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Addressing the ability and challenges to implementing the patient monitoring system for chronic disease in Iraqi hospitals: DOLYIA Hospital as a case study

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ABSTRACT

The increasing use of smart technologies and mobile devices has significantly impacted healthcare, improving medical services both inside and outside hospitals. Chronic diseases such as diabetes, heart disease, and hypertension are major global economic and social challenges. The Internet of Things (IoT) enables the integration of connected devices to monitor patients' health and provide doctors with real-time information. However, very few studies on implementing a patient monitoring system in Iraqi hospitals exist that can effectively guide most health organizations in their patient care endeavors.

Therefore, this study aims to examine the capabilities and challenges of implementing a patient monitoring system for chronic diseases in Iraqi hospitals, focusing on technological and human obstacles that may hinder its adoption.

A qualitative, exploratory research design was used to collect data from doctors, hospital staff at Dolyia Hospital, and patients in Dolyia City, Salah al-Din Province, through personal interviews and an electronic questionnaire. SPSS software was used for data analysis.

The findings indicate a positive relationship between medical staff's digital competence and the successful implementation of the system. Additionally, a statistically significant link was found between effective digital infrastructure and the success of the chronic disease monitoring system.

Keywords: Internet of Things (IoT), Internet of Medical Things (IOMT), Diabetic disease, monitoring application.

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معالجة إمكانية وتحديات تنفيذ نظام مراقبة المرضى للأمراض المزمنة في المستشفيات العراقية، مستشفى الضلوعية حالة دراسية

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الملخص

لقد أثر الاستخدام المتزايد للتقنيات الذكية والأجهزة المحمولة بشكل كبير على الرعاية الصحية، مما أدى إلى تحسين الخدمات الطبية داخل المستشفيات وخارجها. وتُعد الأمراض المزمنة مثل مرض السكري وأمراض القلب وارتفاع ضغط الدم من التحديات الاقتصادية والاجتماعية العالمية الرئيسية. يتيح إنترنت الأشياء (IoT) دمج الأجهزة المتصلة لمراقبة صحة المرضى وتوفير معلومات في الوقت الفعلي للأطباء. ومع ذلك، لا يوجد سوى عدد قليل جدًا من التطبيقات الجيدة لنظام مراقبة المرضى في المستشفيات العراقية، والذي يمكنه توجيه معظم المؤسسات الصحية بشكل فعال في مساعي رعاية مرضاها. لذلك، تهدف هذه الدراسة إلى دراسة إمكانيات وتحديات تطبيق نظام مراقبة المرضى للأمراض المزمنة في المستشفيات العراقية، مع التركيز على العقبات التكنولوجية والبشرية التي قد تعيق اعتماده. تم استخدام تصميم بحث نوعي واستكشافي، حيث تم جمع البيانات من الأطباء وموظفي مستشفى الضلوعية والمرضى في مدينة الضلوعية بمحافظة صلاح الدين، من خلال المقابلات الشخصية والاستبيان الإلكتروني. تم استخدام برنامج SPSS لتحليل البيانات. تشير النتائج إلى وجود علاقة إيجابية بين الكفاءة الرقمية للطاقم الطبي والتنفيذ الناجح للنظام. بالإضافة إلى ذلك، تم العثور على ارتباط ذي دلالة إحصائية بين البنية التحتية الرقمية الفعالة ونجاح نظام مراقبة الأمراض المزمنة.

