FILE 1

INTERNET EXPLORER

RECYCLE BIN

MED439 King Saud University

Academic Leaders

Medical informatics 439

THE REFERENCE

EDITING FILE

FILE 2

Medical Informatics

Lecture 1

Lecture 2

Lecture 3

Lecture 4

Lecture 5

Lecture 6

Lecture 6

Research Focus in Medical Informatics in Saudi Arabia

Outline:

1-Definition

2-Why knowledge management

3-Examples of research in medical informatics:

- Evidence based medicine
- Medical records
- Tele-health
- Students
- Public health

4-What is next?

5-Facts and conclusion

Color index:

Main Text | **Female Slides** | **Male Slides** | **Extra** | **Important** | **Dr's Notes** | **Golden notes** | **Textbook**

ResearchFocusInMedicalInformaticsInSaudiArabia.pdf

Definitions

Medical Informatics

- "Medical informatics is a rapidly developing **scientific** field that deals with the storage, retrieval, and optimal use of biomedical **information**, **data**, and **knowledge** for problem solving and decision making." (Blois, M.S., and E.H. Shortliffe. in Medical Informatics: Computer Applications in Health Care, 1990, p. 20.). Dr. likes this definition. Problem solving: coming up with solutions for complicated situations and cases resulting in innovation.
- "Medical **informatics** is the application of computers, communications and information technology and systems to all fields of medicine - medical care, medical **education** and medical **research**." definition by MF Collen (MEDINFO '80, Tokyo, later extended).
- This definition focuses in technology more. Medical informatics isn't about info. technology or info. system, it's about data, info,knowledge.
- Medical informatics is a new field, however academically & scientifically has been their for a few decades.
- The main purpose for medical informatics is problem solving

Remember, informations is the processing of data.
-Knowledge is the interpretation and understanding of information and data.

Data

- "data are numbers, words or images that have yet to be organised or analysed to answer a specific question" (Audit Commission, 2007).
- What makes numbers, words and images all data? rawness. No exact meaning or context.

Information

Information is the result of processing, manipulating and/or organising data or combinations of data to answer question.

Knowledge

- Data, information and knowledge are not the same.
- Data, in itself is not knowledge, nor is information. Data is without a meaningful relation to anything else" (Bellinger, 2004).
- Knowledge: is the understanding and interpretation of information and its settings within a meaningful context.
- "Knowledge Involves interpreting information received, adding relevance and context to clarify the insights the information contains" (Audit Commission, 2007)
- There are numerous theories existence regarding not only the creation of knowledge, but also the different types of knowledge that exist.
- Cook and Brown (1999) define four types of knowledge: individual/explicit; individual/tacit; group/explicit; group/tacit. Skipped by doctor.
- Knowledge is the full utilization of information and data, with the potential of people's skills, competencies,...(Grey, 2009*7)

Definitions

Environment public health KM			
	Data	Information	Knowledge
Asthma	Number of hospital visits due to asthma	Asthma case data organized by geographic location, population, etc.	Understanding of the times and places to alert asthma patients due to risks posed by air quality
Air Quality	Ambient air quality monitoring data	Air quality measurements organized by geographic location and time.	

Doc Notes (438) If we look at asthma for example:

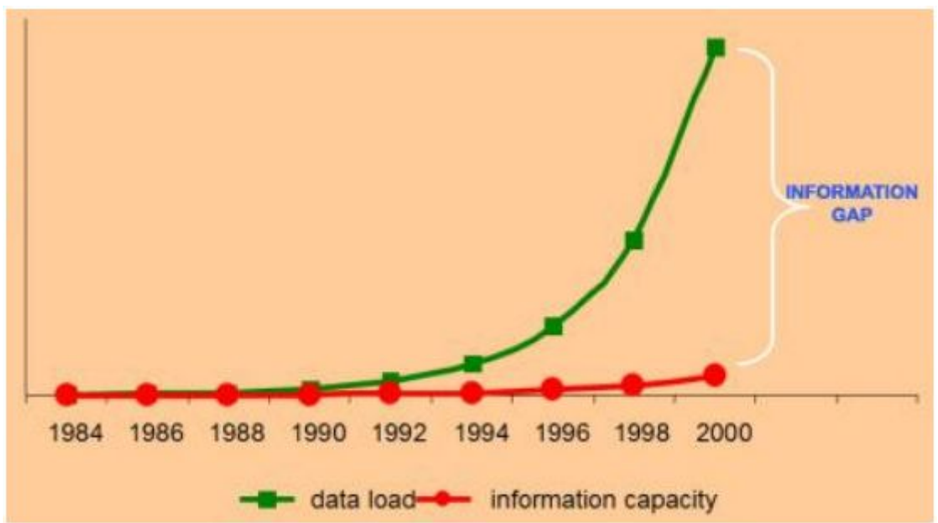
1. The NO. of hospital visits have no meaning by itself.
2. Process it by location, population, gender & time > so we have information.
3. Interpretation of info give knowledge & show us how time & gender are related to asthma risk factors & prognosis.

