Determination of the Impact of Electronic Health Information Systems upon Medical, Medical Backing and Administrative Business Fields in Al-Kindy Teaching Hospital

تحديد آثر نظم المعلومات الصحية الإلكترونية على مجالات العمل الطبية والطبية المساندة والإدارية في مستشفى الكندي التعليمي

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المستخلص

الهدف: لتحديد آثر نظم المعلومات الصحية الإلكترونية على مجالات العمل الطبية والطبية المساندة والإدارية في مستشفى الكندي التعليمي ولتحديد العلاقة مابين هذا الآثر وصفاتهم الديموغرافية كعدد سنوات الخدمة ومكان العمل والتعليم.

المنهجية: إستخدم تصميم وصفي تحليلي للفترة من 25 أبريل 2016ولغاية 28 مايس 2016 بعد ذلك أختيرت عينة غرضية "غير إحتمالية" من (50) فرد. العينة مكونة من (25) طبيب و إختصاص طبي مساند و (25) إداري من المساهمين في مجالات العمل المختلفة ذات العلاقة بإختصاصهم في مستشفى الكندي التعليمي . تم تبني وتطوير إستمارة إستبيانية من (68) فقرة تعتمد التدوين الذاتي لغرض الدراسة الحالية ومكونة من (6) أجزاء لقياس الظاهرة الجديرة بالدراسة . رتبت ورمزت الإستبانة حسب مقياس ليكرت ذوالخمس مستويات موافق بشدة =5 وموافق=4 وغير متأكد=3 وغير موافق=2 وغير موافق بشدة=1. تم تحديد ثبات الإتساق الداخلي للإستبانة من خلال تقنية التجزئة- النصفية وحساب معامل الإرتباط كرونباخ ألفا (0،96) للمقياس الداخلي. حدد صدق المحتوى للإستبانة من خلال لجنة من (9) خبراء في حقول الطب والطب المساند والإدارة . كان جمع بيانات الدراسة من خلال إستخدام إستبانة التدوين الذاتي كأداة لجمع البيانات . تم تحليل البيانات من خلال تطبيق إسلوب تحليل البيانات الإحصائي الوصفي كالتكرارات والنسب المئوية والحساب الكلي للقيم والوسط الحسابي للقيم ومعامل الإرتباط بيرسون.

النتائج: أشارت الدراسة الحالية إلى وجود آثر كبير لأنظمة المعلومات الصحية الإلكترونية على مجالات العمل الهلاكات الطبية والطبية المساندة والإدارية. الزيادة في مستوى صفات هذه الملاكات كعدد سنوات الخدمة ومكان العمل والتعليم يتزامن معها آثر كبير لأنظمة المعلومات الصحية الإلكترونية.

التوصيات: أوصت الدراسة الحالية إلى إقامة شبكة وطنية لأنظمة المعلومات الصحية الإلكترونية والتي من خلالها ترتبط المؤسسات الصحية. زيادة وعي جميع الملاكات الطبية والطبية المساندة والإدارية نحو فوائد إستخدام أنظمة المعلومات الصحية الإلكترونية . إمكانية إجراء بحوث أخرى مع عينة كبيرة ومواقع مختلفة وصفات متعددة.

Abstract

Objective(s): To determine the impact of the Electronic Health Information Systems upon medical, medical backing and administrative business fields in Al-Kindy Teaching Hospital and to identify the relationship between such impact and their demographic characteristics of years of employment, place of work, and education.

Methodology: A descriptive analytical design is employed through the period of April 25th 2016 to May 28th 2016. A purposive "non- probability" sample of (50) subject is selected. The sample is comprised of (25) medical and medical backing staff and (25) administrative staff who are all involved in related business fields in Al-Kindy Teaching Hospital. A self-report questionnaire, of (68) item, is adopted and developed for the purpose of the present study and it is consisted of (6) subscales that measure the phenomenon underlying the study. The questionnaire is rated and scored on 5-level type Likert scale of strongly agree= 5, agree=4, uncertain= 3, disagree=2, and strongly disagree=1. Internal consistency reliability is determined for the questionnaire through split-half technique and computation of Cronbach's Alpha Correlation Coefficient of (r= 0.96) for the internal scale. Content validity for the questionnaire is determined through panel of (9) experts in the fields of medicine, medical backing, and management. Data are collected through the use of the self-report questionnaire as mean of data collection. Data are analyzed through the application of the descriptive statistical data analysis approach of frequencies, percentages, and computation of total scores, mean of scores and Pearson Correlation Coefficient.