INTRODUCTION

The Internet is now pervasive, has impacted practically every region of the world, and is having unthinkable effects on people's lives. The internet is paving the way for a time when connectivity will be much more ubiquitous and a vast array of appliances will be online. The Internet of Things (IoT) has evolved alongside the expansion of the internet. Prof. Kevin Ashton first used the term "Internet of Things" (IoT) in 1999 to describe a network of physical objects and devices, known as "Things," connected to the Internet. "The interconnection of machines and devices through the internet, enabling the creation of data that can yield analytical insights and support new operations" is a common definition of the Internet of Things [(1)]. Every object is a node in the Internet of Things and is connected to other objects via a network; this type of system enables information sharing, including sending and receiving [(2)]. The most recent developments and patterns in communication and information technology are essential to the healthcare sector. These improvements led to the introduction of the Internet of Medical Things (IoMT), enabling real-time, remote, and continuous patient monitoring. Among the many difficulties that IoMT designs continue to confront are broadband, communication protocols, big data and data volume, flexibility, dependability, data management, data gathering, data processing and analytics availability, cost effectiveness, data security and privacy, and energy efficiency. These days, the current technology and healthcare sectors are. An examination of wearable sensor-based remote health monitoring via the internet of medical things (IoMT): a case study for individuals with diabetes [(3)]. Diabetes is a condition linked to fasting, abnormal glucose levels in the body, and disorders of several organs and organ systems, including the kidneys, eyes, nervous system, and blood vessels. One debate is connected to the disruption of these systems, which also alters heart rate, produces heart stroke, and leads to artery disease. It also affects heart failure and heart congestion. It has been noted that macrovascular disease claims the lives of around 805 diabetic individuals annually. When a patient has elevated blood glucose levels without a prior diagnosis of diabetes, it is known as gestational diabetes. New diagnosis and classification standards were released in 1997 by the Americans with Disabilities Act. 8. The destruction of B cells causes type 1 diabetes; defective insulin resistance causes type 2 diabetes, genetic problems create other forms of diabetes, and pregnancy causes gestational diabetes. These are the four clinical classes that make up the classification of diabetes mellitus [(4)]. The globe has been greatly impacted by the growing use of smart devices and mobile technology in healthcare. Health professionals are increasingly leveraging these technologies' advantages, leading to notable improvements in healthcare both in and outside clinical settings. Chronic diseases such as diabetes, heart disease, and hypertension are major global economic and social challenges. The Internet of Things (IoT) enables the integration of connected devices to monitor patients' health and provide doctors with real-time information. However, there are few, limited, and almost non-existent implementations of a Patient Monitoring System in Iraqi hospitals, which leads to inefficiency and poor guidance in most health organizations in their patient care endeavors. In this regard, this paper contributes by examining the capabilities and challenges of implementing a Patient Monitoring System for Chronic Diseases in Iraqi hospitals, focusing on technological and human obstacles that may hinder its adoption.

The rest of the paper is structured as follows: the related works are stated in the following section. Section 3 gives an overview of the methods and materials required. Section 4 shows the results and analysis of the developed system. Section 5 presents some conclusions and future work.

RELATED WORKS

IoMT improves remote patient monitoring, lowers medical errors, and expedites access to clinical data, all of which contribute to higher-quality healthcare. wearable sensors, smart devices, and data integration, enhancing hospital operating efficiency and cutting costs. IoMT helped shift healthcare from reactive to proactive treatment[(5)]. Information and Communication Technology (ICT) is investigating real-time patient monitoring in Iraqi healthcare facilities. These systems use ICT for patient observation worldwide, highlighting the advantages of remote consultations, ongoing health monitoring, and effective data sharing in the medical field. By facilitating prompt treatments and improved chronic illness management, ICT-enabled health systems have greatly improved patient care, decreased hospital readmissions, and increased the effectiveness of healthcare services. Although ICT systems have demonstrated potential, obstacles about infrastructure, technical know-how, and budgetary limitations have prevented their broad adoption and deployment in Iraqi healthcare facilities [(6)]. Developing an intelligent system for diagnosing gestational diabetes by analyzing historical and current patient data, and the importance of IoT-based diagnostic tools for improving early detection [(7)]. Iraq's public healthcare system faces challenges, particularly during the crisis, due to political instability, economic constraints, and limited healthcare facilities. Several previous studies have examined the inadequacies in Iraq's healthcare system, focusing on a lack of funding, medical supplies, and skilled workers. The current conflict worsens the underinvestment in the healthcare system that has persisted for years. The impact of these systemic inadequacies on public health outcomes was investigated, including the spread of infectious diseases, maternal and child mortality, and the incapacity to properly manage chronic disorders. Several methods and changes, including publicprivate partnerships and the implementation of more sophisticated health information systems, are being considered as potential answers to the healthcare problem (7). investigated hormone fluctuations and enzyme activity in women with PCOS (polysystic ovarian syndrome), providing information on the biochemical monitoring of long-term illnesses that could be aided by Internet of Things-based health monitoring devices (8). Provide a more robust alarm system to prevent theft and tampering with surveillance equipment. The system's concepts can be used for Internet of Things-based medical monitoring, improving security and dependability in medical settings (9).