Why Knowledge In Health Care

Flood Information

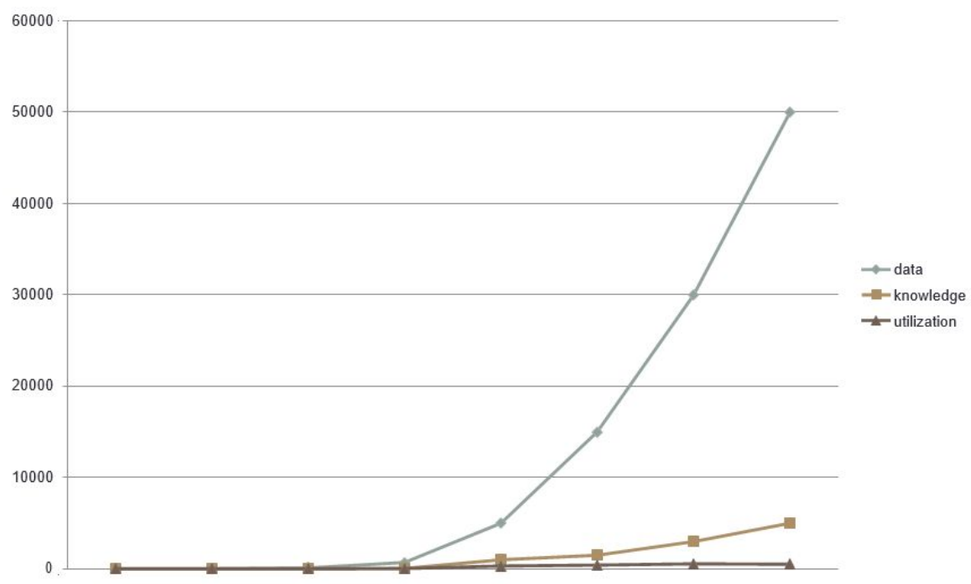
Huge gap in data acquisition and Information is the knowledge capacity

- In **First Chart** We've 2 curves, the green curve represents increased in No & amount of data from Pt file or other resources. While the red curve represents how much we're analyzing & getting useful info out of these data.
- In **the Second Chart** we've 2 curves also, the gray one show the accumulation of data with time. While the brown one shows how much we're doing interpretation.
- There's a gap because we're having data, info & knowledge but we're doing the minimal utilization.
- The informatics comes & try to fill these gap by using data, info & knowledge for CDSS, Pt safety, researches & medical services.



Data - Knowledge Utilization

- Institute of Medicine (IOM) at 1998-1999 estimated that around 98,000 patients die each year as a consequence of preventable errors. Likewise, a study of two UK hospitals found that 11% of admitted patients experienced adverse events of which 48% of these events were most likely preventable if the right knowledge was applied at the right time. Knowledge is there, but we're not applying it, if we apply it we'll be able to prevent about 50% of these errors.
- The under-utilization of healthcare knowledge contributes to improper clinical decisions, medical errors, under-utilization of resources and raise in healthcare delivery costs.



Examples of research in medical informatics

Evidence based medicine (EBM)

Definition

Is the integration of **best research evidence** with **clinical expertise** and **patient values**. Best research evidence isn't necessarily the latest.

History of EBM:
The name of EBM appeared in 1992 by group led by Gordon Guyatt at McMaster University in Canada. Since then the number of articles about evidence based practice has grown exponentially from one publication in 1992 to about 1000 in 1998 and international interest has led to the development of six evidence based journals that summarize the most relevant studies in clinical practice and have a combined worldwide circulation of over 175000.

(438)Doc Asked : What is the difference between EBM and traditional medicine (current practice) ?

The Answer : The main diff is that they're not referring to the latest best research. We use different tools (UpToDate and BMG) and then they have research like clinical trials, cohort studies that practitioners refer to for the best diagnosis and treatment.

Literature Searching	
Main benefits: Can improve the treatment of medical inpatients, even those already receiving evidence-based treatment.	**Example of a research:** to understand the value of EBM - Random sample of 146 inpatients cared for by 33 internal medicine attending physicians. The physicians were asked to diagnose patients without going back to the literature - After physicians committed to a specific diagnosis and treatment plan, investigators performed standardized literature searches and provided the search results to the attending physicians. - Attending physicians **changed treatment** for 23 (18%) of the 130 eligible patients as a result of the literature searches.

Dr's Notes (438)

- The current practice is looking mainly to expertise not to Pt (by taking the history, examinations, lab analysis and ultrasound and having the Pts values as a main concern and by looking to the best practice). It shouldn't be the latest it should be the best but most of the time the latest is the best.
- EBM works and searches on the level of info & knowledge.
- Google scholar is not just a search engine, it's an index.
- Literature is the previous researches about specific question.
    - The Question based on Hx that we collected from patients & clinical expertise.
    - We search for **knowledge** NOT data.
    - Literature is more important and accurate decision.
    - You're not going to search literature and leave patient so you use structured knowledge/database. The tool of EBM they have a structured databases that easily that you easily search for your questions and gives you the most relevant questions. And for that they train physicians how to write questions in the best way.

Examples of research in medical informatics

Medical Records (The Accenture study)

Objectives

The Accenture survey asked physicians about the extent to which they used 12 different "functions" of EMR and HIS such as electronic entry of patient notes, electronic referrals, electronic ordering and prescribing and communicating with other physicians or patients via secure email.

Methodology

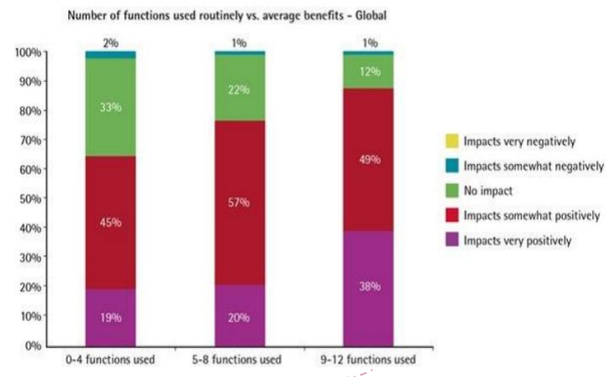
By Jim Burke, Managing Director, Accenture UK Health Industry Published Friday, 3 February 2012. Research among more than 3,700 doctors in eight countries reveals ripe opportunities to accelerate broad healthcare IT initiatives, according to a new survey from Accenture

Findings

- The findings clearly show that the broadest, fastest path to integrated, effective health practices requires outreach, education and changing mindsets.
- Results showed that physicians who are routine users of a wider range of healthcare IT functions have a more positive attitude towards the these technologies. On average across all the countries, as physicians start to use more "functions" the more positive they are about the benefits.
- Majority of doctors surveyed believe that healthcare IT does provide some common top benefits, including:
  1- Better access, quality data for clinical research (70.9%). Quality of handwriting description.
  2- Improved coordination of care (69.1 %) by sharing your knowledge/opinion/ data with others.
  3- Reduction in medical errors (66 %).
  4- Average score of (61%).
- In England, physicians perceived other healthcare IT benefits to include:
  increased speed of access to health services to patients (55.3 %).
  reduced number of unnecessary interventions and procedures (52 %).

