of the competition between Iraqi hospitals, given the presence of many problems they face. The Iraqi health status in terms of performance compared to developed countries requires developing the Iraqi health system to integrate with international standards, accurately identifying gaps, and simplifying procedures to continuously improve the quality of services provided and the possibility of applying international standards and indicators.

2. RELATED WORK OF ACCREDITATION

At present, specific information is available about the possibility of achieving accreditation in all Iraqi hospitals, through which the institution seeking accreditation evaluates the quality of its services and determines whether this institution can meet the standards set to maintain and improve the quality of health care provided [4]. These guidelines are the requirements and standards necessary to determine the extent of quality and achieve a high level of quality and safety, enhance patient safety, and improve the patient experience in hospitals [5]. Any hospital will be considered eligible when it meets the applicable Joint Commission standards, which is an examination system by experts to ensure that the health institution adheres to strictly applying these standards [6].

Below are studies of Joint Commission accreditation systems in global health institutions and the goals they achieved by measuring system quality that were identified in Scopus-indexed journals and PubMed (refer to Table 1).

Table 1 Comparison of achieved goals of related work

Author	year	Research Result	Reference
Zhang HongFan, et al .	2023	Research on Chinese hospital leaders and their awareness of the impact of JCI accreditation demonstrates that the presence of global standards improves leadership and hospital safety, improves care processes, and improves the quality of care and learning culture. As well as enhancing reputation, better cost containment, and a sense of pride among employees in hospitals accredited by the Joint Commission International	[7]

Vuohijoki Anni, et al.	2023	Studying the application of Joint Commission International accreditation standards in Finland at Orton Orthopedic Hospital to develop patient safety and its role in achieving job satisfaction for employees working in hospitals due to quality performance and achieving well-being.	[11]
El Karaoui, Abdul K., Assaf, Nada.	2023	The study examines the evaluation of laboratories in hospitals through the SLIPTA Laboratory Evaluation Checklist as a first step to meeting JCI standards through a set of 109 standards, measuring areas for improvement and addressing some components to ensure readiness for JCI accreditation.	[15]
Rima Ramzi, et al.	2022	The research indicated that implementing the Joint Commission International standards in Lebanese hospitals increases the efficiency of employee productivity and quality through managing change, participating in decision-making, and identifying weak points.	[12]
Shawan Deema Al.	2021	Research to measure the effectiveness of the Joint International Commission in improving the quality of hospitals in the Kingdom of Saudi Arabia through the use of parallel methods and quantitative analysis found that there is an improvement in the average length of stay, the spread of infection, the bed occupancy rate, and a reduction in the proportion of critical cases.	[8]
Patrizia Riva, et al.	2021	The study investigates the possibility of obtaining better results for the health structures of hospitals accredited by the Joint Commission International in Italy based on the quality of service and measuring the risk and mortality ratio due to its importance in the fields of health tourism and health treatment between hospitals.	[14]
Mazyar Karamali, et al.	2020	A study that included 6661 documents through cluster analysis in the field of hospital accreditation in the period from 1975 to 2018 located in the United States, Italy and Canada, and the Joint Commission International was the most frequent and has a close relationship with quality improvement, patient safety, risks and standards.	[9]
ByLiu Jilan, et al.	2019	The role of JCI standards in improving quality and safety in Chinese health institutions through modern technology is to permanently develop standards.	[13]
Ángel Fernando, et al.	2018	Classification of Mexican hospitals in the process of issuing accreditation certificates through a cross-sectional study. The study found that the best classification is standards consistent with the standards of the Joint Commission International (JCI).	[10]

4. METHODS

Given the size of the gap between the Iraqi health system and the global health system, and to reduce the gap to keep pace with global development more easily between Iraq and developed countries, hospital accreditation was applied within three levels for each level has the main 13 indicators (Rights of patients and their families, Access to and continuity of healthcare, Human Resources, Patient Care, Improving quality and

patient safety, Support Services, Medical Records, Medical Staff, Management & Leadership, Education & Training, Information management, Control Infection, and Use of medicines and pharmacy), to measure the accuracy of the system according to the new accreditation, where the levels include: [16]

Basic level (131) standards: These are the standards that relate to determining the minimum standards and requirements necessary to ensure the provision of health services safely and effectively. They focus on ensuring basic healthcare and access to it, providing the necessary supplies and medicines, ensuring the safety of patients, and protecting their rights and families by providing basic health services and prevention, preserving patients' lives from death or severe risks.

