The Impact of Modern Technology in Limiting the Spread of Epidemics in Health Facilities in Najran

By

Ali Abu Hasirah, Mohammed Owaydhah Almansour

Hamad Fahad Almansour

Salih Ali Alqashanin

Hussain Fahad Alyami

Majid Abdullah Alqashanin

Ayed Hassan Almurdif

Murdi Fahad Alyami

Mohammed Almurdif

Abstract:

The study aimed to identify the impact of Modern Technology in Limiting the Spread of Epidemics in Health Facilities in Najran. This study relied on the descriptive research approach and the field approach, where the researcher conducted a desk survey and explored previous theoretical and field trends related to the content of the study, its variables, dimensions, and building the theoretical framework for it. A questionnaire used a tool that was applied to (250) individuals of administrative workers in Health Facilities in Najran .The study results showed that there is a high degree of appreciation for Information Technology in Health Facilities in Najran. The study showed that Modern Electronic Programs was in the first rank, while in the second rank came after Application of Health Information Systems, and in the third rank was the Intranet, where those dimensions were at a high level of appreciation. In the fourth and final rank came after the Internet at moderate level of appreciation. The study also found a significant relationship between information technology (Internet, Intranet, modern electronic programs, application of health information systems) and Spread of Epidemics in government hospitals in the Najran region .In light of the results, the study recommended to limiting the spread of epidemics in health facilities in Najran.

Keywords: Modern Technology Spread of Epidemics, Health Facilities in Najran.

Introduction:

Since ancient times, man has faced health challenges and been exposed to various diseases as a result of the environment in which he lives and his frequent movement in order to survive, and even with the development and stability of societies, new types and forms of diseases and epidemics have appeared that destroy human lives and affect their lives in general in all respects, the last of which was the Corona virus.

For many years, the risk of emerging infectious diseases with pandemic potential was declared a major threat to global health security. However, there are many organizations that consider and deal with such incidents around the world; i.e. World Health Organization, Global Health Security Initiative have been very active recently in the bio field (De Bruin et al., 2020).

The types of epidemics have evolved and changed in terms of structure and impact on humans and the extent and speed of their spread, especially in crowded public places and health institutions, where the spread of the epidemic within the health institution has become a challenge for administrative and medical employees (Musa et al., 2013).

Therefore, modern strategies and tools must be developed to deal with these epidemics, limit their spread and predict them before they occur. Thus, it has become important to exploit the development and technological progress and introduce modern technology to health institutions, in order to limit the spread of the epidemic in them and preserve the health and life of patients and workers within the institution (Zaman et al., 2020).

Modern technology can be applied in health institutions through many different ways, but the basis for using technology is to collect the necessary information in the least effort and the fastest time, as information and data play an important role in evaluating the situation of the epidemic and patients and help in dealing with it (Dash et al., 2019).

Rubinelli et al. (2020) indicated that persons who providing care and support in the pandemic are experiencing overwhelming stress, difficulties managing uncertainty, and concern for their own health and the health of their families. Thus, all of these factors impact communication in

healthcare, and therefore resources for managing these issues are of vital importance.

The use of technology has saved many sectors such as education and health, as technology companies provide digital tools to overcome social isolation, enhance social cohesion, and raise awareness about health and safety guidelines to tackle the pandemic .Using technology can make a significant contribution to the immediate and short-term response to a pandemic and to long-term resilience (Aljawhri, 2020).

According to Yamamoto et al. (2021), digital technologies divided into four groups: Internet of Things (IoT), big data analytics, artificial intelligence (AI), and block-chain technology. However, these groups have different types and uses that can be useful in healthcare institution in dealing with epidemics and improve health services.

Aim of study:

The study aims to identify the Impact of Modern Technology in Limiting the Spread of Epidemics in Health Facilities in Najran.

Objectives:

The study aims to achieve the following objectives:

1. Statement of the extent of using modern information technology (Internet, Intranet, modern electronic programs, application of health information systems) in Health Facilities in Najran.
2. Measuring the efficiency of dealing with and reducing epidemics in Health Facilities in Najran.
3. Analysis of the Impact of Modern Technology in Limiting the Spread of Epidemics in Health Facilities in Najran.

