



# The Impact of Digital Health on Excellence in Health Care Organizations: A Field Study by Application on Baheya Foundation for Early Detection & Treatment of Breast Cancer

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## Abstract

*The research discusses the effect of applying the digital health system on the distinction of organizations and the high quality of health services provided through the case study “Baheya Hospital for Breast Cancer”, where the hospital management system and the system of providing health services to patients has been studied and compared to the quality of health care provided by the patients’ point of view; clarifying as well, the reasons that have led to the distinction of this hospital during the last record time from the time of its establishment until now.*

*The digital health system has been implemented, and accordingly, the quality of health services provided has been raised, which contributes to the distinction of the health institution, Where the data were collected, analyzed, and the results of the study have been extracted; indicating that the hospital’s distinction is indeed for being the first in the ranks of health care providers in Egypt that follow the application of the modern digital health system in hospital management, patient data, and artificial intelligence technology in its equipment and hospital treatment devices. The research ends by a recommendation concerning the importance of selecting this hospital as a model to be emulated in most health care institutions in Egypt; so that, we can achieve one of the goals of sustainable development, namely, raising the efficiency of the quality of health services provided to everyone with no differentiation, reducing as well, the number of deaths resulting from neglect or from cancer and serious other diseases.*

**Keywords:** Digital health - Health Systems Technology - Electronic Health Records - Electronic Patient Portals.

## Introduction

Digital health is a new term referring to a sub-field of medicine by emphasizing the important role of new technology and artificial intelligence devices to facilitate scalable patient care (Timothy et al., 2020), an emerging field of study at the intersection of healthcare and digital technologies, which has attracted lots of attention in the past decade in many countries around the world. In 2019, the American Medical Association reported that companies have invested billions of dollars on new digital health entrepreneurship (O’Reilly, 2020). Digital technology has become an integral part of healthcare, all set to revolutionize the practice of medicine. Digital technology has greatly improved operational efficiency regarding the

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standards of medical care. This transformation greatly has enhanced the holistic experience of both health-care professionals and patients. According to the World Health Organization, digital health or the use of digital technologies in health - has become a prominent area of practice for employing routine and innovative forms of information and communication technology, to meet health needs. Digital technology has also had a tremendous impact on healthcare in some areas, including improving access to medical information and data, as one of the biggest benefits of the digital revolution is the ability to store and access data. It also helps healthcare professionals retrieve patient data from anywhere. It also allows healthcare professionals to quickly share medical information with each other, resulting in more efficient patient care. Another great benefit of digital technology is that it allows clinicians to collect big data in the least amount of time. This data collection allows for accurate analysis and allows healthcare professionals to stay up to date with the latest technology and trends. Also, access to big data allows clinicians to more effectively identify risk factors and recommend appropriate intervention steps.

Hence, this paper tend to shed light on the theoretical framework of digital health and the excellence criteria in the care organization using qualitative analysis. Furthermore, the researcher will use quantitative analysis to identify the relationship between the previous concepts. The paper structure will be as follows, firstly, the digital health concept and its significance is illustrated. Secondly, the excellence criteria and dimensions in healthcare organization are identified. Finally, field study on Baheya hospital had been conducted.

## **The Case Study**

Of course, is that the hospital under study is currently unique of its kind in the community regarding the treatment of breast tumor diseases for women, and by the nature of its distinguished administrative structure and distinguished departments.

## ***Literature Review***

Our hopes and expectations for the future are to see digital health solutions developed as a response to healthcare inequality, climate change, as well as the spread of infectious diseases and other chronic diseases, seeking to achieve the best medically and administratively performance (Senbekov et al., 2020).