Challenges

- The main challenge of moving from paper to electronic records is **Resistance** of professionals. They don't want to change the way they're practicing.
- If the student use the traditional database (books), they'll face problems if the doctor ask him to use electronic database (blackboard).
- The graph shows that the more you use the more positive impact you get.



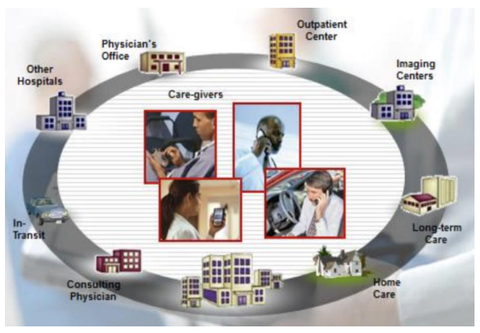
Veterans Health

Veterans Health, which runs the largest and one of the most cost-effective healthcare systems in the United States. The VA has been employing tele-health tools for more than 11 years. "The VA is absolutely a pioneer in the use of telehealth," They published a study linking telehealth and 17,000 VA patients with chronic disease that showed a tremendous impact – nearly a 20 % reduction in hospital admissions.". Less burden because you reach patients by telemedicine before they come to you. Improvement of quality of life is a result of telemedicine.

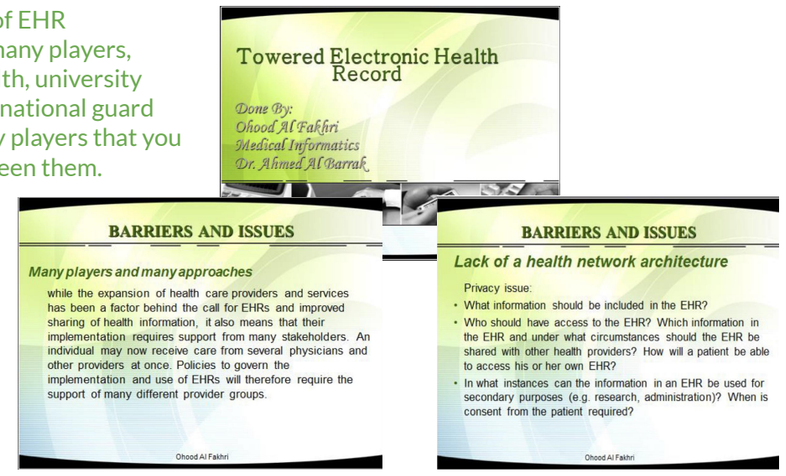
Students Examples

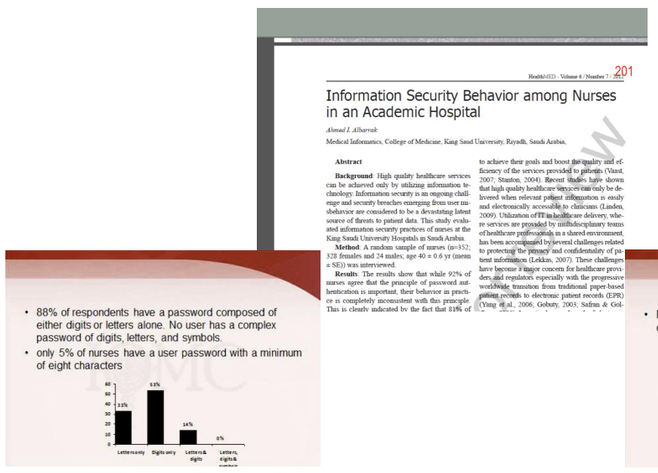
(438): Qs will not come from the following examples

This study was conducted in 2005, researchers were trying to see the impact of using ?wireless? or mobile applications Now, since 2010 mobile applications started to be one of the main sectors in healthcare. Every device you now buy has mHealth. Steps, heart rate, your personal medical record.
The study method was cross sectional, it aimed to determine opinions and attitudes of physicians when using mobile health and what's their expectations.