One study advocated developing a Unified Patient Information System (UPIS) for Iraqi hospitals to address fragmented patient data, inadequate data management, and departmental interoperability issues. The study identified constraints, including aging infrastructure and a shortage of trained workers. It also examined similar installations in other countries, highlighting the importance of electronic medical records and linked data systems in improving healthcare quality and reducing medical errors. (10).

METHOD

Study design

This study used a case study approach at DOLYIA Hospital to determine whether a system for monitoring patients with chronic disease can be built. This study primarily employed a qualitative, exploratory strategy through semi-structured interviews to unearth rich, context-specific data. (11).
In this paper, the methodology steps are presented in the flowchart 1.

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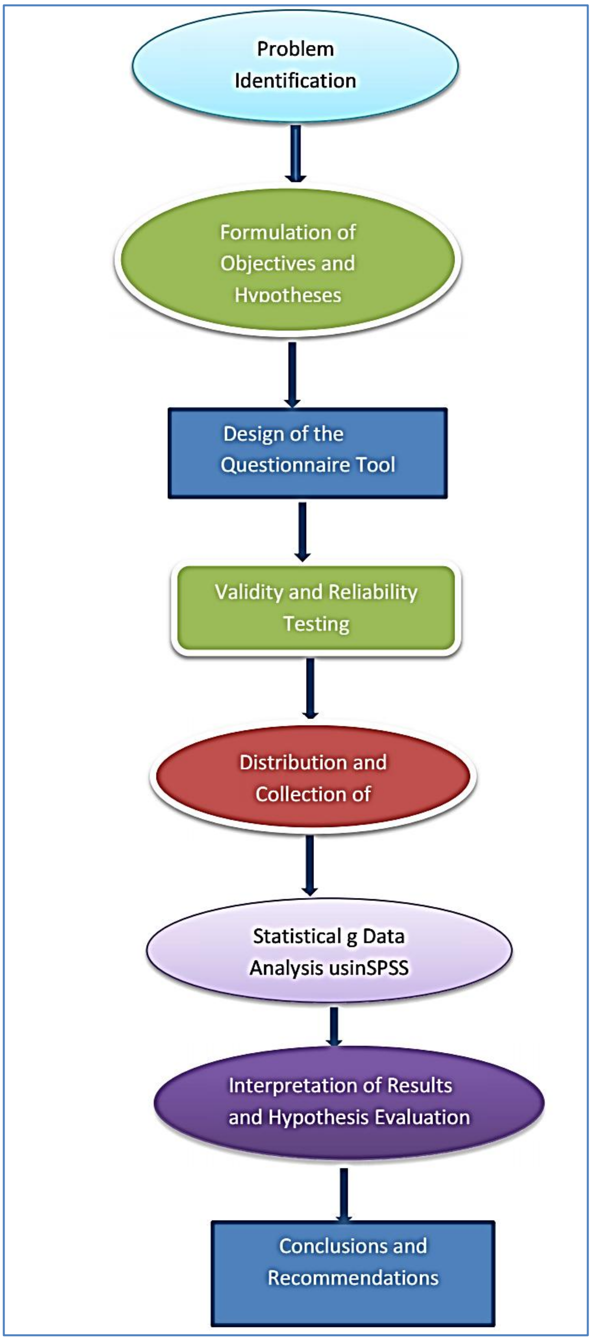

Flowchart 1 illustrates the methodology.

In this study, the qualitative descriptive-analytical method is used to examine the ability to implement a digital monitoring system for chronic disease patients at Al-Doloyia hospital. The data were collected from the staff of Doloyia Hospital and patients using a structured questionnaire distributed to a simple random sample of approximately 60 medical and administrative staff. The questionnaire consisted of three sections: demographic information, infrastructure availability and reliability, and staff knowledge and competence in digital systems. Data analysis was conducted using SPSS software, applying descriptive statistics (frequencies, percentages, means, standard deviations), Cronbach's Alpha for reliability testing, one-sample t-tests to assess hypotheses related to infrastructure and staff competency, independent samples t-tests or ANOVA to examine differences based on demographic variables, and Pearson correlation to explore relationships between variables. The study is limited to Al-Doloyia Hospital and focuses exclusively on medical and administrative staff and patients. The research process followed a systematic sequence, starting with problem identification, the formulation of important objectives and hypotheses, the design of the questionnaire, pilot testing, data collection, statistical analysis, and concluding with the interpretation of results and recommendations.