This paper reviews and discusses recent attitudes and achievements in the field of digital health by reviewing publications focused on the application of artificial intelligence, "big data" telemedicine, and blockchain technologies, as well as smart devices (internet of things) for solving the real problems in healthcare and medical education (Figure 1). The opportunities and main challenges in these areas are examined and intensively discussed. So far, we have identified more than 252 publications related to the digital health area. Nonetheless, the actual number of papers discussed in the article is limited to 152, due to the exclusions criteria; and also, it is explained that the application of medical digital technologies can provide better access and flexibility to healthcare for the public. It includes the availability of open information on health, treatment, complications, and recent advances in biomedical research. Nowadays, even in low-income countries, diagnostic and medical services are becoming more accessible and available. However, many issues related to digital health technologies remain unmet, including reliability, safety, testing, and ethical aspects.

(Bhavnani et al., 2017) discussed that Healthcare transformation is the product of a shared vision between a broad range of stakeholders to establish the future of care delivery and to develop new patient-centered, evidence-driven models in which value is rewarded over volume. Important within this transformation, are newly developed and rapidly evolving technology-based innovations. These include: digital health with wearable, smartphone, and sensor-based technologies; big data that comprises the aggregation

of large quantities of structured and unstructured health information and sophisticated analyses with artificial intelligence, machine learning, and natural language processing techniques; and precision-health approaches to identify individual-level risk and determinants of wellness and pathogenicity. Although there is promise in the development of such innovations to shift traditional healthcare delivery to virtual and real-time styles and to empower the healthcare enterprise to utilize new technologies and data analytics, there remains a lack of true evaluation of whether these innovations actually improve outcomes and the quality of care.

## **Terminologies of Study:**

### ***The Digital Health Concept and Significance:***

The arena of fitness care varies and could be outstanding and increasing this distinction day by day thanks to virtual fitness generation, which includes many capabilities that assist in offering digital generation in the subject of health. As virtual fitness helps in providing managers of the fitness group with all operational techniques and statistics on all jobs in any respect administrative degrees in the health group, as management in this smart way will cause a fundamental exchange in the degree of the health group and consequently the first-rate of offering care and health carrier, These functions also include providing better and more direct information to everyone about health and disease, providing direct support to health workers and supervisors in diagnosing and treating patients. They will also provide verifiable and searchable records about births, deaths and health meetings (Marc & Lena, 2019).

### ***Definition of Digital Health.***

Different authors agree that digital health includes the use of various healthcare technologies in managing the healthcare offerings, definition of digital health need to consist of the stakeholders involved in healthcare provision and transport tactics. In addition to the definitions of digital health provided by (Kotskov, 2015) and also it is the convergence of digital technologies with health, healthcare, living, and society to enhance the efficiency of healthcare delivery (O' Donoghue et al., 2019), Digital health solutions, particularly, the informational communication technologies, can be used to solve common integrated care problems. These technologies can make care transport approaches more efficient and help the brand of new methods of wondering and action needed to broaden modern fashions, inclusive of included care. Technologies also can enable a fee shift that could have an impact on the behaviors of caregivers operating in incorporated care fashions, making them a potentially effective implementation device (Guldemand, 2021). Digital health not only uses electronic data, it also uses the latest devices that use artificial intelligence and machine learning as primary ways in the domain of digital health to integrate with information, communication technology and other technologies to solve the problems of consumers and patients (Rowlands, 2020). Service lifestyle in healthcare companies is becoming greater privy to the role of culture in improving the nice of carrier supplied to their clients. Buttimer (2008) asserted that health screening scan program enhance if there's non-stop emphasis on provider excellence and the development of a carrier culture.

## **Study Problem**

Throughout the previous mentioned notes, the theoretical literature and the results of previous studies, the study problem can be identified and formulated in the following question:

**“What is the impact of digital health and its strategies in developing resources and achieve excellence in the field of healthcare?”**

## Study Objectives

- 1- Clarify the importance of electronic medical records in saving time and facilitating the access of information to doctors in hospitals.
- 2- Determining digital strategies to raise the level of performance in hospitals.
- 3- Clarify the role of digital health in achieving excellence in health care.
- 4- Emphasizing the importance of paying attention to digital health and developing it in hospitals, as one of the main pillars for achieving excellence.