Fundamental level (91) standards: These are the standards that are concerned with determining the level of health service quality by quality standards to improve health service by reviewing the procedures and system in place in the hospital and the extent of its compatibility with international standards for the comfort of the patient and their families and protecting them from complications or preventing diseases. These standards focus on eliminating harm and unjustified spending in the field of healthcare for patients through evidence-based scientific studies or international standards in providing healthcare. [17]

Advanced level (65) standards: These standards evaluate the extent of the shift towards providing electronic health services in hospitals, the possibility of moving towards a smart hospital, the reality of its application, and the availability of electronic infrastructure and platforms to move towards electronic healthcare and participation in the global medical field. This includes telemedicine, home medical care, technology for remote intensive care follow-up services, artificial intelligence for health decision support, and the virtual clinics platform, that enable transforming health institutions into an advanced level of service provision for all areas in Iraq. [18]

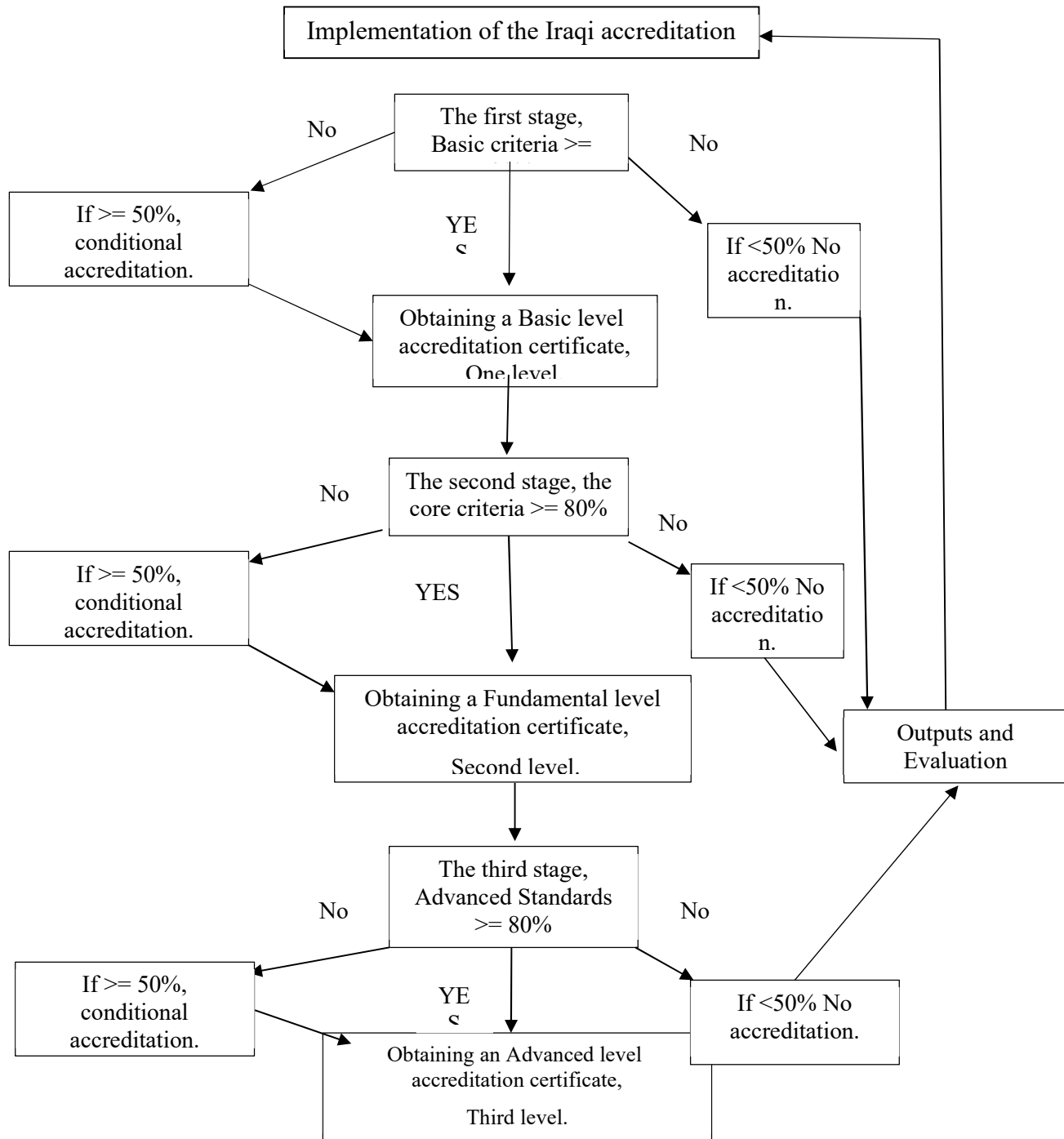
Implementing accreditation in Iraqi health institutions to accurately assess their level of performance through an internal self-evaluation system for each health institution that includes the Joint Commission International (JCI) standards according to the algorithm and as in Figure No. (1).