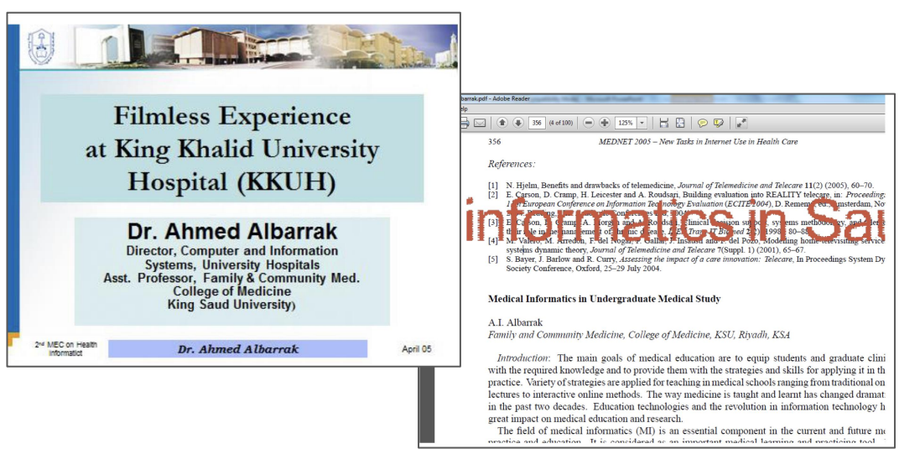


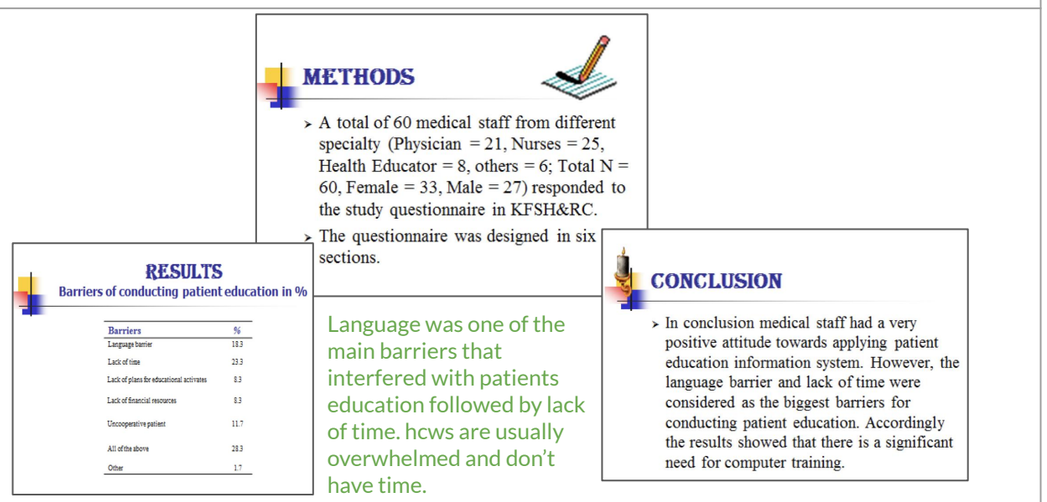
2005-2006. Challenges of EHR
one of the barriers: too many players,
You have ministry of health, university hospitals, private sector, national guard hospitals. So u have many players that you need to coordinate between them.
Lack of infrastructure
was also a barrier.



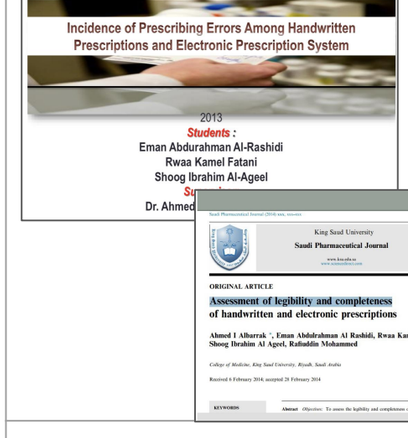


This study was conducted in King Faisal hospital.
This research was about using information technology in patients education.

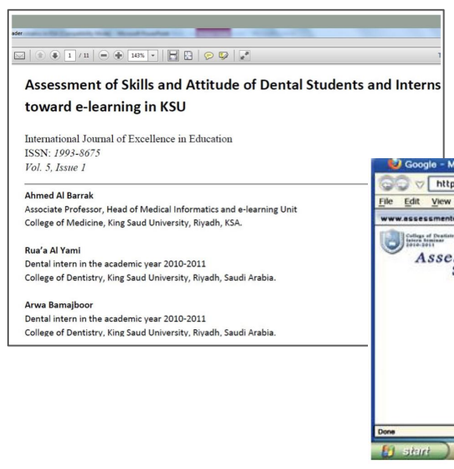


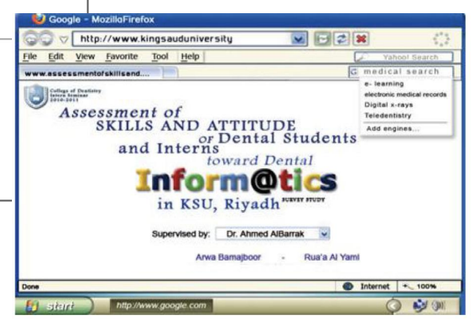


Language was one of the main barriers that interfered with patients education followed by lack of time. hcws are usually overwhelmed and don't have time.

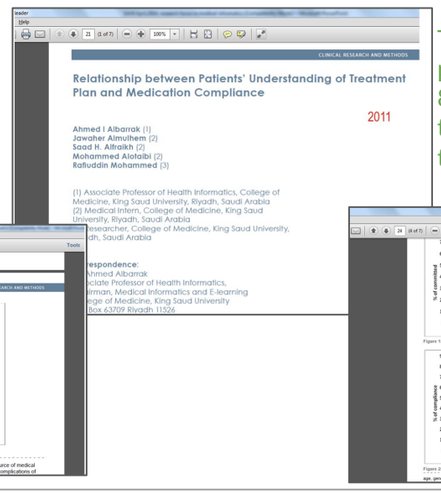


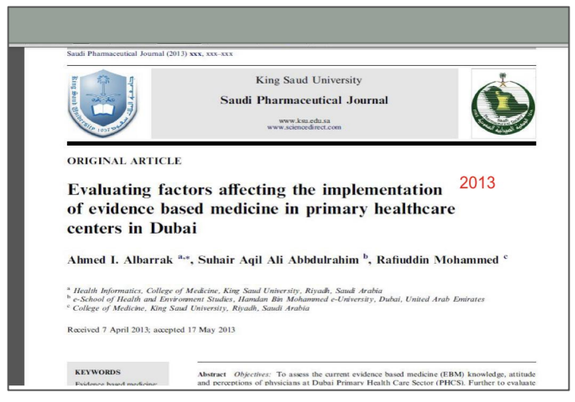
Researchers went to the pharmacy twice a day for 5 days. And they checked every prescription. Every prescription must include generic name, dosage, MRN, patient name, gender. (Some physicians don't add all required elements). In addition to that, researchers also gave the prescriptions they obtained to 2 pharmacists and asked them to evaluate the clarity of the prescriptions. Researchers then repeated the same process with E-prescription. It was found that handwritten prescriptions were responsible for as much as 37% of medication errors.