## Research Hypotheses

- 1- There is no statistically significant relationship between digital health and the reliability criterion.
- 2- There is no statistically significant relationship between digital health and the response criteria.
- 3- There is no statistically significant relationship between digital health and the safety standard.
- 4- There is no statistically significant relationship between digital health on the tangibility standard.
- 5- There is no statistically significant relationship between digital health on the standard of empathy.

## The Importance of Digital Health

Digital health is centrally crucial to accomplishing ordinary fitness coverage with more efficient and powerful modes of presenting nice and equitable access to health for all. But, innovating towards a secure destiny enabled with the aid of digital fitness requires concretely linking investments for virtual fitness to achieving public health goals (World Health Organization, 2019). The adoption of digital technologies in health is crucial for well-functioning health systems and in empowering individuals as part of the transition to integrated, individual-centered care. Digital health also plays an important role in achieving the public health priorities established by the European Union (World Health Organization, 2019). Digital health is a key factor in reforming public health and health systems, improving access, impact and efficiency of health services, providing patient-centered services where individuals participate as active partners in their care, taking advantage of the full potential of digital health in a good way helps services to be safe, reliable, and available to all.

We can say that the transition to digital health has many benefits such as the availability of electronic records. There exist many problems with nowadays paper-primarily based affected person facts which includes the search for something in a patient file, and the warfare to read someone's illegible handwriting from the affected person's document. There has been lots of time lost for the existence of only one copy within the entire medical institution explains the patient's chart, or the navigation thru masses of pages seeking out the solution to an easy query about the affected person is likewise one of the troubles of paper-based totally patient statistics (Ahmed & Samir, 2004). All data is preserved in a computer environment without the need to keep medical and administrative information in a paper environment, archive it and easily access all information upon request; as all the forms used in the hospital (analysis request, general examination, doctor's orders and patients, etc.) are organized and monitored on the system to prepare reports. It helps reduce medical errors by providing accurate and timely information as well as the date of entry and exit of each patient separately. It also works to prevent the waste and unnecessary use of hospital tools or the unlawful leakage of information by monitoring and following up all types of materials used in entering/leaving the hospital. They help achieve the third goal of the sustainable development goals, ensuring that everyone enjoys healthy lifestyles, and develop solutions to reduce premature deaths from cancer and other serious diseases to one third by 2030 (Hayek, 2020).

## The Excellence Criteria and its Impact on Digital Health Care Organizations

Generally, we can define excellence in health care as an approach involved in everyday work practices, as we plan together to understand the needs of sufferers and deliver care inside the excellent useful way. In most cases, the matter is reflected in the way are we dealing with patients, visitors, and others. The fundamental concepts of provider excellence in healthcare include displaying enthusiasm for the carrier we offer and showing the attitude that we love our task and our sufferers for whom we provide care. Therefore, in this section, the researcher will identify the main criteria of healthcare excellence and how can digital healthcare affect the program of excellence of healthcare services.

### *The Healthcare Excellence Criteria:*

Many literatures discussed the different criteria which lead to healthcare excellence such the criteria that describe how patients and customers must be treated to be satisfied.

These criteria can be categorized as follows:

- **Accountability:** Sets clear expectations for every member of the organization and holds them accountable for achieving or not achieving/those expectations. We owe it to every single patient who comes in to have the right people working in the organization. If certain members of the staff are not measuring up, we have to hold them accountable. In addition, the leader of the hospital has to take ownership of the problems.
- **Safety:** It must be the foundation of everything the organization does. We should take our Hippocratic oath very seriously and make sure that while patients are in our care, we do everything to keep them safe.
- **Visibility:** When an organization is undergoing a cultural change, people need to see their leader to believe in him or her. They need to be in front of staff and patients/customers.
- **Accessibility:** This is linked to visibility. Many hospital leaders spend too much time in their offices, while spending insufficient times outside these offices or going around. In our organization, we have a communication board on every patient's wall and my cellular number is on there, anyone can call me. That level of accessibility is important.
- **Collaboration:** Hospitals are like a three-legged stool, with the community and patients as the one leg, the medical staff as the second leg and the employees as the third. If there is no effective collaboration between all three, the stool will fall over. All three parties must work together toward that objective of achieving excellence and shaping the culture of the hospital accordingly.
- **Reliability** means that healthcare services are delivered accurately.
- **Responsiveness** or willingness to help patients.
- **Assurance:** it relates to courtesy and emotional support or building feeling of trust and safeness among patients.
- **Empathy:** could be explained as individualized care, namely, it means that doctors, nurses, and the staff have personalized knowledge of patients.
- **Tangible:** refers to functions of healthcare services.