Our research approach was to apply the progressive wedge approach in a simplified, step-by-step manner to hospital accreditation, where the health system for hospital management will be divided into (13) main standards. Each standard has sub-indicators, and these main standards are also divided into three levels (Basic, Fundamental, and Advanced). We can determine the strengths and weaknesses of each standard and at any level according to tangible evidence and precise measurement to reach more accurate results than previous systems. The accreditation certificate is granted according to the health institution's efficiency and evaluation at each level, as follows: -

- If the hospital achieves an average of 80% or more of the total average of the main standards (13) standards, this percentage will qualify it to move to the next higher level and obtain an accreditation certificate.
- If it obtains a grade between (79% and 50%), the accreditation is conditional, meaning that it moves to the higher level on a conditional basis.

However, if a grade of less than 50% is obtained, one cannot move to the final stage, meaning there is no accreditation.

Figure 1. The main architecture for implementing and evaluating the Iraqi accreditation of hospitals



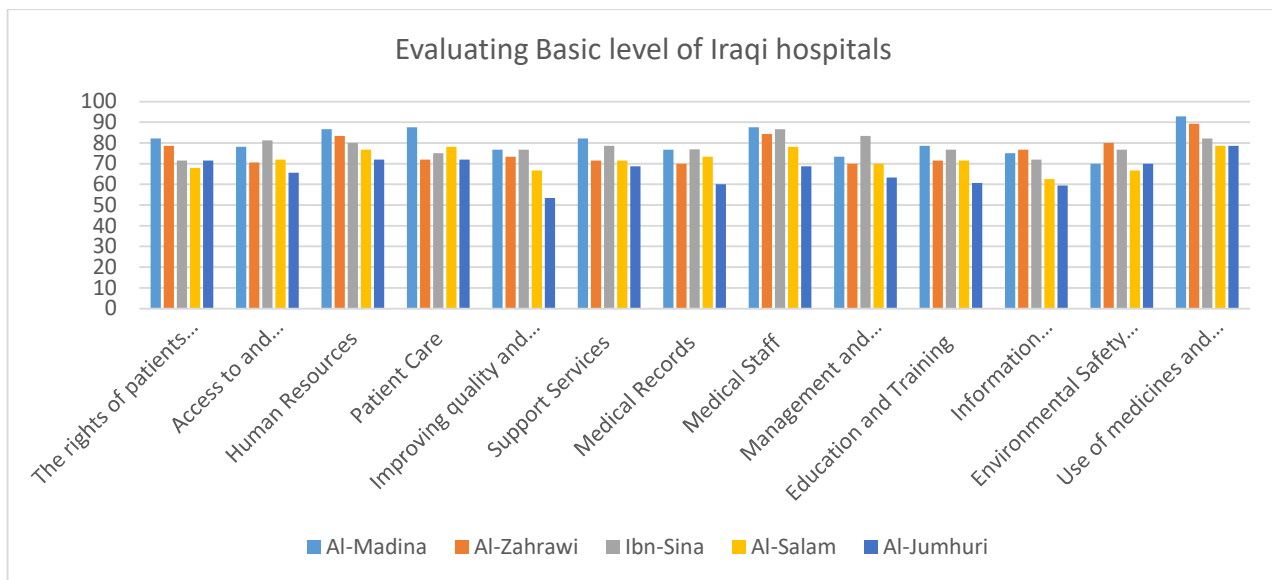
5. RESULTS AND DISCUSSION

Each hospital was provided with standards through an electronic system to conduct self-evaluation, and efforts were invested within the hospital to direct it to raise the level of performance and improve service without the need for frequent external evaluation. The evaluation takes place within the health institution (implemented, partially implemented, not implemented), and after uploading evidence, and documents clearly and transparently, the results appear. Immediately, the indicators were calculated for each sub-criterion within the main (13) indicators, as in the equations:

- Result = (Weight * Repeats).
- Arithmetic mean= ($\frac{\text{Total repetitions}}{\text{The number of sub-criteria}}$).
- Application percentage= ($\frac{\text{Arithmetic mean}}{2} * 100$).
- Gap size for each criterion (100 - Application percentage).