Study Hypotheses:

Main Hypothesis

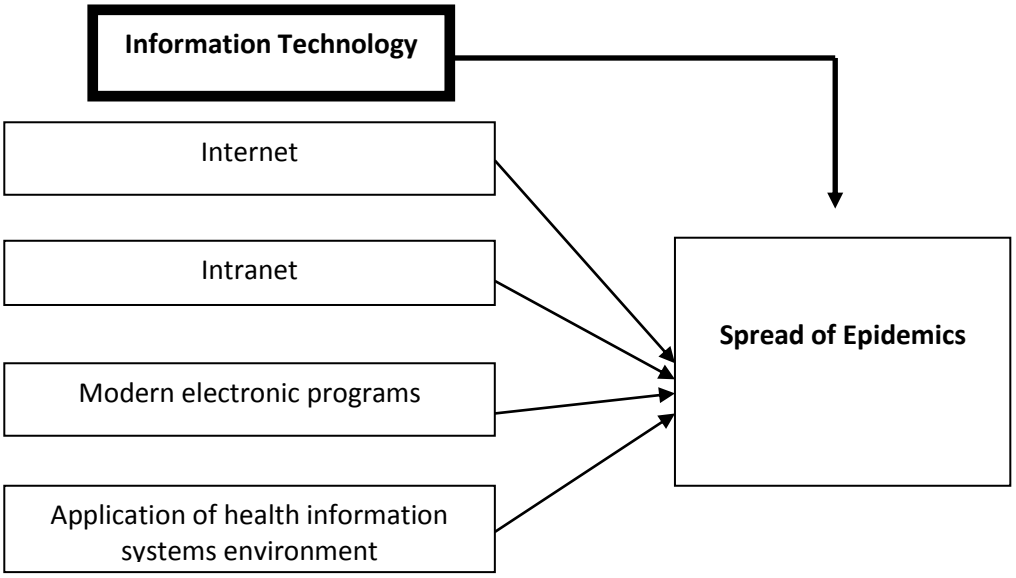
H0: There is a significant relationship between information technology (Internet, Intranet, modern electronic programs, application of

health information systems) and Spread of Epidemics in government hospitals in the Najran region.

Sub Hypothesis:

1) H01: There is a significant relationship between Internet and Spread of Epidemics in government hospitals in the Najran region.
2) H02: There is a significant relationship between Intranet and Spread of Epidemics in government hospitals in the Najran region.
3) H03: There is a significant relationship between modern electronic programs and Spread of Epidemics in government hospitals in the Najran region.
4) H04: There is a significant relationship between application of health information systems and Spread of Epidemics in government hospitals in the Najran region.

Study Model:



Source: prepared by the researcher based on previous studies

Literature Review:

Concept of Technology

The term of "Technology" appeared for the first time in English literature in the 17th century to mean a discussion of the applied arts only. By the early 20th, the term developed to indicate to a growing range of means, processes, and ideas in addition to tools and machines. Then the concept of technology was defined as the means or activity by which man seeks to change or manipulate his environment by mid-century (Buchanan, 2022).

By the end of the 20th century, technology is becoming more and more prevalent in every essential field in our life such as education and health. In addition, the concept of technology rapidly developed through making massive strides in software development, computer programs and online tools…etc. (Strom, 2021).

Nowadays, the Fourth Industrial Revolution have led to a rapid increase in business opportunities that led to technological changes. Thus, the number of institutions and organizations that focusing on technology development for competitive survival and further growth has increased (Kimura et al., 2021).

However, the development of the technological tools and devices like television and robots and so on formed the definition of the modern technology as "a system created by humans that uses knowledge and organization to produce objects and techniques for the attainment of specific goals" (Carroll, 2017).

The definition of technology includes processes, systems, management, mechanisms for human and inhuman control. In simple words, technology refers to arguable or logical application of knowledge (Ahmadigol, 2016).

According to Luppicini (2005), the concept of technology refers to the organization of knowledge for the achievement of practical purposes as well as any tool or technique of doing or making, by which capability is extended.

On the other hand, there are various definitions and concepts of technology, that is its dynamic nature of technology that consists of two primary components: 1) a physical component which comprises of items such as products, tooling, equipment, blueprints, techniques, and processes; and 2) the informational component which consists of know-how in management, marketing, production, quality control, reliability, skilled labor and functional areas (Abdul Wahab et al., 2012).

Importance of Technology

By the importance of the need for knowledge in the formation and development of organizational culture, so it is important to support the notion that it is appropriate to analyses the technological dimension as it may be critical in the formula of sustainable business (Drejeris and Oželienė, 2019).

In order to improve their processes; organizations have to adopt new strategies that based on modern technologies. Accordingly, the survival and development of the organizations depend on knowledge applications and technological innovation. Thus, technology is an essential factor in improving organizations (Gheitarani et al., 2022).

In addition, the importance of technology in organizations represents in covering all fields and aspects of life and any organization in any sector can use and take advantage of using technologies in its processes and functions, which improves its activities and the relationship between the employees and the clients. Using technology facilitates the communication among the organization's employees (Cardoso and Gomes, 2011).

Rice and Leonardi (2014) indicated that using technologies in operational systems in the organization affects its administrative structure and causes a certain outcomes such as the centralization of its decision-making.

Using well-designed technology that require the streamlining of the flow of information, work, material, and patients and good decision making models result in improved safety, efficiency and reduced costs and medical errors (Gupta and Sharda, 2013).