RESULT

The opinions of the research sample were collected to determine whether there is a system for monitoring patients with chronic diseases (diabetes). In the absence of a system, we are exploring the feasibility of implementing a system to track and monitor patients with chronic diseases. The questionnaire was conducted on three Dimensions, which are the infrastructure that was consist three dimensions: the Internet The staff specializing in programming, the speed of communication and dealing with patient information, the second dimension is internal network, and the third dimension is database, and the opinions of the sample were taken for the purpose of knowing the extent of the possibility of implementing the system, since we were certain that there was no system in the first place. To achieve this goal, a set of procedures must be followed to demonstrate the questionnaire's reliability within the study sample, as there are reliability ranges to indicate it. The reliability value was extracted to ensure its accuracy within the ranges stipulated in the literature, as in the following table (1):

Table 1: Table of ranges.

Ranges	Values
Weak	60-50
Acceptable	70-60
Good	80-70
Very good	90-80
Excellent	100-90

Note that the answers have a reliable value if they are greater than or equal to (70%), as the table below shows the values obtained for the sample's opinions, which proved the possibility of conducting the questionnaire according to the ranges mentioned above. It can be concluded that the questionnaire captures the sample's opinions in a manner that serves the research goals.

The Alpha Cronbach's reliability testing

In Alpha Cronbach reliability testing, the alpha values shown below indicate that the questionnaire fulfilled its desired purpose, as the results were within the very good and above range. Questions were asked that illustrate the possibility of building a monitoring system. There is a lot of detail, but it's not my goal. The alpha Cronbach's table (2):

Table 2: Alpha Cronbach's values for reliability testing

<table>
<tr><td rowspan="3">X</td><td>X1</td><td>0.80</td><td rowspan="3">0.92</td><td rowspan="4">0.96</td></tr>
<tr><td>X2</td><td>0.81</td></tr>
<tr><td>X3</td><td>0.90</td></tr>
<tr><td>Y</td><td>Y</td><td>0.91</td><td></td></tr>
</table>

Hypothesis Testing

To assess the feasibility of designing a system to monitor patients with chronic diseases (diabetes), the hypothesis that a strong, effective digital infrastructure is associated with the successful implementation of such a system must be tested. It was developed in the form of a statistical hypothesis, which is proven or denied based on the results obtained, as follows:

H0: The first hypothesis states that there is no statistically significant relationship between the presence of effective digital infrastructure and the success of the chronic disease monitoring system.

H1: The second hypothesis posits a statistically significant relationship between the presence of effective digital infrastructure and the success of the chronic disease monitoring system.

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Table 3: Number of correlations.

Correlations								
		X1	**X2**	**X3**	**X**	**Y**	**Z**	**Xyz**
X1	Pearson Correlation	1						
	Sig. (2-tailed)							
X2	Pearson Correlation	.520**	1					
	Sig. (2-tailed)	.003						
X3	Pearson Correlation	.661**	.663**	1				
	Sig. (2-tailed)	.000	.000					
	Sig. (2-tailed)	.000	.000	.000				
Y	Pearson Correlation	.324	.613**	.675**	.633**	1		
	Sig. (2-tailed)	.081	.000	.000	.000			
	Sig. (2-tailed)	.009	.004	.000	.000	.000		
xyz	Pearson Correlation	.670**	.746**	.887**	.896**	.825**	.898**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).								

In the table(3) above table of correlation: The correlations between the sample axes and dimensions of the questionnaire as a whole were taken for the purpose of testing the first hypothesis H0, the null hypothesis, the null hypothesis, was rejected, which indicates that there is a positive relationship between the presence of the digital infrastructure and the success of the chronic disease patient monitoring system, according to the opinion of individuals in the sample, as the result of the correlations is excellent (0.01). While their point of view differed regarding the internal network, there was no positive relationship between the presence of digital infrastructure and the success of the chronic disease monitoring system, according to the individuals in the sample. The second point of the first axis: Lack of digital competencies among medical staff:

Null hypothesis: The null hypothesis that says that there is no positive relationship between the level of digital medical staff competencies and the success of implementing chronic disease monitoring according to the variable X1. The alternative hypothesis states that there is a positive relationship between the level of competence of the medical staff and the success of implementing chronic disease monitoring, as measured by variable X1. Independent sample test table (4).

Table 4: Independent sample test for variable X1table.