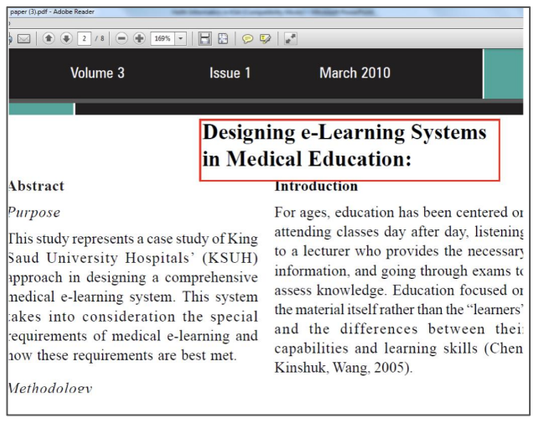


This study sought to measure patients compliance.
82% of the patients expressed their desire to be included in their management plan.





Examples cont..



Volume 3 Issue 1 March 2010

Designing e-Learning Systems in Medical Education:

Abstract

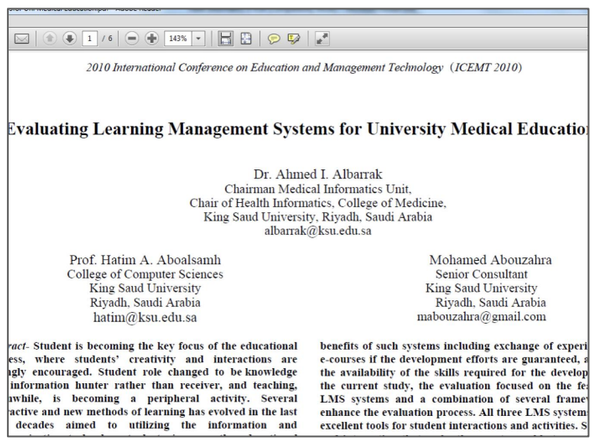
Purpose

This study represents a case study of King Saud University Hospitals' (KSUH) approach in designing a comprehensive medical e-learning system. This system takes into consideration the special requirements of medical e-learning and how these requirements are best met.

Methodology

Introduction

For ages, education has been centered on attending classes day after day, listening to a lecturer who provides the necessary information, and going through exams to assess knowledge. Education focused on the material itself rather than the "learners" and the differences between their capabilities and learning skills (Chen Kinshuk, Wang, 2005).



2010 International Conference on Education and Management Technology (ICEMT 2010)

Evaluating Learning Management Systems for University Medical Educatio

Dr. Ahmed I. Albarrak
Chairman Medical Informatics Unit,
Chair of Health Informatics, College of Medicine,
King Saud University, Riyadh, Saudi Arabia
albarrak@ksu.edu.sa

Prof. Hatim A. Aboalsamh
College of Computer Sciences
King Saud University
Riyadh, Saudi Arabia
hatim@ksu.edu.sa

Mohamed Abouzahra
Senior Consultant
King Saud University
Riyadh, Saudi Arabia
mabouzahra@gmail.com

Abstract- Student is becoming the key focus of the educational ess, where students' creativity and interactions are igly encouraged. Student role changed to be knowledge information hunter rather than receiver, and teaching, while, is becoming a peripheral activity. Several active and new methods of learning has evolved in the last decades aimed to utilizing the information and benefits of such systems including exchange of experi e-courses if the development efforts are guaranteed, the availability of the skills required for the develop the current study, the evaluation focused on the fe LMS systems and a combination of several frame enhance the evaluation process. All three LMS system excellent tools for student interactions and activities. S

Global Business and Management Research: An International Journal (2011)

Evaluation of Users Information Security Practices at King Saud University Hospitals

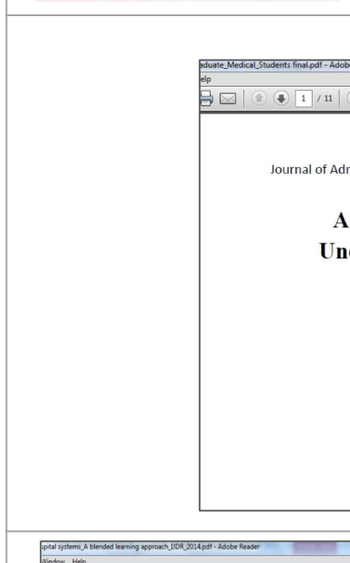
Ahmed I Albarrak
Chair of Health Informatics, College of Medicine, King Saud University, Saudi Arabia

Abstract

Purpose - This paper investigates the security behavior and awareness of employee at King Saud University hospitals, Saudi Arabia.

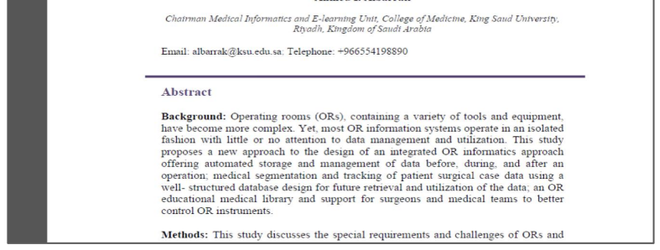
Design/methodology/approach - The study was conducted at King Saud University Hospitals (KSUHs) namely; King Khalid University Hospital (KKUH) and King Abdul Aziz University Hospital (KAUH). Data collection was done by a means of a questionnaire distributed to a random sample of 2000 employees (220 administrative staff, 500 physicians, 900 nursing staff and 500 technical staff). The questions were set to address the security behavior of users and explore their awareness on basic security issues. In total, 554 completed questionnaires were collected on which analysis was based. The (SPSS 16.0) was used throughout the analysis to generate the summary tables and perform all data analysis. Comparison was held statistically significant if ($p \leq 0.05$).