On the other hand, the use of technology facilitates actual human resource functions: human resource planning; recruitment and selection; performance management; reward management; Health and safety; employee relations; Work design, and added new requirements to the human resource function to ensure that the organization's human capital is in line with the strategic needs of the digital age (Fenech et al., 2019).

As well as, technologies support managers in identifying the different patterns of formulating the organization's vision, mitigating its problems, and dealing with the challenges it faces, as based decision-making enhances objective and calculable criteria and reduces the importance of subjective and non-calculable criteria (Dietzmann and Duan, 2022).

Using Technologies in Healthcare

Technologies has reached the healthcare sector, with many examples including a system that integrates patient data systems and cyber-security measures for networked medical devices. Healthcare has witnessed great benefits with the adoption of new technologies that help provide safe and high-quality patient care and increase business efficiency. There are many digital services that have been integrated into the end-to-end IT systems of many healthcare organizations such as electronic health records, digital imaging, electronic prescription services (Haggerty, 2017).

The technologies used in healthcare organizations developed from digital technologies that used interactively during the application process. There are two types of technologies that used in healthcare organizations: 1) data and information technologies; 2) tools and devices, Wang et al. (2021) identified the key data technologies used in healthcare as the following:

Internet of Things (IoT): refers to the interconnection of all ordinary objects that can perform independent functions through various information sensing devices. IoT can help hospitals realize intelligent management, collect and share data such as drugs and medical information. The drug identification system of the IoT can reduce human-induced medication

errors and improve the work efficiency of medical staff and it can reduce medical costs.

Artificial Intelligence (AI): can simulate human decision-making and reasoning processes, and supplement and enhance human intelligence through continuous machine learning, and it can automatically learn from massive data to obtain knowledge, and make accurate predictions based on the results of data learning. AI can provide medical staff with auxiliary diagnosis and auxiliary treatment, reducing the workload of medical staff, which improves the work efficiency and medical service level of medical staff. It involves computer science, mathematics, cognitive science, neurophysiology, information theory and other fields.

Blockchain: is essentially a decentralized database technology. Blockchain has the characteristics of decentralization, openness, anonymity, and non-tamper ability, and it is widely used in electronic medical record management, drug and drug supply chain management, health data analysis, etc.

Cloud Computing: is a disruptive technology, which has developed into a hot technology and it is a computing resource delivery model and a type of distributed computing technology, its structure divided into four layers: data center, infrastructure, platform and application. Cloud computing technology integrates various servers, applications, data and other resources, and provides these resources in the form of services through the network, making computing resources virtual.

Big Data: it has five basic characteristics: huge data volume (Volume), diverse data types (Variety), fast processing speed (Velocity), low value density (Value) and high data authenticity (Veracity). Big Data refers to computer technology that quickly obtains valuable information from various types of data, also it refers to a collection of data whose content cannot be captured, managed, and processed with conventional software tools within a certain period of time.

Information technologies in healthcare include various technologies that span from simple charting, to more advanced decision support and integration with medical technology and they present numerous

opportunities for improving and transforming healthcare which includes; reducing human errors, improving clinical outcomes, facilitating care coordination, improving practice efficiencies, and tracking data over time (Alotaibi and Federico, 2017).

Andreu-Perez et al. (2015) indicated that big data in health sector and institutions is focused on meaningful datasets that are too big, too fast, and too complex that healthcare providers can't process and interpret with existing tools.

However, the technological devices and tools that used in healthcare are mostly wearable and mobile devices that allow the healthcare provider to have a full observe on the health status and information of his patents without need to visit the hospital, as well as the technological equipment that used in diagnosis process. Ding et al. (2021) highlight some of the most used wearable tools in healthcare as: oxygen saturation and respiratory rate; blood glucose monitors; smart watch and belt, blood pressure monitoring, cough monitoring.

In addition, technologies in healthcare help improve and promote health by assisting patients to detect, diagnose, prevent, monitor and treat diseases, manage our lifestyle and improve our wellness and quality of life. Such technologies include health portals and electronic health records, telemedicine services, Tele-ICU services and health information networks (Ortega-Navas, 2017).

Thus, it can be noted that using technologies in the healthcare institutions reflects the importance and various benefits, as it includes and is involved in all levels and fields within the institution, as well as the existence of a special system for each branch within the health institution, in addition to the development of various technologies and applications that facilitate the management of operations and the provision of services.

Dealing with Epidemics

Over decades human are facing and dealing with changing and developing diseases and viruses. Such diseases developed and spread widely to become an out of control pandemics that rapidly infect human. The most

essential causes of such pandemics are wars, environmental and natural factors and actions, negative human behavior and pollution (Cipriano, 2018).

Controlling of epidemics and pandemics is an essential challenge to health systems, because the nature of the infectious of such diseases that can be transmitted rapidly to others and thus require a focus on early detection and treatment, surveillance, and outbreak control (Tilahun et al., 2021).