Parasuraman, Zeithamel & Berry (1985) defined five dimensions for service quality, represented by the Figure (1) (Parasuraman et al, 1985).

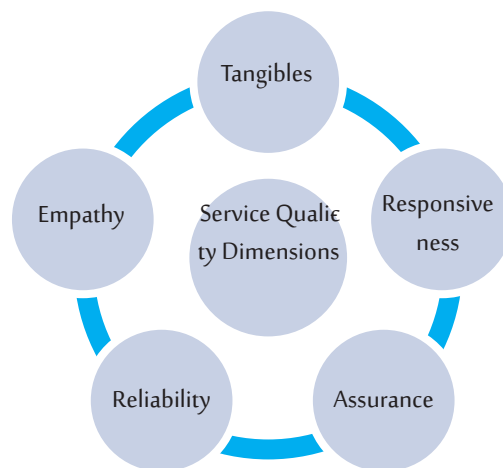


Figure (1) Service Quality Dimensions

## Impact of Digital Healthcare Service to Excellence of Healthcare Service

The first benefit of digital data collection is that we can expect that the quality of the data will be improved. Since data are being entered as part of the delivery of care rather than a separate data collection process, we are likely to see reductions in data entry mistakes. Errors in data will be more apparent to the health worker. There will be fewer opportunities to simply make up data, as overworked health workers try to save time (Bram et al., 2015). Digital health will set the pace for the development and deployment of new medical applications and will change markets around the world. This technology will facilitate increased access to healthcare services (Rinsche, 2017). The current model of healthcare is that the patient must go to a health facility to get any kind of care or even advice, while the next goal will be to fully rely on digital health, which is to provide the care system to the patient himself instead of his actual presence to receive caring. Advances in the use of telemedicine and universal access to information and communications means that people no longer need to visit a clinic but can ask questions and receive advice and treatment recommendations over the phone or other devices (Bashshur et al., 2016). Consequently, the most important mechanism in the digital health system includes the most important and largest goal of this system which is the electronic personal health records. Its most important target is (saving) of a wide variety, saving wasted time in records and paper files, presenting a place that carries most of these papers and paper information, and offering extra people whose undertaking is to keep these big paper documents and update them with a tool that includes all these huge statistics without harm and without occupying area. Thus, the carrier reaches the most important wide variety of patients in need. Moreover, the benefits of making use of the digital health gadget to healthcare excellence are embodied in saving wasted time which consequently leads to the exploitation of this time within the crowning glory of a greater range of every day statements; the ease of follow-up with patients via easy get the right of entry to their facts, and therefore elevating the exceptional of the fitness care carrier provided to sufferers.

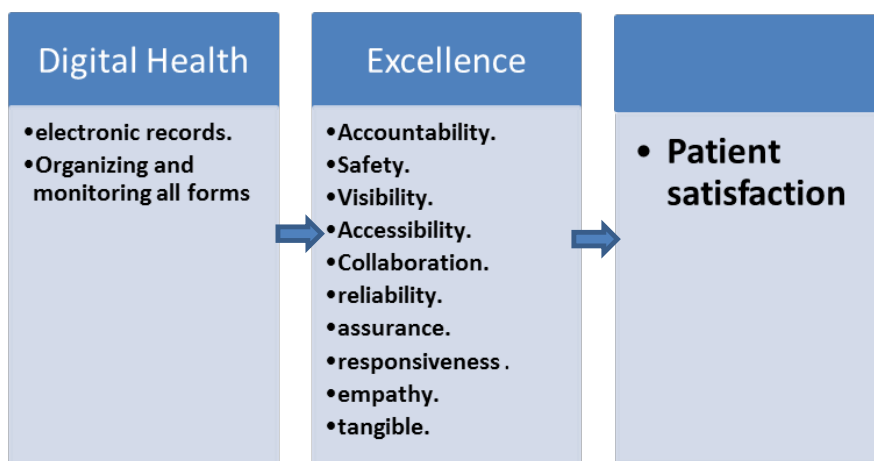


Figure 2 (Clarification Model of the Research)