Findings - Results shows that significant differences were reported between employee categories with respect to security awareness issues such as sharing of computers, communication of password between office mates, and changing of password after being known by others or after being presented by the system. In all these situations, nursing staff appeared to be the most vulnerable group from which information security threats are reported. Then, on the least vulnerable group from which information



Conclusions

- It is clearly proofed that the technical security measures alone can NOT prevent security breaches.
- Insider threats, are difficult to detect and manage because they primarily emerge from the authorized user malicious practices
- Which emphasized that awareness training and education of users on information security issues are very important for achieving a reliable level of information security in any organizations



2013.pdf - Adobe Reader

641 *International Journal of Collaborative Research on Internal Medicine & Public Health*

Operating Room Informatics: An Approach to Managing and Utilizing Patients' Surgical Data

Ahmed I. Albarrak

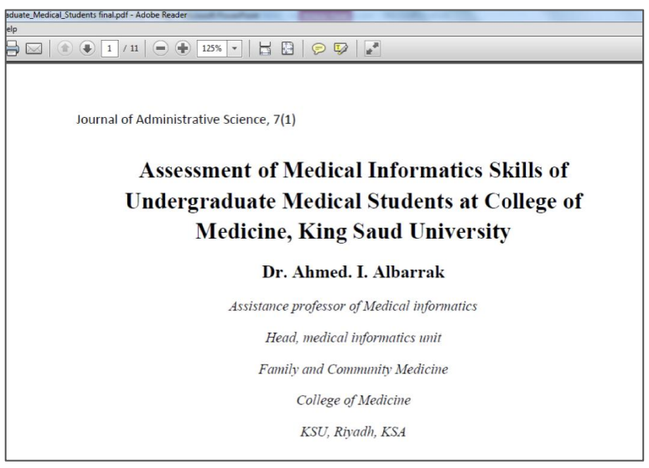
Chairman Medical Informatics and E-learning Unit, College of Medicine, King Saud University, Riyadh, Kingdom of Saudi Arabia

Email: albarrak@ksu.edu.sa. Telephone: +966554198890

Abstract

Background: Operating rooms (ORs), containing a variety of tools and equipment, have become more complex. Yet, most OR information systems operate in an isolated fashion with little or no attention to data management and utilization. This study proposes a new approach to the design of an integrated OR informatics approach offering automated storage and management of data before, during, and after an operation; medical segmentation and tracking of patient surgical case data using a well- structured database design for future retrieval and utilization of the data; an OR educational medical library and support for surgeons and medical teams to better control OR instruments.

Methods: This study discusses the special requirements and challenges of ORs and



Journal of Administrative Science, 7(1)

Assessment of Medical Informatics Skills of Undergraduate Medical Students at College of Medicine, King Saud University

Dr. Ahmed. I. Albarrak

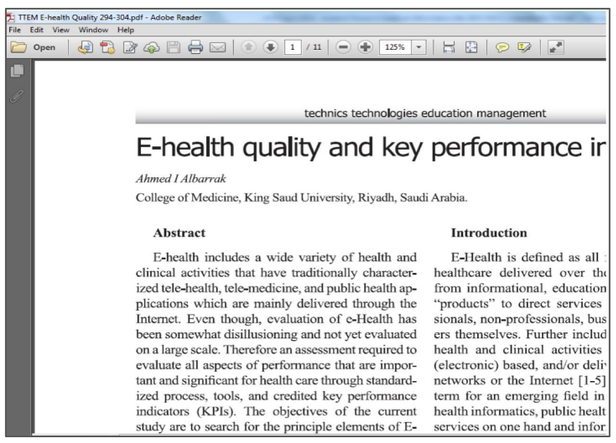
Assistance professor of Medical informatics

Head, medical informatics unit

Family and Community Medicine

College of Medicine

KSU, Riyadh, KSA



TTEM E-health Quality 294-304.pdf - Adobe Reader

technics technologies education management

E-health quality and key performance ir

Ahmed I Albarrak

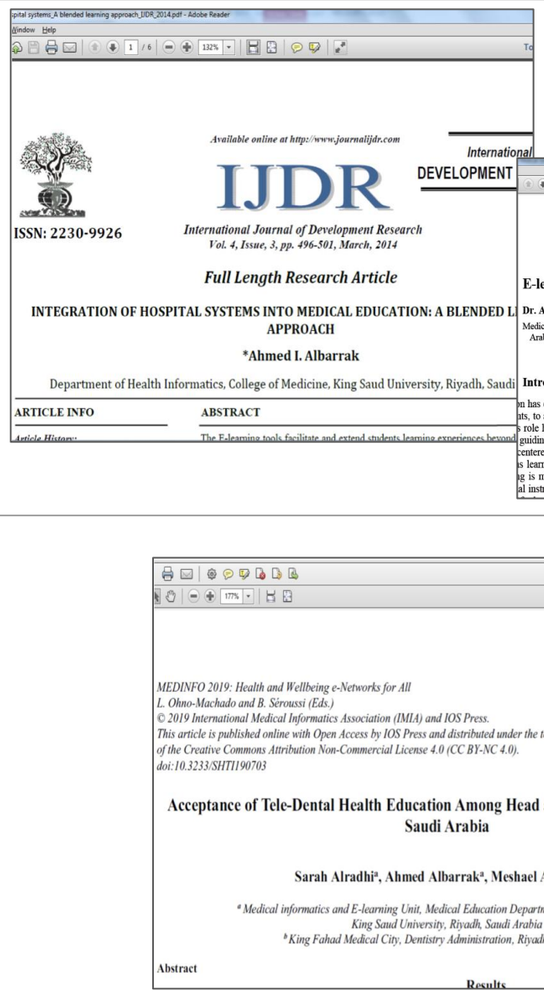
College of Medicine, King Saud University, Riyadh, Saudi Arabia.