Pandemics produced significant impacts on people, businesses, and society also they has implications for the design, development, and use of technologies, but using technologies in health sector can be useful for reducing the severity of the pandemic's impact on people, organizations, and society (Elavarasan et al., 2021).

Health technological tools are very beneficial in a life-threatening situation like a pandemic, because they provide accurate and timely diagnosis that help to make decisions. Thus, the result of diagnosis affects the decision, so a wrong diagnosis can result in wrong or delayed medication, undue stress, financial costs, and risk of life. There are quantifiable aspects of diagnosis which can be improved with the help of smart technological intervention (Kumar et al., 2021).

However, using technological tools provide effective support for institutions during a pandemic and improving healthcare, such as time savings and improved monitoring (Negreiro, 2021).

Using technologies in health care systems helping in reducing infections due to responsibilities by doctor, heart attack due to clot of air embolism in intravenous fluid (IF), medication errors in surgery. Furthermore, using intelligent devices to smart hospitals enhance medical experiences of patients and reduce the labor intensity of medical staff (Kumar et al., 2020).

Information and communication technologies help support effective outbreak surveillance and control strategies, including but not limited to, contact tracing, social mobilization, mapping, communication, monitoring, and response, such technologies assist national and international efforts to control the spread of the disease by playing a critical role in raising

awareness about the pandemic, prevent the spread of the disease, and support the role of frontline healthcare workers by providing better means to communicate simple, trustful and reliable instructions and information (Tambo et al., 2017).

According to Lee and Lee (2021), telemedicine and technologies in healthcare which has been widely practiced since 1990s as a part of contactless healthcare service. However, during and after the last pandemic COVID-19, contactless healthcare services in the digital age encompass far beyond the traditional scope of telemedicine, thus digital technology enabled contactless healthcare services have also made a big stride in their developments during the pandemic.

On the other hand, using technologies to combat the pandemic raises challenges such as security, privacy, biases, ethics, and the digital divide, and operate such technologies requires significant financial and human resources (He et al., 2021).

Therefore, it is suggested that decision-makers and senior management in health institutions need an interactive system that meets their needs for providing information, as well as introducing new variables or making changes in assumptions related to the problem, and presenting a set of scenarios that help decision-makers choose the best solutions within appropriate time and less effort without referring to specialists in information analysis.

Previous studies:

Ding et al. (2021): Wearable Sensing and Telehealth Technology with Potential Applications in the Coronavirus Pandemic

The study aimed to review enabling technologies and systems with various application scenarios for handling the COVID-19 crisis. The article will focus specifically on 1) wearable devices suitable for monitoring the populations at risk and those in quarantine, both for evaluating the health status of caregivers and management personnel, and for facilitating triage processes for admission to hospitals; 2) unobtrusive sensing systems for detecting the disease and for monitoring patients with relatively mild symptoms whose clinical situation could suddenly worsen in improvised

hospitals; and 3) telehealth technologies for the remote monitoring and diagnosis of COVID-19 and related diseases. The results indicated that with successful implementation and deployment of these emerging technologies during the evolving pandemic, the burden on healthcare systems can be reduced by shifting service and care from hospital to improvised hospital and home; the clinical outcome can be improved through timely intervention by identifying any deterioration and exacerbation at an early time; the diagnosis and treatment can be rapid with screening of suspected and asymptomatic/presymptomatic cases; and the contacts between medical staff and patients can be minimized by remote monitoring and care. Further, the physicians and healthcare staff are increasingly adapting to using these technologies, recognizing their potential for scaling up current healthcare provision. The study suggested to develop more sophisticated multi-parameter flexible and stretchable sensing based wearable devices and health platforms with robust functionality but at an affordable cost, allowing application in a wider range of both clinical and public contexts; and to develop automated AI-based decision support systems that integrate and view multiple real-time, near real-time datasets and electronic health records simultaneously to assist providers with timely and efficient detection of anomalies and exacerbations.

Wang et al. (2021): Integrating Digital Technologies and Public Health to Fight Covid-19 Pandemic: Key Technologies, Applications, Challenges and Outlook of Digital Healthcare

The study covers the background information and research overview of digital healthcare, summarizes its applications and challenges in the COVID-19 pandemic. The data collected and analyzed of three regions China, EU and USA that using digital technologies to fight the COVID-19 pandemic. The results showed that technologies play an irreplaceable role in controlling the spread of the COVID-19. By comparing the application cases in these three regions, we contend that the key to China's success in avoiding the second wave of COVID-19 pandemic is to integrate digital technologies and public health on a large scale without hesitation, as well as challenges mainly come from four aspects: data delays, data fragmentation,

privacy security, and data security vulnerabilities. Finally, this study provides the future application prospects of digital healthcare.