Basic level: We note that the results of the evaluation according to the new system for the first or basic level were as in Figure 2. Evaluation of the basic level of Iraqi hospitals according to international accreditations. We note at this basic level that most hospitals provide the infrastructure requirements of basic equipment necessary to provide services and care. Health services are doing well, with variations in the levels of the main indicators. For example, we found that the indicators were high in the human resources management indicators and medication management indicators, with a little low indicator in information management, medical record indicator, entrepreneurship indicator, and education and training indicators.

Figure 1. Evaluating Basic level of Iraqi hospitals according to JCI



The results of the evaluation were that Al-Madina hospital obtained an evaluation of more than 80% of the total of all basic standards amounting to (13) indicators. This qualifies it to obtain the first rank of accreditation and move to the second phase because it met most of the standards, while the remaining hospitals, especially Ibn Sina Hospital, were very close to obtaining the evaluation, as its evaluation score was (78.24%)

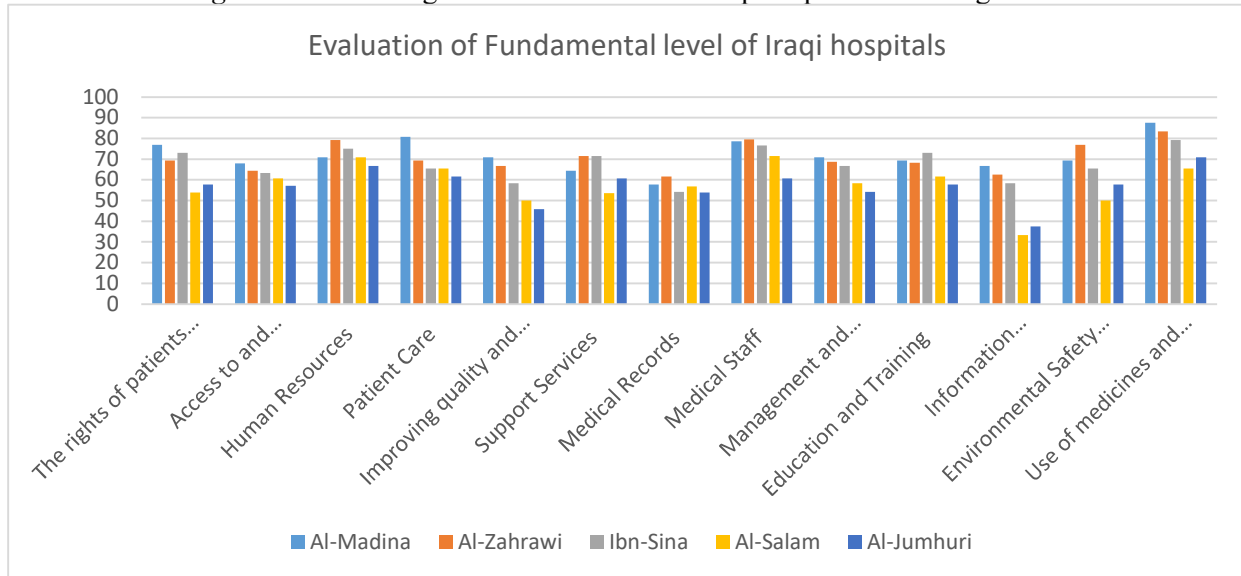
for the Hospital Accreditation conditions. The hospital is entitled to obtain (granting conditional accreditation), And as in Table No. (2).