Results: The present study indicates that the Electronic Health Information Systems have great impact upon medical, medical backing and administrative business fields. The higher the level of these staff characteristics of years of employment, place of work and education, the greater the impact of the Electronic Health Information Systems.

Recommendations: The present study recommends that establishment of a nationwide network for Electronic Health Information Systems by which health care organizations can be connected. Increase all medical, medical backing and administrative staff awareness toward the benefits of using the Electronic Health Information Systems. Further research can be conducted with large sample size, different settings and various characteristics.

Key Words: Electronic Health Information Systems, Medical staff, Medical Backing staff, Administrative staff, Business fields

Introduction:

Health information systems refer to any system that captures, stores, manages or transmits information related to the health of individuals or the activities of organizations that work within the health sector. This definition incorporates things such as district level routine information systems, disease surveillance systems, and also includes laboratory information systems, hospital patient administration systems (PAS) and human resource management information systems (HRMIS). Overall, a well-functioning HIS is an integrated effort to collect, process, report and use health information and knowledge to influence policy and decision-making, program action, individual and public health outcomes, and research [(1)].

A strong health information system (HIS) is vital to the health systems' functioning and improved health outcomes. Health information systems are the backbone of national health systems and provide essential information to enable all decision makers—from policy makers to health providers—to make evidence-informed choices for budgeting on health, health workforce needs, and services for citizens [(2)].

The World Health Organization (WHO) stated that the proper collection, management and use of information within healthcare systems "will determine the system's effectiveness in detecting health problems, defining priorities, identifying innovative solutions and allocating resources to improve health outcomes [(3)].

A hospital information system (HIS) is an element of health informatics that focuses mainly on the administrational needs of hospitals. In many implementations, a HIS is a comprehensive, integrated information system designed to manage all the aspects of a hospital's operation, such as medical, administrative, financial, and legal issues and the corresponding processing of services (Wikipedia, 2016).

Based on the early stated facts, the present study ought to determine the impact of electronic health information systems upon medical, medical backing and administrative business fields in Al-Kindy Teaching Hospital.

Methodology:

A descriptive analytical design is employed throughout the present study for the period of June 14th 2015 to August 15th 2015. A purposive "non- probability" sample of (50) subject is selected. The sample is comprised of (25) medical and medical backing staff and (25) administrative staff who are all involved in the process of decision making in Al-Kindy Teaching Hospital.

A self-report questionnaire, of (49) item, is adopted and developed for the purpose of the present study [(5)]. It is consisted of (4) subscales of types of electronic health information systems used in Al-Kindy Teaching Hospital (5) item; the impact of the use of electronic health information systems upon medical and medical backing business fields (17) item; the impact of the use of electronic health information systems upon administrative business fields (15) item; and Impedimenta that limit the use and efficiency of the electronic health information systems in Al-Kindy Teaching Hospital (12) item. The questionnaire is rated and scored on 5-level type Likert scale of strongly agree= 5, agree=4, uncertain= 3, disagree=2, and strongly disagree=1. Internal consistency reliability is determined for the questionnaire through split-half technique and computation of Cronbach's Alpha Correlation Coefficient of (r= 0.96) for the internal scale. Content validity for the questionnaire is determined through panel of (9) experts in the fields of medicine, medical backing, and management.

Data are collected through the use of the self-report questionnaire as mean of data collection. Data are analyzed through the application of the descriptive statistical data analysis approach of frequencies, percentages, and computation of total scores, mean of scores and Pearson Correlation Coefficient.

Mean of scores is computed for the determination of items' significance contribution to the impact of Electronic Health Information Systems upon medical, medical backing and administrative decisions. A mean of score equal to less than (3) is considered not significant, equal to three is considered significant and more than (3) is considered highly significant.