Tilahun et al. (2021): Mapping the Role of Digital Health Technologies in Prevention and Control of COVID-19 Pandemic: Review of the Literature

The study aimed to explore the role of digital health technologies in the fight against the COVID-19 pandemic and address the gaps in the use of these technologies for tackling the pandemic. The study conducted and reviewed studies that focused on the application of digital health technologies on COVID-19 prevention and control. The results showed that telemedicine was used most frequently, followed by electronic health records and other digital technologies such as artificial intelligence, big data, and the internet of things (IoT). As well as, digital health technologies were used in multiple ways in response to the COVID-19 pandemic, including screening and management of patients, methods to minimize exposure, modelling of disease spread, and supporting overworked providers. The study recommended that it is necessary to deploy and use of digital health tools in response to a pandemic for more effective deployment of digital health tools in times of pandemics, development of a guiding policy and standard on the development.

Sharif et al. (2021): Contributions of Smart City Solutions and Technologies to Resilience against the COVID-19 Pandemic: A Literature Review

The study aimed to examine how smart city solutions and technologies have contributed to resilience by enhancing planning, absorption, recovery, and adaptation abilities. The study reviewed (147) studies that have discussed issues related to the use of smart solutions and technologies during the pandemic. The results showed that investment in smart city initiatives can enhance the planning and preparation ability. In addition, the adoption of smart solutions and technologies can, among other things, enhance the capacity of cities to predict pandemic patterns, facilitate an integrated and timely response, minimize or postpone transmission of the virus, provide support to overstretched sectors, minimize supply chain

disruption, ensure continuity of basic services, and offer solutions for optimizing city operations. The study recommended that it should be noted that realizing this potential hinges on careful attention to important issues and challenges related to privacy and security, access to open-source data, technological affordance, legal barriers, technological feasibility, and citizen engagement. Despite this, this review shows that further development of smart city initiatives can provide unprecedented opportunities for enhancing resilience to the pandemic and similar future events.

Golinelli et al. (2020): How the COVID-19 pandemic is favoring the adoption of digital technologies in healthcare: a literature review

The study aimed to describe which digital solutions have been reported in the scientific literature and to investigate their potential impact in the fight against the COVID-19 pandemic. The study conducted a literature review of (269) articles. The study found that digital solutions and innovative technologies have mainly been proposed for the diagnosis of COVID-19. Digital technologies are useful also for prevention and surveillance measures, for example through contact-tracing apps or monitoring of internet searches and social media usage. The study recommended that it is worth taking advantage of the push given by the crisis, and mandatory to keep track of the digital solutions proposed today to implement tomorrow's best practices and models of care, and to be ready for any new moments of emergency.

Methodology:

This study relies on the descriptive research approach and the field approach, where the researcher will conduct a desk survey and explore previous theoretical and field trends related to the content of the study, its variables, dimensions, and building the theoretical framework for it.

The analytical approach will be used to measure The Impact of Modern Technology in Limiting the Spread of Epidemics in Health Facilities in Najran.

Population and Sample:

The study population includes all administrative workers in Health Facilities in Najran, where the study tool was distributed to (250) individuals of the study sample.

A total of 250 questionnaires were distributed electronically 246 were collected 3 questionnaires have been neglected due to uncompleted answers, 243 questionnaires data were suitable to be tested.

Description the study sample Personal Information:

The frequencies and percentages of the study sample personal information were found as follows:

Table (1) Sample's personal information

The information		Frequency	Percent %
Gender	Male	125	51.4
	Female	118	48.6
	Total	**243**	**100.0**
Age	Less than 30 years	27	11.1
	30-less than 40 years	138	56.8
	40-less than 50 years	74	30.5
	50 years and above	4	1.6
	Total	**243**	**100.0**
Educational level	Bachelor degree	35	14.4
	Master degree	123	50.6
	PhD degree	85	35.0
	Total	**243**	**100.0**
Work Experience	Less than 5 years	32	13.2
	5-less than 10 years	90	37.0
	10- less than 15 years	121	49.8
	Total	**243**	**100.0**

Source: prepared by the researcher based on the field study

Table (1) shows that most of the study sample members were male (51.4%), while female represented (48.6%) of the study sample in Health Facilities in Najran.

However, table (1) indicates that most of the study samples (56.8%) have (30-less than 40 years old), (30.5%) of the study samples have (40-less than 50 years old), (11.1%) of the study samples have (less than 30 years old), while (1.6%) of the study samples have (50 years old and above).

Table (1) also shows that (50.6%) hold master degree, (35%) of the samples hold PhD degree, while (14.4%) hold Bachelor degree of the study sample in Health Facilities in Najran.

In addition, table (1) Shows that (49.8%) of the samples in Health Facilities in Najran have (10-less than 15 years) work experience, (37%) of the samples have (5- less than 10 years) of work experience, while (13.2%) of the study sample have (less than 5 years)) of work experience.