Table 2 percentage of hospital evaluation at the basic level

Standard	Al-Madina	Al-Zahrawi	Ibn-Sina	Al-Salam	Al-Jumhuri
Rights of patients and their families	82.142	78.571	71.428	67.857	71.428
Access and continuity of healthcare	78.125	70.588	81.25	71.875	65.625
Human Resources	86.66	83.33	80	76.66	71.875
Patient Care	87.5	71.875	75	78.125	71.875
Improving quality and patient safety	76.66	73.33	76.66	66.66	53.33
Support Services	82.142	71.428	78.57	71.428	68.75
Medical Records	76.66	70	76.92	73.33	60
Medical Staff	87.5	84.375	86.66	78.125	68.75
Management and Leadership	73.33	70	73.33	70	63.33
Education and Training	78.571	71.428	76.66	71.428	60.714
Information management	75	76.66	71.875	62.5	59.375
Environmental Safety and Prevention and Control of Infection	70	80	76.66	66.66	70
Use of medicines and pharmacy	92.857	89.285	82.142	78.571	78.571
Basic level	80.551	76.221	78.245	71.788	66.433

Fundamental level: This level requires the hospital to achieve a higher level of quality in services than the basic level. This level usually includes applying a wide range of specific standards and procedures to promote optimal use firmly and strictly and within specific standards and benefiting from investing in the quality of standards to achieve patient satisfaction. Not all of the five hospitals obtained the 80% accreditation level, and their scores ranged between (71%- 57). %, which is the conditional accreditation of hospitals, as in Figure (3).

Figure 3. Evaluating Fundamental level of Iraqi hospitals according to JCI



The evaluation results were below the ideal level, and the quality of health service in Iraqi hospitals deteriorated from what it was in the basic level evaluations. We found that Iraqi hospitals focus on some standards well, such as Human resources standard, Medication management standard, Medical staff standard, and the healthcare standard, and have neglected some standards, such as the information management standard, the medical record standard, and the entrepreneurship standard. As in Table No. (3).

Table 3 percentage of hospital evaluation at the fundamental level

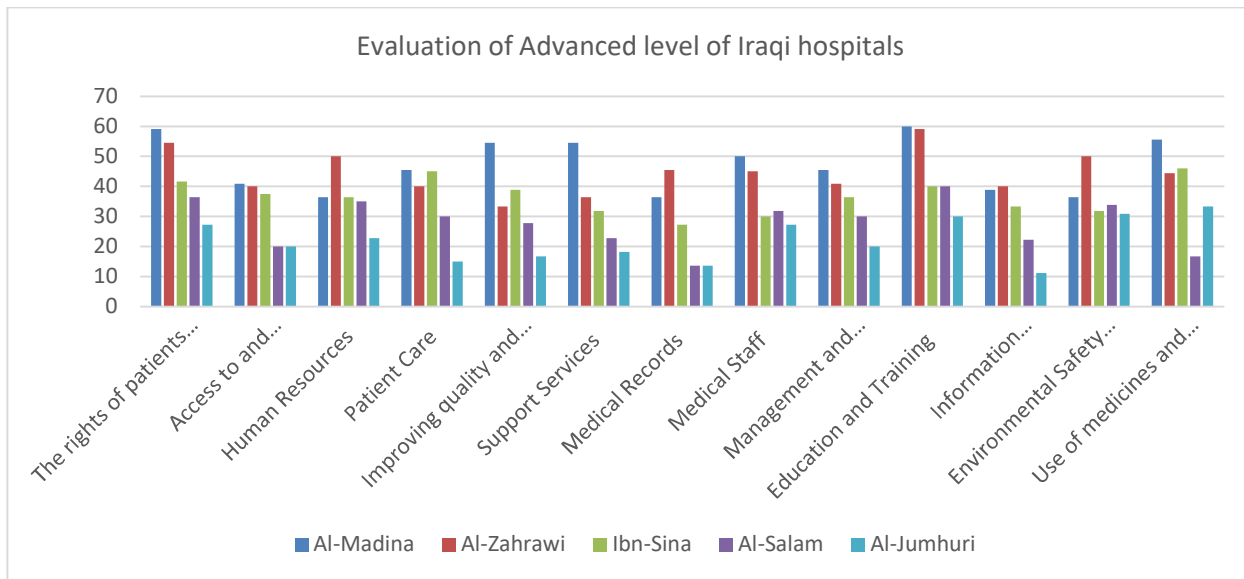
Standard	Al-Madina	Al-Zahrawi	Ibn-Sina	Al-Salam	Al-Jumhuri
Rights of patients and their families	76.92	69.230	73.07	53.846	57.692
Access and continuity of healthcare	67.85	64.285	63.3	60.714	57.142
Human Resources	70.83	79.16	75	70.83	66.66
Patient Care	80.769	69.23	65.38	65.384	61.53
Improving quality and patient safety	70.83	66.6	58.3	50	45.83
Support Services	64.285	71.428	71.42	53.571	60.714
Medical Records	57.692	61.538	54.16	56.846	53.846
Medical Staff	78.571	79.571	76.571	71.428	60.714
Management and Leadership	70.83	68.6	66.6	58.3	54.16
Education and Training	69.230	68.23	73.07	61.538	57.69
Information management	66.66	62.5	58.3	33.33	37.5