The impact of the use of Electronic Health Information Systems is determined through computation of total scores of items and rated a high (36.5- 50), moderate (22.8- 36.4), and low (10-22.7) for the impact of the use of electronic health information systems upon decisions of the medical and medical backing staff; and high (34-45), moderate (22-33),and low (9-21)for the impact of the use of electronic health information systems upon the administrative decisions.

The relationship between the impact of the Electronic Health Information Systems upon business fields and the subjects' demographic characteristics is determined through the computation of Pearson Correlation Coefficient.

Results:

Throughout the course of data analysis, results of the study are tabulated and presented with regard to the study objective.

Results out of this table depict that electronic health information systems have great impact upon medical and medical backing business fields in Al-Kindy Teaching Hospital (80%).

Table (1) The Impact of Electronic Health Information Systems upon Medical and Medical Backing Business Fields in Al-Kindy Teaching Hospital

The impact of Electronic Health Information Systems upon Medical and Medical Backing Business Fields in Al-Kindy Teaching Hospital		
Low 17-39	Moderate 40- 62	**High** **63- 85**
0	5(20%)	**20(80%)**

Table(2) Mean of Scores for Items of the Impact of Electronic Health Information Systems upon Medical and Medical Backing Business Fields in Al-Kindy Teaching Hospital

Item	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	MS	Sig.
1. It facilitates the connection of information together to conduct medical surveys and research.	**8**	**10**	**6**	**0**	**1**	3.96	HS
2. It facilitates the process of communication and coordination between internal departments with the electronic medical records departments..	**4**	**15**	**4**	**2**	**0**	3.84	HS
3. It facilitates the process of filling forms and obtaining the necessary information from the clients electronically.	4	13	7	0	1	3.76	HS
4. It facilitates the process of communication and coordination between specialized clinics and medical backing departments.	5	10	8	2	0	3.72	HS
5. It facilitates the process of reaching the medical record.	5	12	8	0	0	3.88	HS
6. It contributes to saving patients' related data.	8	11	6	0	0	4.08	HS
7. It strongly contributes to the preparation of work related data.	4	12	7	0	2	3.64	HS
8. It contributes to the communication process and information exchange with other hospitals and	6	10	8	1	0	3.84	HS

MS= Mean of Scores, Sig.= Level of Significance, HS= Highly Significant

Table(2) To be Continued

Item	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	MS	Sig.
medical centers.							
9. It carries all the results of laboratory investigations' electronically between laboratory, internal departments, specialized clinics and emergency department and it has the capacity to tell about the abnormal results and how to link them to the patient and his/her health status.	6	10	8	0	1	3.8	HS
10. It provides for integral medical network through the connection of medical images and video movies with digital electronic medical record by PACS and DICOM.	4	16	4	1	0	3.92	HS
11. It provides for the process of coding health information with respect to universal classifications and laws, such as ICD 10, SNOMED, and CPT.	4	9	7	5	0	3.48	HS
12. It provides employees and students with necessary information through the reach of different medical data bases, such as references, specialized medical journals.	6	13	5	1	0	3.96	HS

MS= Mean of scores, Sig.= Level of significance, HS= Highly Significant

Table(2) To be Continued

Item	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	MS	Sig.
and medical programs.							
13. It contributes to the process of promoting medical teaching through electronic teaching.	4	15	4	1	1	3.8	HS
14. It provides refrain reports for observation of epidemics and communicable diseases with World Health Organization standards and facilitates the communication and coordination between health system and external parties which are concerned with the prevention of such diseases.	5	15	3	2	0	3.92	HS
15. It electronically saves medical records and patients related information through electronic archives and make it possible to go back to them at any time.	7	14	3	1	0	4.08	HS
16. It provides the opportunity to entirely leave the paper medical record and replace it with electronic one.	6	9	6	4	0	3.68	HS
17. It contributes to the increase of relaxation and facilities means for	8	14	3	0	0		

MS= Mean of Scores, Sig.= Level of Significance, HS= Highly Significant

Continues…

Table(2) To be Continued

Item	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	MS	Sig.
patients in the hospital, such as appropriate food, short waiting time, fast services and increase of privacy.	8	14	3	0	0	4.2	HS

MS= Mean of Scores, Sig.= Level of Significance, HS= Highly Significant

This table presents that mean of scores for items of the impact of electronic health information systems upon medical and medical backing business fields in Al-Kindy Teaching Hospital is highly significant.