### Research Methodology

The current research relies on the descriptive and analytical approach to indicate the excellence of the service provided through the adoption of the digital health system and the extent of its importance in the understudy healthcare institution; in addition to analyzing the primary data by testing the research hypotheses.

### Study Variables

From the previous studies, the questionnaire questions prepared for the study, which are compatible with the nature of the research study, were completed. where digital health was the independent variable in this study and excellence in the dependent variable.

## Study Limitations

According to the nature of the social conditions surrounding the community due to Corona virus, there was a difficulty in reaching the statistical sample to a higher level due to the difficulty of communicating with patients and the medical and administrative staff to complete the study questions. There has been another reason, that because the hospital has patients with immune diseases, there was a fear of infection, which made it difficult to enter the hospital most of the time to communicate with the medical, administrative and patient staff to complete the study questions.

## Measurement Instrument

The research has used a questionnaire form prepared by the researcher to examine "impact of digital health on excellence in health care organizations. (A field study by application on Baheya Foundation for Early Detection & Treatment of Breast Cancer)".

## Research Sample

- **Research Population:** The population of the research includes all staff of Baheya Foundation for Early Detection & Treatment of Breast Cancer which reaches up to (518) employees, in addition to a sample of patients who attend the hospital.
- **Sample Size:** Due to the large size of the society, the size of the employee sample to be drawn from a large statistical population, can be determined using Steven Thompson equation as following:

Population (N) = 518

Staff Sample Size = 220.82

0.05    1.96    3.8416

0.0025    0.5

N    Population

z    is the confidence interval, expressed as decimal for P-value    0.95 (1.96)

d    Error Percentage (0.05)    p the ratio of availability & property.

$$n = \frac{N \times p(1-p)}{\left[ \frac{N-1}{d^2} + z^2 \right] + p(1-p)}$$

The online sample size reached 220 respondents.

## The Statistical Approaches

Data were unloaded using the computer through the Statistical Package for Social Sciences Program IBM- SPSS V. 25, working as follows:

- 1- Testing reliability through Cronbach's alpha coefficient to test the reliability of the questionnaire.
- 2- Testing the validity through the Pearson correlation coefficient between dimensions and total questionnaire.
- 3- Descriptive statistics of the data through tabulating data in the form of (numbers, percentage, mean, standard deviation and the weight percentile) for variables questionnaire.
- 4- Pearson correlation coefficient to prove the validity study hypotheses.
- 5- Simple regression to study the impact of independent variables on the dependent variable to prove the validity of the study hypotheses.

## Research Results

### Reliability & Validity:

To check the reliability of the questionnaire, the researcher has used Cronbach's alpha equation (Cronbach Alpha). The following table shows the reliability coefficients generated using this equation.

From the table (1), the reliability coefficients of the Patient's questionnaire & employee's questionnaire were good values where the reliability coefficient values were > (0.5).

The researcher calculated the validity by the correlation coefficient for each dimension of the questionnaires to calculate the validity of the questionnaire dimension. The correlation coefficient values were statistically significant at (0.05) between questionnaire dimension and total questionnaire. Also, the intrinsic validity values were good as shown in table (1) which confirms the validity of the questionnaires.

From the table (2) the greatest numbers were (Employee) & (Doctors) with no. (94) percent (42.7%), while the number of (Management) were (32) with percent (14.6%).

From the table (3) the mean age for (Employees) was (38.4) with standard deviation (8.6), while the mean age for (Patients) was (50.9) with standard deviation (7.4).