Abstract

E-health includes a wide variety of health and clinical activities that have traditionally characterized tele-health, tele-medicine, and public health applications which are mainly delivered through the Internet. Even though, evaluation of e-Health has been somewhat disillusioning and not yet evaluated on a large scale. Therefore an assessment required to evaluate all aspects of performance that are important and significant for health care through standardized process, tools, and credited key performance indicators (KPIs). The objectives of the current study are to search for the principle elements of E-

Introduction

E-Health is defined as all healthcare delivered over the from informational, education "products" to direct services sionals, non-professionals, bus ers themselves. Further includ health and clinical activities (electronic) based, and/or deli networks or the Internet [1-5] term for an emerging field in health informatics, public healt services on one hand and infor



Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 4, Issue, 3, pp. 496-501, March, 2014

ISSN: 2230-9926

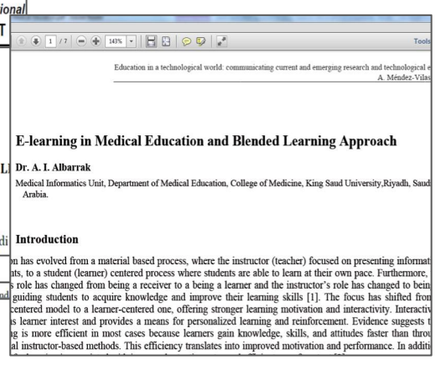
Full Length Research Article

INTEGRATION OF HOSPITAL SYSTEMS INTO MEDICAL EDUCATION: A BLENDED L APPROACH

***Ahmed I. Albarrak**

Department of Health Informatics, College of Medicine, King Saud University, Riyadh, Saudi

ARTICLE INFO **ABSTRACT**



Education in a technological world: communicating current and emerging research and technological e
A. Méndez-Vilas

E-learning in Medical Education and Blended Learning Approach

Dr. A. I. Albarrak

Medical Informatics Unit, Department of Medical Education, College of Medicine, King Saud University,Riyadh, Saudi Arabia.

Introduction

n has evolved from a material based process, where the instructor (teacher) focused on presenting informat nts, to a student (learner) centered process where students are able to learn at their own pace. Furthermore, s role has changed from being a receiver to a being a learner and the instructor's role has changed to bein guiding students to acquire knowledge and improve their learning skills [1]. The focus has shifted from centered model to a learner-centered one, offering stronger learning motivation and interactivity. Interactiv s learner interest and provides a means for personalized learning and reinforcement. Evidence suggests t g is more efficient in most cases because learners gain knowledge, skills, and attitudes faster than throu al instructor-based methods. This efficiency translates into improved motivation and performance. In additi

Journal of Infection and Public Health xxx (2019) xxx–xxx

Contents lists available at ScienceDirect

Journal of Infection and Public Health

journal homepage: http://www.elsevier.com/locate/jiph

ELSEVIER

Assessment of physician's knowledge, perception and willingness of telemedicine in Riyadh region, Saudi Arabia

Ahmed I. Albarrak[a,*], Rafiuddin Mohammed[b], Nada Almarshoud[c], Lama Almujalli[c], Rawan Aljaeed[c], Sarah Altuwaijiri[c], Tahani Albohairy[c]

[a] Medical Education Dep., Research Chair For Health Informatics and Promotion, College of Medicine, King Saud University, Riyadh, Saudi Arabia
[b] Department of Health Informatics, College of Health Sciences, Saudi Electronic University, Riyadh, Saudi Arabia
[c] College of Medicine, AlMaarefa University, Riyadh, Saudi Arabia

Tools

MEDINFO 2019: Health and Wellbeing e-Networks for All
L. Ohno-Machado and B. Séroussi (Eds.)
© 2019 International Medical Informatics Association (IMIA) and IOS Press.
This article is published online with Open Access by IOS Press and distributed under the terms of the Creative Commons Attribution Non-Commercial License 4.0 (CC BY-NC 4.0).
doi:10.3233/SHTI190703

185

Acceptance of Tele-Dental Health Education Among Head and Neck Cancer Patients in Saudi Arabia

Sarah Alradhi[a], Ahmed Albarrak[a], Meshael Alghamdi[b]

[a] *Medical informatics and E-learning Unit, Medical Education Department, College of Medicine, King Saud University, Riyadh, Saudi Arabia*
[b] *King Fahad Medical City, Dentistry Administration, Riyadh, Saudi Arabia*

Abstract

Results

OXFORD ACADEMIC

International Journal for Quality in Health Care

Issues More Content Submit Purchase Alerts About All International Jou

Development of Saudi e-health literacy scale for chronic diseases in Saudi Arabia: using integrated health literacy dimensions FREE

Nasriah Zakaria, Ohoud AlFakhry, Abeer Matbuli, Asma Alzahrani, Noha Samir Sadiq Arab, Alaa Madani, Noura Alshehri, Ahmed I Albarrak

International Journal for Quality in Health Care, Volume 30, Issue 4, May 2018, Pages 321–328, https://doi.org/10.1093/intqhc/mzy033