Reliability Test:

The Reliability Test, which is the calculation of the Cronbach-Alpha coefficient, will be tested to verify the internal consistency of the fields included in the questionnaire as a measuring tool, where a value ranges between (1-0) and its value is acceptable at (%60) and above (Sekaran & Bougie, 2014). Table (2) shows the test results as follows:

Table (2) Reliability Test

Variable	Paragraphs No.	Cronbach's Alpha
Information Technology	24	93.1%
Reducing Epidemics In Health Facilities In Najran	6	84.9%
Total	30	94.2%

Source: prepared by the researcher based on the field study

Table (2) indicates a high reliability of all study variables and the total in general, as the value of (Cronbach-Alpha) was more than the value (60%) for each variable and for all variables of the study scale.

Statistical tools:

Depending on the SPSS program, the following tests are performed:

Descriptive Statistics:

1. Percentages and frequencies to describe characteristics of study sample (Gender, Age Educational Level, Work Experience)

2. Arithmetic mean and standard deviation to achieve the first and the second objectives.

Analytical Statistics:

3. Multi regression test to achieve the third question.

Ethical consideration:

The following ethical rules will be applied:

1. Hospital approval will be obtained to conduct the study there.
2. The data will be used for research purposes only and participants will be informed accordingly.
3. Participants are free to participate or withdraw at any time (The introduction to the questionnaire will include a statement indicating that the participant can withdraw at any time)
4. The name of the participant will not be requested

Results:

The Independent Variable: Information Technology:

Independent variable consists of four variables (Internet, Intranet, Modern Electronic Programs, and Application of Health Information Systems). Table (3) indicates the arithmetic means and standard deviations for each variable of Information Technology, where each variable arranged descending according to the degree of appreciation based on the arithmetic means as follows:

Table (3) Means and Std. Deviation of Information Technology arranged descending

No.	Statement	Mean	Std. Deviation
3	Modern Electronic Programs	3.892	0.721
4	Application of Health Information Systems	3.820	0.775
2	Intranet	3.716	0.795
1	Internet	3.530	0.798
Total Average		**3.740**	**0.772**

Source: prepared by the researcher based on the field study

Table (3) indicates the attitudes of the sample towards questionnaire statements of Information Technology in Health Facilities in Najran; Arithmetic mean (3.740), S.t (0.772) (high appreciation).

The table noted that the first rank in Information Technology was Modern Electronic Programs with mean reach (3.892) Std. (0.721) at high degree of appreciation. Next was Application of Health Information Systems with mean reaches (3.820) Std. (0.775) at high degree of appreciation. In the third rank came Intranet with mean reaches (3.716) Std. (0.795) at high degree of appreciation. The last rank was for Internet with mean reaches (3.530) Std. (0.798) at moderate degree of appreciation.

The Dependent Variable: Reducing Epidemics in Health Facilities in Najran:

To identify the Dependent Variable "Reducing Epidemics in Health Facilities in Najran", Means and Std. Deviation were applied, where table (4) shows the results:

Table (4) Means and Std. Deviation of Reducing Epidemics in Health Facilities in Najran

No.	Statement	Mean	Std. Deviation	Rate
25	Health Facilities in Najran has strict instructions to prevent the spread of epidemics	4.133	0.659	High
26	Health Facilities in Najran is conducting training courses for employees to reduce the spread of epidemics.	3.959	0.682	High
27	There is careful management to deal with medical waste.	3.880	0.729	High
28	Health Facilities in Najran adopts international standards to prevent the spread of epidemics.	3.905	0.744	High
29	There are high levels of sterilization in Health Facilities in Najran.	4.121	0.749	High
30	Epidemics in the Health Facilities in Najran are rare	3.941	0.755	High
Average		3.990		High

Source: prepared by the researcher based on the field study

Table (4) indicates the attitudes of the sample towards questionnaire statements of Reducing Epidemics in Health Facilities in Najran; Average mean (3.990) (High appreciation).

Table (5) noted that the organizational creativity means ranged [3.880-4.133] at high degree of appreciation for all Paragraphs. The results showed that paragraph (25) has the highest level of appreciation, which stated "Health Facilities in Najran has strict instructions to prevent the spread of epidemics", with mean reached (4.133), Std. Deviation (0.659) at high level of appreciation. Paragraph (27), was at the lower level which stated, "There is careful management to deal with medical waste", where the mean was (3.880) Std. Deviation (0.729) at high level of appreciation.

The study hypotheses Test:

The Main Hypothesis:

H0: There is a significant relationship between information technology (Internet, Intranet, modern electronic programs, application of health information systems) and Spread of Epidemics in government hospitals in the Najran region.

To test this hypothesis, multi regression used to find out if there is a statistically significant relationship between information technology (Internet, Intranet, modern electronic programs, application of health information systems) and Spread of Epidemics in government hospitals in the Najran region at significance level ($\alpha \leq 0.05$).