Table (4) shows the following:

- The dimension average of (The reliability criterion) was (4.07) indicating response to the (agree) degree, with weight percentile (81.4%).
- The dimension average of (Response criteria) was (3.49) indicating response to the (agree) degree, with weight percentile (69.8%).
- The dimension average of (The safety standard) was (3.96) indicating a response to the (agree) degree, with weight percentile (79.2%).
- The dimension average of (The tangibility standard) was (3.94) indicating a response to the (agree) degree with weight percentile (78.8%).
- The dimension average of (The standard of empathy) was (3.96) indicating a response to the (agree) degree, with weight percentile (79.2%).
- The dimension average of (The digital health) was (3.41) indicating a response to the (agree) degree, with weight percentile (68.2%).

**Table No. (1)**  
**The Reliability & the Validity of Questionnaire Dimensions**

Variables	Patient's questionnaire			Employee's questionnaire		
	Cronbach's Alpha	validity	r	Cronbach's Alpha	validity	r
First: The reliability	0.703	0.838	0.169*	0.555	0.745	0.172*
Second: response criteria	0.826	0.909	0.323**	0.729	0.854	0.508**
Third: the safety standard	0.639	0.799	0.479**	0.660	0.812	0.312**
Fourth: the tangibility standard	0.647	0.804	0.673**	0.644	0.802	0.317**
Fifth: the standard of empathy	0.695	0.834	0.675**	0.642	0.801	0.486**
Sixth: the digital health dimensions	0.698	0.835	0.931**			

\* Statistically significant at (0.05)

\*\* statistically significant at (0.01)

**Table No. (2)**  
**Number and Percent of the Staff's Job**

Variables	No	Percent
Employee	94	42.7
Management	32	14.6
Doctors	94	42.7
Total	220	100.0

**Table No. (3)**  
**Means and Standard Deviations of Age (Patients & Employees)**

Sample	Mean	SD
Employees	38.4	8.6
Patients	50.9	7.4

**Table No. (4)**  
**Means, Standard Deviations and Weight Percentile of Questionnaire's Dimension (Patients)**

Dimension	Mean	SD	Variation coefficient	Weight Percentile	Degree Agree
The reliability criterion	4.07	0.4	0.10	81.4	Agree
Response criteria	3.49	0.7	0.20	69.8	Agree
The safety standard	3.96	0.3	0.07	79.2	Agree
The tangibility standard	3.94	0.6	0.14	78.8	Agree
The standard of empathy	3.96	0.6	0.15	79.2	Agree
The digital health	3.41	0.4	0.13	68.2	Agree



Table (5) shows the following:

- The dimension average of (The reliability criterion) was (4.14) indicating a response to the (agree) degree, with weight percentile (82.8%).
- The dimension average of (Response criteria) was (3.86) indicating a response to the (agree) degree, with weight percentile (77.2%).
- The dimension average of (The safety standard) was (4.09) indicating a response to the degree (agree) with weight percentile (81.8%).
- The dimension average of (The tangibility standard) was (3.68) indicating a response to the (agree) degree, with weight percentile (73.6%).
- The dimension average of (The standard of empathy) was (4.1) indicating a response to the (agree) degree, with weight percentile (82.0%).

From the table (6) there are a significant correlation between the digital health and excellence in healthcare organizations, where Pearson correlation values were significant at P-value (0.01).

### Research Hypotheses:

**H1: There is no statistically significant relationship between digital health and the reliability criterion.**

To study the effect of digital health on the reliability criterion, a test by Simple Linear Regression was conducted and the results were as follows:

- The value of the correlation coefficient (R) concerning the relationship between the management, electronic records, saving time and the reliability criterion was (0.406).
- Regarding the results of the coefficient of determination ( $R^2$ ) of the Simple Linear Regression in the previous table, we find that there is an effect of the digital health on the reliability criterion, by (16.5%).
- The significance test of the regression model according to the value of (F), which is amounted to (19.353) is significant at (0.01) level, confirming the significance of the regression model.
- It is indicated through the test of significance of the regression coefficient (B) model that there is an effect of the digital health and the reliability criterion, relying on the value of (T), which is amounted to (4.399), proving to be significant at (0.01) level.