Levence Test for the quality of variance	F	Sig	T	Df	Sig(2-tailed)
X1 -equal variance assumed	.132	.719	.066	28	.948
Equal variance not assumed.			.064		.949

The results of the independent samples t-test are taken for analysis, and through the analysis, we can conclude the following:

Levene's test for equality of variances yielded the following results: F = 0.132, with a p-value of 0.719. The result shows that there is no statistically significant difference between the variances of the two samples. This indicates that the variances of the two samples are equal, and the t-test for the difference in means shows t = 0.066 with df = 28 and a significant level of Sig. (2-tailed) = 0.948, which shows that there is no statistically significant difference between the means of the two samples. We conclude that there is insufficient evidence to reject the null hypothesis, indicating that the two samples have no statistically significant difference in their means.

The t-test results indicated insufficient evidence to reject the null hypothesis. The null hypothesis will be accepted, which states that there is no statistically significant difference between the two samples' means. The second hypothesis states that medical staff lack digital competencies.

The second hypothesis: Lack of digital competencies among medical staff:

The statistical hypothesis concluded is that there is no relationship between the level of competencies of male staff and the success of implementing the system for monitoring patients with chronic diseases, as measured by variable X2.

The alternative hypothesis concluded that there is a positive relationship between the level of digital competencies of medical staff and the success of implementing patient monitoring for patients with chronic diseases, as measured by variable X2. It was calculated according to the independent sampling table (5).

Table 5: independent sampling for variable X2 table.

Levence Test for the quality of variance	F	Sig.	T	Df	Sig(2tailed)
X2 equal variance assumed	*.121*	*.731*	1.019	28	.317
Equal variance not assumed.			.999	19.740	.330

The results of the independent samples t-test are taken for analysis, and through the analysis, we can conclude the following:

Levene's test for equality of variances gave us the following values: F = 0.121, with a significant level of Sig = 0.731. The result shows that there is no statistically significant difference between the variances of the two samples. This indicates that the variances of the two samples are equal, and the t-test for the difference in means shows t = 0.066 with df = 28 and a significant level of Sig. (2-tailed) = 0.317, which shows that there is no statistically significant difference between the means of the two samples. We conclude that there is insufficient evidence to reject the null hypothesis, indicating that the two samples have no statistically significant difference in their means.

The second hypothesis: Lack of competence among the variable medical staff X3

Statistical hypothesis H0: It was concluded that there is no relationship between the level of medical staff competencies and the success of implementing the chronic disease patient monitoring system according to the variable X3. Alternative hypothesis H1: It was concluded that there is a relationship between the level of digital competence of medical staff and the success of implementing a system for monitoring patients with chronic diseases, according to the independent sampling table (6).

Table 6: Independent sampling test for variable X3 table.

Levence Test for the quality of variance	F	Sig.	T	Df	Sig(2tailed)
X3 equal variance assumed	.640	.430	-.193-	28	.849
Equal variance not assumed.			-.201-	23.822	.842

The results of the independent samples t-test are taken for analysis, and through the analysis, we can conclude the following:

Levene's test for equality of variances gave us the following values (F = 0.640), with a significant p-value of Sig = 0430. The result shows that there is no statistically significant difference between the variances of the two samples. This means the variances of the two samples are equal, and the t-test for the difference in means shows t = -0.193 with df = 28 and a significant level of Sig. (2-tailed) = 0.849, which shows that there is no statistically significant difference between the means of the two samples. We conclude that there is insufficient evidence to reject the null hypothesis, indicating

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that the two samples have no statistically significant difference in their means.

Statistical hypothesis H0: where it was concluded that there is no relationship between the level of medical staff competencies and the success of implementing the chronic disease patient monitoring system according to the variable x.

Alternative hypothesis H1: It was concluded that there is a relationship between the level of digital competence of the medical staff and the success of implementing the chronic disease patient monitoring system according to the variable x.

Table 7: independent samples test for variable X table

Levence Test for the quality of variance	F	Sig	T	Df	Sig(2-tailed)
X equal variance assumed	.501	.485	1.052	28	.302
X has equal variance, not assumed.			1.080	22.717	.291

The results of the independent samples t-test are taken for analysis, and through the analysis, we can conclude the following:

Levene's test for equality of variances gave us the following values (F = 0.501), with a significant p-value of Sig = 0.485. The result shows that there is no statistically significant difference between the variances of the two samples. This means the variances of the two samples are equal, and the t-test for the difference in means shows t = 1.052 with df = 28 and a significant level of Sig. (2-tailed) = 0.302, which shows that there is no statistically significant difference between the means of the two samples. We conclude that there is insufficient evidence to reject the null hypothesis, indicating that the two samples have no statistically significant difference in their means.