Model Summary:

Table (5) Model Summary main hypothesis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.726a	.526	.518	.37530

a. Predictors: (Constant), Application, Internet, Intranet, Modern

Source: prepared by the researcher based on the field study

Table (5) shows the value of the Regression coefficient between the independent & dependent variable, reaching its value (0.726) as shown, the value of the coefficient of determination (R^2) reaches value of (0.526), which indicates that (52.6%) of changes in dependent variable caused by independent variables.

Table (6) represents the results of analysis of independent variables (Internet, Intranet, modern electronic programs, application of health information systems) and Spread of Epidemics in government hospitals in the Najran region to test the significance of regression model:

Table (6) ANOVA[a] independent variables and Spread of Epidemics

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.108	4	9.277	65.866	.000b
	Residual	33.381	237	.141		
	Total	70.489	241			

a. Dependent Variable: Reducing

b. Predictors: (Constant), Application, Internet, Intranet, Modern

Source: prepared by the researcher based on the field study

Table (6) analysis of variance, which aims to identify the explanatory model of independent variable information technology and Spread of Epidemics in government hospitals in the Najran region through examined (F).

The Examined (F) value was equal to (65.866) with possibility value (0.00) which is lower than the specific value (0.05), and that shows that there is a significant relationship exists at significance level ($\alpha \leq 0.05$).
Therefore, we reject the null hypothesis and accept the alternative:

There is a significant relationship between information technology (Internet, Intranet, modern electronic programs, application of health information systems) and Spread of Epidemics in government hospitals in the Najran region.

Thus, it can be said that at least one variable of independent variables could have significant relationship with dependent variable, and this is determined by a significant multiple regression test equation coefficients.

Multivariate Regression Morality:

Table (7) shows the values of the regression coefficients for the statistical tests.

Table (7) Coefficients Multiple Regression between the independent variables and Spread of Epidemics in government hospitals

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.254	.200		6.263	.000
Internet	.057	.049	.057	1.169	.243
Intranet	.008	.067	.009	.119	.906
Modern Electronic Programs	.170	.072	.180	2.373	.018
Application of Health Information Systems	.482	.074	.544	6.497	.000

a. Dependent Variable: Reducing

Source: prepared by the researcher based on the field study

Sub Hypothesis:

H01: There is a significant relationship between Internet and Spread of Epidemics in government hospitals in the Najran region.

The table (7) indicates that Internet have not a significant relationship with Spread of Epidemics in government hospitals in the Najran region, where the calculated value of (T) was (1.169), which is lower than its tabular value (1.984) at significance level (0.243), which is more than the specific value (0.05).

Therefore, we reject the alternative hypothesis and accept the null:

There is no significant relationship between Internet and Spread of Epidemics in government hospitals in the Najran region.

H02: There is a significant relationship between Intranet and Spread of Epidemics in government hospitals in the Najran region.

The table (7) indicates that Intranet have not a significant relationship with Spread of Epidemics in government hospitals in the Najran region, where the calculated value of (T) was (0.119), which is lower than its tabular value (1.984) at significance level (0.906), which is more than the specific value (0.05).

Therefore, we reject the alternative hypothesis and accept the null:

There is no significant relationship between Intranet and Spread of Epidemics in government hospitals in the Najran region.

H03: There is a significant relationship between modern electronic programs and Spread of Epidemics in government hospitals in the Najran region.

The table (7) indicates that modern electronic programs have a significant relationship with Spread of Epidemics in government hospitals in the Najran region, where the calculated value of (T) was (2.373), which is more than its tabular value (1.984) at significance level (0.018), which is lower than the specific value (0.05).

Therefore, we reject the null hypothesis and accept the alternative:

There is no significant relationship between modern electronic programs and Spread of Epidemics in government hospitals in the Najran region.

H04: There is a significant relationship between application of health information systems and Spread of Epidemics in government hospitals in the Najran region.

The table (7) indicates that application of health information have a significant relationship with Spread of Epidemics in government hospitals in the Najran region, where the calculated value of (T) was (6.497), which is more than its tabular value (1.984) at significance level (0.00), which is lower than the specific value (0.05).

Therefore, we reject the null hypothesis and accept the alternative:

There is no significant relationship between application of health information systems and Spread of Epidemics in government hospitals in the Najran region.

Conclusion:

The study concluded that there is a high degree of appreciation for Information Technology in Health Facilities in Najran, due to the efficiency of its variables. The study found that Modern Electronic Programs was in the first rank, in the second rank came the Application of Health Information Systems, and in the third rank was the Intranet, where these variables were at a high level of appreciation. Moreover, in the fourth and last rank was the Internet, at moderate level of appreciation. These results indicate a high degree of Information Technology in Health Facilities in Najran.

In addition, the study concluded that Reducing Epidemics was at a high level in Health Facilities in Najran, where it was found that Health Facilities in Najran has strict instructions to prevent the spread of epidemics. In addition, the study showed that there is careful management to deal with medical waste in Health Facilities in Najran, as well as Health Facilities in Najran adopt international standards to prevent the spread of epidemics.