For the previous results, the H1 was rejected that "There is no statistically significant relationship between digital health and the reliability criterion"; while the hypothesis "There is a statistically significant relationship between digital health and the reliability criterion" was accepted.

**Table No. (5)  
Means, Standard Deviations and Weight Percentile of  
Questionnaire's Dimension (Employee)**

Dimension	Mean	SD	Variation coefficient	Weight Percentile	Degree Agree
The reliability criterion	4.14	0.23	0.06	82.8	Agree
Response criteria	3.86	0.35	0.09	77.2	Agree
The safety standard	4.09	0.35	0.09	81.8	Agree
The tangibility standard	3.68	0.39	0.11	73.6	Agree
The standard of empathy	4.1	0.29	0.07	82.0	Agree

**Table No. (6)  
The Correlation Matrix between Digital Health  
and Excellence in Health Care Organizations**

Variables	The Digital Health	
	r	P-value
The reliability criterion	0.406 <sup>(**)</sup>	0.001
Response criteria	0.267 <sup>(**)</sup>	0.001
The safety standard	0.442 <sup>(**)</sup>	0.001
The tangibility standard	0.552 <sup>(**)</sup>	0.001
The standard of empathy	0.533 <sup>(**)</sup>	0.001
Total excellence in health care	0.359 <sup>(**)</sup>	0.001

**Table No. (7)  
The Simple Linear Regression Test to Study the Effect of Digital  
Health on the Reliability Criterion**

Variables	R	R <sup>2</sup>	B	F	t	p-values
Effect of digital health on the reliability criterion	0.406	0.165	0.356	19.353	4.399	0.001

**H2: There is no statistically significant relationship between digital health on the response criteria.**

This hypothesis examines the effect of digital health on the response criteria that is tested by the Simple Linear Regression Test.

The results were as follows:

- The value of the correlation coefficient (R) to clarify the relationship between the management, electronic records, saving time and the response criteria was (0.267).
- Given the results in the previous table of the coefficient of determination ( $R^2$ ) of the Simple Linear Regression, we find that there is an effect of the digital health on the response criteria by (7.1%).
- The significance test of regression model based on the value of (F), amounted to (7.507) is significant at (0.01) level, which confirms the significance of the regression model.
- It is shown through the significant regression coefficient test (B) model, that there is an effect of the digital health and the response criteria, relying on the (T) value and amounted to (2.740) which proves to be significant at level (0.01).

From the previous results, H2 is rejected as “There is no statistically significant relationship between digital health and the reliability criterion”; while the hypothesis indicating that “There is a statistically significant relationship between digital health and the response criteria” is accepted.

**Table No. (8)  
The Simple Linear Regression Test Studies the eEffect of Digital Health on the Response Criteria**

Variables	R	R <sup>2</sup>	B	F	t	p-values
Effect of digital health on the response criteria	0.267	0.071	0.425	7.507	2.74	0.007

**H3: There is no statistically significant relationship between digital health and the safety standard.**

Studying the effect of digital health on the safety standard was tested by the Simple Linear Regression and the results were as follows:

- The value of the correlation coefficient (R) refers to the correlation between the digital health and the safety standard by (0.442).
- Regarding the results of the coefficient of determination ( $R^2$ ) of the simple linear regression in the previous table, we find that there is an effect of the digital health on the safety standard by (19.5%).
- The test significant model regression based on the value of (F), which amounted to (23.784) which is significant at level (0.01), confirming the significant regression model.
- It is indicated through the significant regression coefficient test (B) model, which explains an effect exists between the digital health and the safety standard, relying on the value of (T), which amounted to (4.877) and proved to be significant at level (0.01).

From the previous results, H3 is rejected “There is no statistically significant relationship between digital health and the reliability criterion” and the hypothesis that “There is a statistically significant relationship between digital health and the safety standard” is accepted.