Table (3) The impact of Electronic Health Information Systems upon Administrative Business Fields in Al-Kindy Teaching Hospital

The impact of Electronic Health Information Systems upon Administrative Business Fields in Al-Kindy Teaching Hospital		
Low 15-34.3	Moderate 34.54.5	**High** **54.6-75**
0	2(8%)	**23(92%)**

Results out of this table reveal that electronic health information systems have great impact upon administrative business fields in Al-Kindy Teaching Hospital (92%).

Table (4) Mean of Scores for Items of the Impact of Electronic Health Information Systems upon Administrative Business Fields in Al-Kindy Teaching Hospital

Item	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	MS	Sig.
1. It saves human energies which are required for accomplishment of administrative tasks that can be treated electronically.	**6**	**15**	**2**	**0**	**0**	4.173	HS
2. It assists in saving efforts of employees which are routine in nature and makes them creative business.	**9**	**12**	**2**	**0**	**0**	4.304	HS
3. It makes employees capable to acquire analytical and artistry skills.	**10**	**11**	**2**	**0**	**0**	4.347	HS
4. It contributes in re classification and description of jobs with regard to skills and artistry and technical needs which are required as result of employing electronic health information system.	**5**	**12**	**5**	**0**	**1**	3.869	HS
5. It facilitates specialized reports preparation process to high level management.	**5**	**13**	**5**	**0**	**0**	3.826	HS
6. It facilitates issuing bills for in and outpatients.	**8**	**11**	**4**	**0**	**0**	4.173	HS
7. It facilitates the comparison of actual expenditures and income with estimated ones and shows the increase and decrease.	**7**	**9**	**7**	**0**	**0**	4	HS

MS= Mean of Scores, Sig.= Level of Significance, HS= Highly significant

Continues…

Table(4) To be Continued

Item	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	MS	Sig.
8. It facilitates the counting of the real costs for the hospital's different programs and activities.	**5**	**12**	**6**	**0**	**0**	3.956	HS
9. It contributes to the increase of the efficiency of work and employees.	**6**	**13**	**4**	**0**	**0**	4.086	HS
10. It increases the speed and precision of work accomplishment.	**8**	**14**	**1**	**0**	**0**	4.304	HS
11. It facilitates the process of coordination, communication and information exchange between offices and departments in the hospital.	**5**	**17**	**1**	**0**	**0**	4.173	HS
12. It facilitates the process of coordination, communication and information exchange with other organizations outside the hospital, such as insurance office, Ministry of Health and other centers.	**4**	**14**	**5**	**0**	**0**	2.217	HS
13. The filing system provides that is concerned with recording the files and follows up their process in the hospital and between clinics for in and outpatients.	**8**	**12**	**3**	**0**	**0**	4.217	HS

MS= Mean of scores, Sig.= Level of Significance, HS= Highly Significant

Table (4) To be Continued

Item	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree	MS	Sig.
14. It assists in achieving patients' restrains electronically.	**3**	**12**	**6**	**0**	**2**	3.608	HS
15. It supports the possibility of using the unified health number nationwide.	**5**	**16**	**2**	**0**	**0**	4.130	HS

MS= Mean of Scores, Sig.= Level of Significance, HS= Highly Significant

This table indicates that mean of scores for items of the impact of electronic health information systems upon administrative business fields in Al-Kindy Teaching Hospital are highly significant.

Table (5) Pearson Correlation Coefficients for the Relationships between the Impact of the Electronic Health Information Systems upon Business Fields and the Demographic Characteristics of Medical and Medical Backing Staff in Al-Kindy Teaching Hospital

Demographic Characteristics of Medical and Medical Backing Staff	Impact of the Electronic Health Information Systems
Years of Employment	0.94
Place of Work	0.89
Education	0.87

Pearson correlation coefficients out of this table indicate strong positive relationships between the impact of the electronic health information systems upon business fields and the demographic characteristics of medical and medical backing staff of years of employment, place of work and education in Al-Kindy Teaching Hospital.