Moreover, through testing the study hypotheses, the study concluded the following results:

There is a significant relationship between information technology (Internet, Intranet, modern electronic programs, application of health information systems) and Spread of Epidemics in government hospitals in the Najran region.

From this result, the study showed the following:

There is no significant relationship between Internet and Spread of Epidemics in government hospitals in the Najran region.

There is no significant relationship between information technology Intranet and Spread of Epidemics in government hospitals in the Najran region.

There is a significant relationship between information technology modern electronic programs and Spread of Epidemics in government hospitals in the Najran region.

There is a significant relationship between information technology application of health information systems and Spread of Epidemics in government hospitals in the Najran region.

Recommendation:

The study recommends limiting the spread of epidemics in health facilities in Najran, with a focus on the following points:

- Online communication takes place through clear, easy and fast foundations.
- Online communication is available to all employees around the clock
- Internet lines are constantly updated in line with the rapid developments.
- There are private communication networks (intranets) in health facilities in Najran.
- Health facilities in Najran have the latest medical applications.
- The use of electronic medical file programs resulted in providing sufficient information to make a priority decision in providing health care.

References

Aljawhri, Isam (2020), The impact of the emerging corona pandemic on the information technology industry in Egypt: opportunities and threats, *Egyptian Journal of Development and Planning*, Volume 28, Number, 1.

Almylood, Sahanin (2017), The contribution of information and communication technology to achieving the dimensions of sustainable development "Algeria case study", Master Thesis, Université Djillali Liabes, Algeria.

Damour, Iyad (2022), The Impact of Corona Virus on Contractual Imbalance and Ways to Treat it in Lease Contracts: A Legal Jurisprudence Study (Jordan as a Model), *Dirasat, Shari'a and Law Sciences*, Volume 49, No. 2.

Dash, Sabyasachi, Shakyawar,, Sushil, Sharma, Mohit and Kaushik, Sandeep (2019), Big data in healthcare: management, analysis and future prospects, *Journal of Big Data*, volume 6, Number, 54.

De Bruin, Yuri, Lequarre, Anne-Sophie, McCourt, Josephine, Clevestig, Peter, Pigazzani, Filippo, Jeddi, Maryam, Colosio, Claudio and Goulart, Margarida (2020), Initial impacts of global risk mitigation measures taken during the combatting of the COVID-19 pandemic, *Safety Science*, Volume 128.

Ding, Xiaorong, Ji, David, Lovell, Nigel, Bonato, Paolo et al. (2021), Wearable Sensing and Telehealth Technology with Potential Applications in the Coronavirus Pandemic, *IEEE Reviews in Biomedical Engineering*, Vol. 14.

Golinelli, Davide, Boetto, Erik, Carullo, Gherardo, Nuzzolese, Andrea, Landini, Maria and Fantini, Maria (2020), How the COVID-19 pandemic is favoring the adoption of digital technologies in healthcare: a literature review, *medRxiv - the preprint server for Health Sciences*.

Musa, George, Chiang, Po-Huang, Sylk, Tyler, Bavley, Rachel, Keating, William, Lakew, Bereketab, Tsou, Hui-Chen, Hoven, Christina (2013), Use of GIS Mapping as a Public Health Tool—From Cholera to Cancer, *Health Services Insights*, Volume 6.

Rubinelli, Sara, Myers, Kara, Rosenbaum, Marcy and Davis, Denise (2020), Implications of the current COVID-19 pandemic for communication in healthcare, *Elsevier Public Health Emergency Collection*, Volume 103, Issue 6.

Sharif, Ayyoob, Khavarian-Garmsir, Amir and Kummitha, Rama (2021), Contributions of Smart City Solutions and Technologies to Resilience against the COVID-19 Pandemic: A Literature Review, *Sustainability*, Issue 18.

Tilahun, Binyam, Gashu, Kassahun, Mekonnen, Zeleke, Endehabtu, Berhanu and Angaw, Dessie (2021), Mapping the Role of Digital Health Technologies in Prevention and Control of COVID-19 Pandemic: Review of the Literature, *IMIA Yearbook of Medical Informatics.*

Wang, Qiang, Su, Min, Zhang, Min and Li, Rongrong (2021), Integrating Digital Technologies and Public Health to Fight Covid-19 Pandemic: Key Technologies, Applications, Challenges and Outlook of Digital Healthcare, *International Journal of Environmental Research and Public Health*, Vol. 18.

Yamamoto, Jorge, de Souza, Izabel, Letaif, Leila and Cobello-Júnior, Vilson (2021), Information technology challenges in a public hospital during the COVID-19 pandemic, *Clinics*, Issue 76.

Zaman, Akib, Islam, Muhammad, Zaki, Tarannum and Hussain, Mohammad (2020), ICT Intervention in the Containment of the Pandemic Spread of COVID-19: An Exploratory Study, arXiv, Vol. 1.