Statistical hypothesis H_0: It was concluded that there is no relationship between the level of medical staff competencies and the success of implementing the chronic disease patient monitoring system according to the variable y.

Alternative hypothesis H1: It was concluded that there is a relationship between the level of digital competence of the medical staff and the success of implementing the chronic disease patient monitoring system according to the variable y.

Table 8: Independent samples test for variable Y of the table.

Levenshtein test for quality of variance	F	Sig	T	Df	Sig(2-tailed)
y equal variance is assumed	.050	.825	-.064-	28	.950
y equal variance is not assumed			-.063-	20.697	.950

The results of the independent samples t-test are taken for analysis, and through the analysis, we can conclude the following:

Levene's test for equality of variances gave us the following values: F = 0.050, with a p-value of Sig = 0.823. The result shows that there is no statistically significant difference between the variances of the two samples, which means that it can be assumed that the variances of the two samples are equal, and the value of the t-test for the equation of means shows that the value of t = -0.064 with a degree of freedom df = 28 and a significant level of Sig. (2-tailed) = 0.950, which shows that there is no statistically significant difference between the means of the two samples. We conclude that there is insufficient evidence to reject the null hypothesis, indicating that the two samples have no statistically significant difference in their means.

Statistical hypothesis H0: It was concluded that there is no relationship between the level of medical staff competencies and the success of implementing the chronic disease patient monitoring system according to variable Z.

Alternative hypothesis H1: It was concluded that there is a relationship between the level of digital competence of the medical staff and the success of implementing the chronic disease patient monitoring system according to the variable Z.

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Table 9: Independent samples test for variable Z table.

Levenshtein test for quality of variance	F	Sig	T	Df	Sig(2-tailed)
Z equal variance assumed	1.181	.286	1.482	28	.150
Z equal variance not assumed.			1.563	24.481	.131

The results of the independent samples t-test are taken for analysis, and through the analysis, we can conclude the following:

Levene's test for equality of variances yielded the following results: F = 1.181, p-value = .286. The result shows that there is no statistically significant difference between the variances of the two samples. This indicates that the variances of the two samples are equal, and the t-test for the difference in means shows t = 1.482 with df = 28 and a significant level of Sig. (2-tailed) = 0.150, which shows that there is no statistically significant difference between the means of the two samples. We conclude that there is insufficient evidence to reject the null hypothesis, indicating that the two samples have no statistically significant difference in their means.

Age group: Statistics that were taken based on the absence of missing data in the questionnaire when analyzing it.

Table 10: ANOVA test for variable X1 table

X1	Sum of squares	Df	Mean square	F	Sig
Between Groups	2.221	2	1.111	1.349	.276
Within Groups	22.223	27	.823		
Total	24.444	29			

Analyze the results of the ANOVA test.

The ANOVA table shows the results of the variance test for the X1 variable based on age groups. The table was interpreted as follows:

Sum of Squares: It represents the sum of the squares of the deviations from the general group mean. Df (Degrees of Freedom): represents the number of groups minus 1. Mean Square (MS) represents the square of the sum divided by the degrees of freedom.

F statistic: F represents the ratio of the square of the mean between groups to the square of the mean within groups. (Sig.) The value: p represents the probability of obtaining it if the hypothesis is correct.

Between Groups: The square of the sum between groups appears as 2.221, and df=2.

Within Groups: The sum of squares within groups appears as 22.223 and df=27.

F: The F statistic shows a value of 1.349.

LSD test:

The LSD test shows contradictory results with the Tukey test. The LSD test shows statistically significant differences between the age groups (20-30), (41-50), (31-40), and (41-50) in the X1 variable. The p-value (Sig.) is less than 0.05 in these comparisons, indicating that there is sufficient evidence to reject the null hypothesis that there are no differences between groups.

That led to these results: the Tukey test shows that there are no statistically significant differences between age groups in the variable analysis, ensuring the validity of the results. Note: We cannot draw firm conclusions about the impact of information technology on the variable X1 from these results alone.