**Table No. (9)  
the Simple Linear Regression Test to Study the Effect of Digital Health on the Safety Standard**

Variables	R	R <sup>2</sup>	B	F	t	p-values
Effect of digital health on the safety standard	0.442	0.195	0.275	23.784	4.877	0.000

**H4: There is no statistically significant relationship between digital health on the tangibility standard.**

Studying the effect of digital health on the tangibility standard was tested by the Simple Linear Regression and the results were as follows:

- The value of the correlation coefficient (R) is used to indicate the relationship between the digital health and the tangibility standard was (0.552).
- Given the results of the coefficient of determination ( $R^2$ ) of the simple linear regression test in the previous table, we find that there is an effect of the digital health on the tangibility standard (19.5%).
- Testing the significance of the regression model, based on the value of (F), which amounted to (42.907) and significant at level (0.01), confirms the significance of the regression model.
- It is indicated through the significant model regression coefficient test (B), which shows that there is an effect of the digital health and the tangibility standard, relying on the value of (T), which amounted to (6.550), being significant at level (0.01).

**Table No. (10)**  
**the Simple Linear Regression Analysis is Used to Study the Effect of Digital Health on the Tangibility Standard**

Variables	R	$R^2$	B	F	t	p-values
Effect of digital health on the tangibility standard	0.552	0.305	0.703	42.907	6.550	0.000

From the previous results, H4 is rejected that "There is no statistically significant relationship between digital health and the reliability criterion" and the hypothesis that "There is a statistically significant relationship between digital health and the tangibility standard" is accepted.

**H5: There is no statistically significant relationship between digital health and the standard of empathy.**

To study the effect of digital health on the standard of empathy, that is tested by the simple linear regression test, where the results come as follows:

- The value of the correlation coefficient (R) proves the relation between the digital health and the standard of empathy, representing (0.533).
- According to the results of the coefficient of determination ( $R^2$ ) of the simple linear regression in the previous table, we find that there is an effect of the digital health on the standard of empathy by (19.5%).
- The test significance of the regression model based on the (F) value, amounted to (38.888) is significant at level (0.01), which confirms the significance of the regression model.
- It is indicated through the significant regression model that (B) coefficient value which explains the presence of the effect of the digital health and the standard of empathy and rely on the value of (T), being amounted to (6.236) as significant at level (0.01).

**Table No. (11)**  
**The Simple Linear Regression Test for Examining the Effect of Digital Health on the Standard of Empathy**

Variables	R	$R^2$	B	F	t	p-values
Effect of digital health on the standard of empathy	0.533	0.284	0.694	38.888	6.236	0.000

From the previous results, H5 is rejected that "There is no statistically significant relationship between digital health and the reliability criterion"; while the hypothesis "There is a statistically significant relationship between digital health and the standard of empathy" is accepted.

## The General Results

- 1- There is a statistically significant relationship between digital health and the reliability criterion.
- 2- There is a statistically significant relationship between digital health and the response criteria.
- 3- There is a statistically significant relationship between digital health and the safety standard.
- 4- There is a statistically significant relationship between digital health on the tangibility standard.
- 5- There is a statistically significant relationship between digital health on the standard of empathy.

## **The Conclusion**

First of all, it can be concluded that service quality as perceived by customers is as a result of how well service matches expectations. Secondly, that service quality is determined by two dimensions, namely; expectations and experience and each of these dimensions has underlying factors. Thirdly, five factors determine the outcome of service quality which are used by the customers to complete judgement during service delivery, namely; tangibles, reliability, responsiveness, assurance and empathy. According to Ho, (2009), the customer-focused management paradigm quality is viewed as one component of the value created for the customer. It is managed into the process of making the product or service and is seen as synergistic with cost and delivery. Service quality is viewed as something that encompasses the entire organization. Since all functions are responsible for product quality and all share the cost of poor quality, quality is viewed as a concept that affects the entire organization (Ho & S. K. M, 2009).

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