Environmental Safety and Prevention and Control of Infection	69.230	76.923	65.38	50	57.692
Use of medicines and pharmacy	87.5	83.3	79.16	65.384	70.833
Fundamental level	71.632	70.828	67.68	57.785	57.079

Advanced level: The evaluation results showed that all Iraqi hospitals do not operate well according to digital standards and do not effectively provide digital services according to all standards (13), and there is no interest in moving towards digital health. We noticed that all five hospitals obtained low rates of less than 50%, and here the hospitals do not qualify for conditional accreditation in the sense of failing to obtain a certificate, as in Figure (4).

It represents the weak use of digital technology or the adoption of digital solutions to improve all aspects of providing health services, from the use of electronic systems and technologies to manage medical information, improve patient experiences, improve the efficiency of health care, and provide remote service to remote areas through a telehealth system. In this way, Iraqi hospitals lose the advantages of it is essential to invest in modern technology in the field of hospital management.

Figure 4. Evaluating Advanced level of Iraqi hospitals according to JCI



Gaps include not applying digital adoption or benefiting from the pillars of digital technology and modern technologies such as digital platforms, electronic payment, telemedicine, digital health, and digital entrepreneurship. They also include not benefiting from modern algorithms such as artificial intelligence, the Internet of Things, deep exploration, and simulation in Treating patients and improving the quality level, which led to a decrease in quality indicators, entrepreneurship indicators, and digital information management indicators in Iraqi hospitals, as in Table (4).

Table 4. *percentage of hospital evaluation at Advanced level*

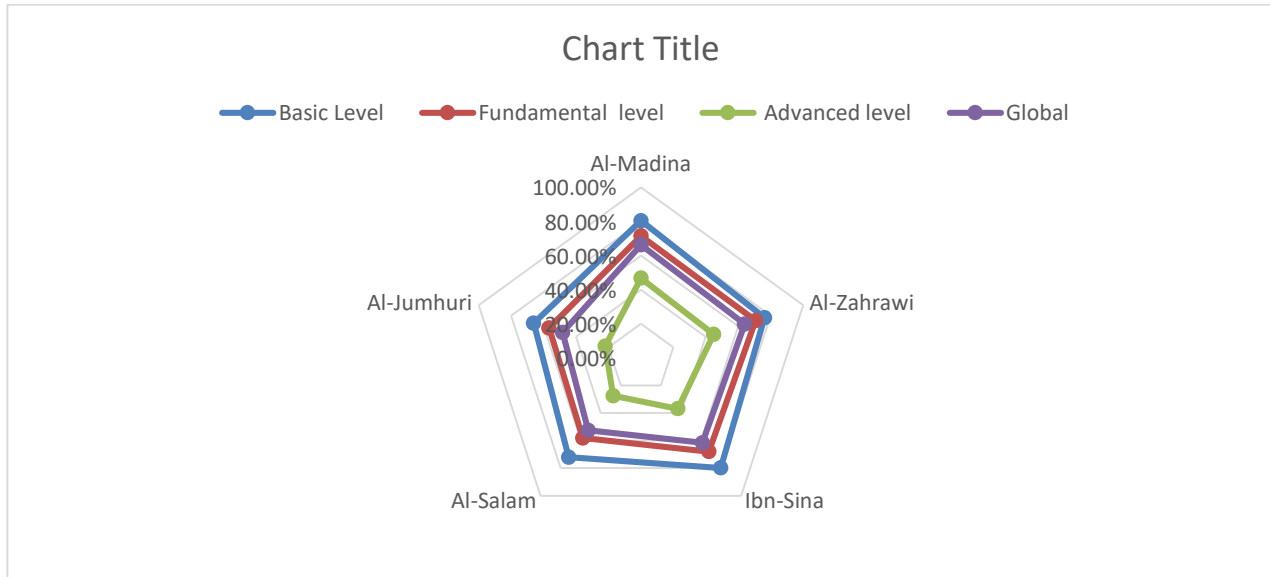
Standard	Al-Madina	Al-Zahrawi	Ibn-Sina	Al-Salam	Al-Jumhuri
Rights of patients and their families	45.45	40	41.66	36.36	27.27
Access and continuity of healthcare	40.90	40	37.5	20	20
Human Resources	36.36	50	36.36	35	22.72
Patient Care	59.09	54.54	45	30	15
Improving quality and patient safety	54.54	33.3	38.88	27.7	16.66
Support Services	54.54	36.36	31.81	22.7	18.181
Medical Records	36.36	45.45	27.27	13.63	13.636
Medical Staff	50	45	30	31.81	27.272
Management and Leadership	45.45	40.90	36.36	30	20
Education and Training	60	59.09	40	40	30
Information management	38.88	40	33.33	22.22	11.11
Environmental Safety and Prevention and Control of Infection	36.36	50	31.18	33.9	30.818
Use of medicines and pharmacy	55.55	44.44	46	16.6	33.33
Advanced level	47.194	44.54	36.617	27.70	22.001