The ANOVA test does not provide sufficient evidence of statistically significant differences among age groups for the variable X1.

Table 11: ANOVA test for variable X² table.

X2	Sum of squares	Df	Mean square	F	Sig
Between Groups	2.506	2	1.253	1.253	.298
Within Groups	26.752	27	.991		
Total	29.259	29			

The result of the ANOVA table (11) for variable X2:

Between Groups: The square of the sum between groups appears as 2.506 (df=2).

Within Groups: The square of the sum within groups appears as 26.752 (df=27).

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F: The F statistic shows a value of 1.253.

The conclusion of this table: The p-value (0.298) indicates that there is not enough evidence to reject (accept) the null hypothesis that there are no statistically significant differences between age groups in the variable X2.

There is insufficient evidence of statistically significant differences in the average values across age groups, as shown in Table 12.

Table 12: ANOVA table of the variable X3.

X3	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.931	2	.466	.378	.689
Within Groups	33.238	27	1.231		
Total	34.169	29			

The result of the ANOVA table (12) variable X3: Between Groups: The square of the sum between groups appears as 0.931 and df=2.

Within Groups: The square of the sum within groups appears as 33.238 (df=27).

F: The F statistic shows a value of (0.387).

The conclusion of this table: The p-value (0.689) indicates that there is not enough evidence to reject (accept) the null hypothesis that there are no statistically significant differences between age groups in the variable X1.

There is insufficient evidence to show statistically significant differences in the average values across age groups.

Table 13: ANOVA table of the variable X

X	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.275	2	.637	.840	.443
Within Groups	20.480	27	.759		
Total	21.755	29			

The result of the ANOVA table (13) for the variable X:

Between Groups: The square of the sum between groups appears as 1.275 (df=2).

Within Groups: The within-groups sum of squares is 20.480 and df=27.

F: The F-statistic shows a value of 0.840.

The conclusion of the ANOVA table: The p-value (0.443) indicates that there is not enough evidence to reject (accept) the null hypothesis that there are no statistically significant differences between age groups in the variable X1, as there is insufficient evidence that there are statistically significant differences.

Table 14: ANOVA table of the variable Y

Y	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.610	2	.305	.176	.840
Within Groups	46.799	27	1.733		
Total	47.408	29			

The result of the ANOVA table (14) for variable y: Between Groups: The square of the sum between groups appears as 0.610 and df=2.

Within Groups: The square of the sum within groups appears as 46.799 (df=27).

F: The F statistic shows a value of (0.176). And that led to this conclusion:

The p-value (0.840) indicates that there is not enough evidence to reject (accept) the null hypothesis that there are no statistically significant differences between age groups in the variable X1.

There is insufficient evidence to show statistically significant differences in the averages between age groups.

Table 15: ANOVA table of the variable Z

Z	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.440	2	.720	.574	.570
Within Groups	33.836	27	1.253		
Total	35.275	29			

The result of the ANOVA table (15) for the variable z is as follows:

Between Groups: The square of the sum between groups appears as 1.440 (df=2). Within Groups: The square of the sum within groups appears as 33.836 (df=27).

F: The F statistic shows a value of 0.574. The p-value (0.570) indicates that there is not enough evidence to reject (accept) the null hypothesis that there are no statistically significant differences between age groups in the variable X1. As there is not sufficient evidence that

CONCLUSION

This study concluded that AL-Doloyia Hospital has the staff competencies and infrastructure necessary to implement a digital monitoring system for chronic disease patients. Preparedness is important in both the availability of digital tools and the staff's positive perception of digital healthcare solutions. These results support the effectiveness of a digitization strategy aimed at improving the efficiency and accuracy of chronic disease monitoring. Also, there are statistically significant differences in the average values across age groups. This study concludes that Al-Doloyia Hospital has the foundational infrastructure and staff competencies necessary to implement a digital monitoring system for chronic disease patients. The readiness is evident in both the availability of digital tools and the staff's positive perception of digital healthcare solutions. These findings support moving forward with a digital transformation strategy to improve the efficiency and accuracy of chronic disease monitoring.

Recommendations

In this study, the recommendations are to develop training programs to enhance data entry and error management for hospital staff. The possibility of moving from a paper-based system to a digital one, enabling continuous evaluation and feedback collection after implementation, to improve the system.

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