Table (6) Pearson Correlation Coefficients for the Relationships between the Impact of the Electronic Health Information Systems upon Business Fields and the Demographic Characteristics of Administrative Staff in Al-Kindy Teaching Hospital

Demographic Characteristics of Administrative Staff	Impact of the Electronic Health Information Systems
Years of Employment	0.97
Place of Work	0.90
Education	0.91

Pearson correlation coefficients out of this table indicate strong positive relationships between the impact of the electronic health information systems upon business fields and the demographic characteristics of administrative staff years of employment, place of work and education in Al-Kindy Teaching Hospital.

Discussion:

Discussion and interpretation of the study findings are presented relative to the study objectives. Supportive evidence is provided as being available in the literature.

Part I: The Impact of Electronic Health Information Systems upon Medical and Medical Backing Staff Business Fields in Al-Kindy Teaching Hospital

Relative to the impact of these systems upon the medical and medical backing business fields, the study findings indicate that Electronic Health Information Systems in Al-Kindy Teaching Hospital have great impact upon the medical and medical backing business fields (Table 1). Such evidence can be noted in the mean of scores for items of the impact of these systems upon business fields of medical and medical backing staff which are highly significant (Table 2). This finding has emerged due to the fact that the medical and medical backing staff is using the appropriate systems which make perfect match with multitask.

Computerized Health Information Systems have major effect on medical decisions. They contribute to their improvement; update the information on a regular base; reduce the costs of decision making; speed of already made decisions by different departments; activate the medical monitoring on the mechanism of decisions' implementation; present accurate and sufficient information about therapeutic and diagnostic tasks; and provide sufficient and comprehensive information about patient's condition[(5)]. Furthermore, information systems have great impact upon business fields of staff in the medical field. They provide accurate, sufficient and comprehensive information concerning patient care, particularly selection of treatment [(6)].

With special regards to business fields, the capacity to multitask ensures speedily business fields when compared to those systems which can only handle one task at a time [(7)].

Part II: The Impact of Electronic Health Information Systems upon Administrative Business Fields in Al-Kindy Teaching Hospital

The data analysis of the impact Electronic Health Information Systems upon administrative business fields in Al-Kindy Teaching Hospital has depicted that these systems have major impact upon business fields of administrative staff (Table 3). Such evidence is supported by the fact that mean of scores for items of this impact is highly significant ones (Table 4). As a result, decisions of administrative staff are influenced by the Electronic Health Information Systems more than decisions of medical and medical backing staff. This has emerged may be due to their wide-range experience with these systems.

It has been concluded that good management of information systems leads to good administrative business fields just in the same way poor management leads to poor administrative business fields [(8)].

With this relation, it is stated that based on the significant role that information plays in choice of business fields to be made, organizations must ensure that they have a good management information system [(9)].

So, the quality of managerial business fields depends directly on the quality of available information and the managers should therefore cultivate an environment that encourages the growth and viable sprouting of quality information [(8)].

Part III: The Relationship between the Impact of Electronic Health Information Systems and the Subjects' Demographic Characteristics in Al- Kindy Teaching Hospital

Analysis of such relationship depicts that there are strong positive relationships between the impact of the Electronic Health Information Systems and the medical, medical backing and administrative staff's characteristics (Table 5 and 6). Moreover, characteristics of administrative staff have experienced more relationship with the impact of Electronic Health Information Systems than those of medical and medical backing staff. These findings can be interpreted in a way that the higher the level of the demographic characteristics of years of employment, place of work and education; the greater the impact of Electronic Health Information Systems in Al-Kindy Teaching Hospital.

In sum, conclusion can derived as result to the early presented discussion and interpretation of the study findings. Such conclusion depicts the Electronic Health Information Systems are found to have great impact upon medical, medical backing and administrative business fields. The higher the level of these staff characteristics of years of employment, place of work and education, the greater the impact of the Electronic Health Information Systems in Al-Kindy Teaching Hospital.

Recommendations:

According to the early stated facts, the present study recommends that:

1. Establishment of a nationwide network for Health Information Systems by which health care organizations can be connected.
2. Increase all medical, medical backing and administrative staff awareness toward the benefits of using the Electronic Health Information Systems.
3. Presenting the staff with appropriate training opportunities by which their experience can be improved.
4. Further research can be conducted with large sample size, different settings and various characteristics.

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