We see a clear difference in the performance of measuring hospitals according to the three levels compared to the one-level global system, as our study reached more accurate results and reads the health reality in Iraqi hospitals in a more simplified and more accurate manner.

Through the study, we find that Al-Madina Hospital, according to the international standard, does not obtain a certificate of accreditation (conditional accreditation). However, we found that Al-Madina Hospital, according to the new three-level scale, provides services at the Basic level in a distinguished manner that deserves an accreditation certificate, and at the Fundamental level, it deserves conditional accreditation and re-evaluation after some time again to obtain the accreditation certificate after focusing on the weak standards. At the Advanced level, there is a significant decline in performance at the technological and technological level and a failure to obtain the accreditation certificate due to the failure to apply modern technology within all Iraqi hospitals.

We also noted the accuracy of the tripartite scale in accurately measuring the quality of Iraqi hospitals for each level, and how it shows progress at the basic level and a significant decline at the advanced level compared to international standards, as in Figure No. (5)

Figure 5. Results evaluation three levels of Iraqi Hospitals



6. CONCLUSION

This research applies a new hospital management system by the latest successful international standards to evaluate Iraqi health institutions in a gradual and simplified manner to accurately measure the level of performance of Iraqi health institutions while reducing the gap between the global health system and the Iraqi health system and the possibility of integration into work in the future due to the compatibility of the systems.

We find that the main criteria (13), determined by (Rights of patients and their families, Access to and continuity of healthcare, Human Resources, Patient Care, Improving quality and patient safety, Support Services, Medical Records, Medical Staff, Management & Leadership, Education & Training, Information management, Control Infection, and Use of medicines and pharmacy), had a differentiated performance at the three levels (basic, fundamental, and advanced), despite the similarity of the nomenclature at the three levels, but our goal was clear, which was to gradually improve the quality of health service in the Iraqi reality and reveal the gaps between service providers. health care for patients and improving the level of well-being to keep pace with global development in the health sector and the extent of the readiness of Iraqi health institutions to keep pace with global development,

This is the evidence that deepens our study, as we find that the five hospitals focus on the basic level very well, follow the recommendations of international standards, support the provision of basic services to patients, and pay attention to taking into account the implementation of basic matters for patients that lead to death or health disability for workers and the basic needs of patients to avoid death.

As for the fundamental level, the results of the evaluation were the implementation of health services, life matters, basic patient needs, amenities, and organizational processes in part, such as the patient appointment management system, the electronic payment system, the modernization of the medical records management system, the laboratory or radiology information management system, as well as the development of an information integration management system with image archives. Any evaluation processes indicate that the

lack of integration of the institutional system in data transfer and sending health data to the main databases creates a gap in the performance of Iraqi hospitals at the fundamental level.

As well as the advanced level, we found that the five hospitals do not provide service at the global health level are unable to obtain health accreditation, and do not invest in modern technology in managing the Iraqi health system, such as digital health, providing remote health care, home care, and artificial intelligence.

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