Published: 24 March 2018 **Article history**

Volume 30, Issue 4
May 2018

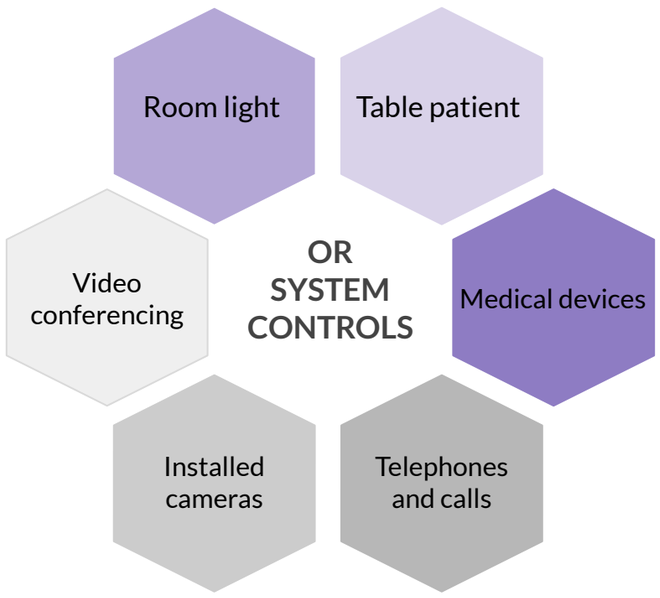
Article Contents

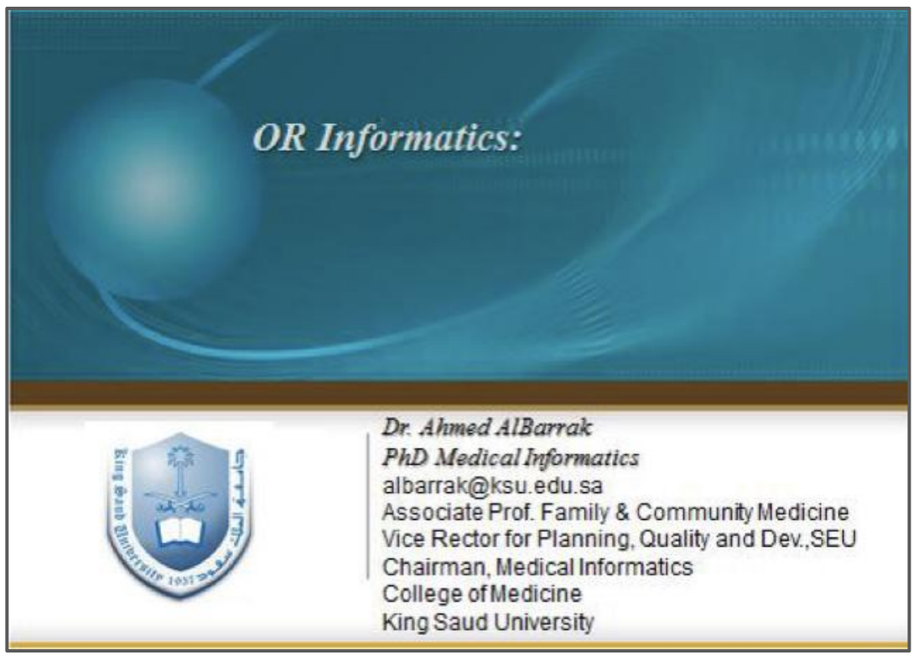
Abstract

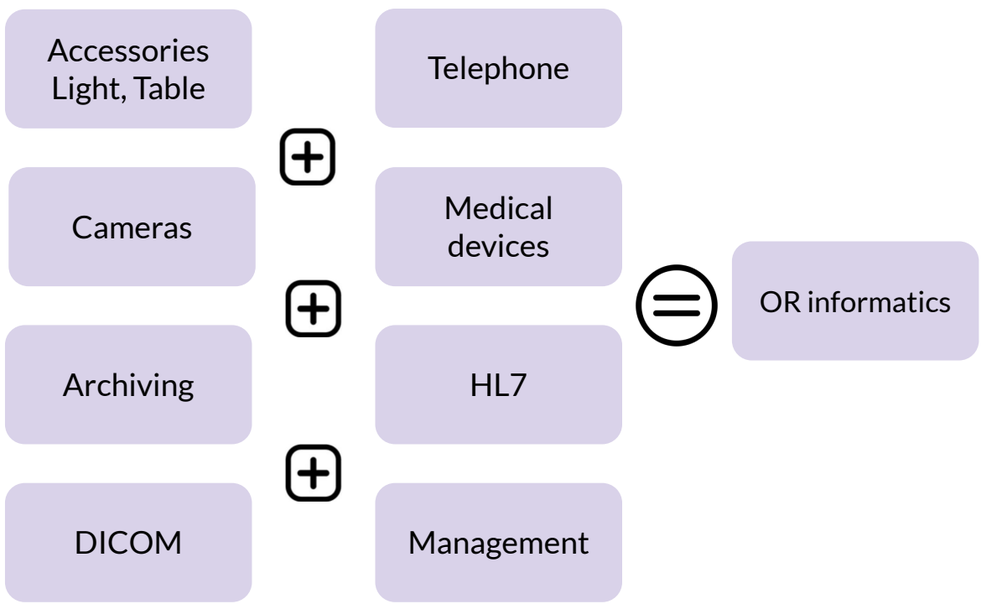
PDF Split View Cite Permissions

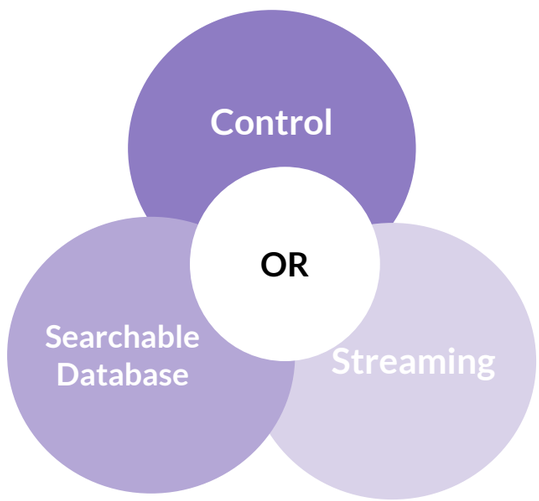
Cont..

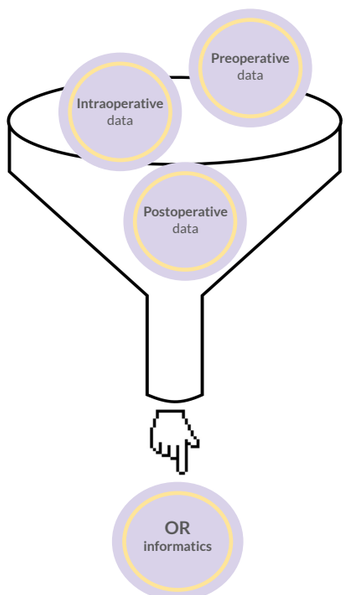
OR Informatics

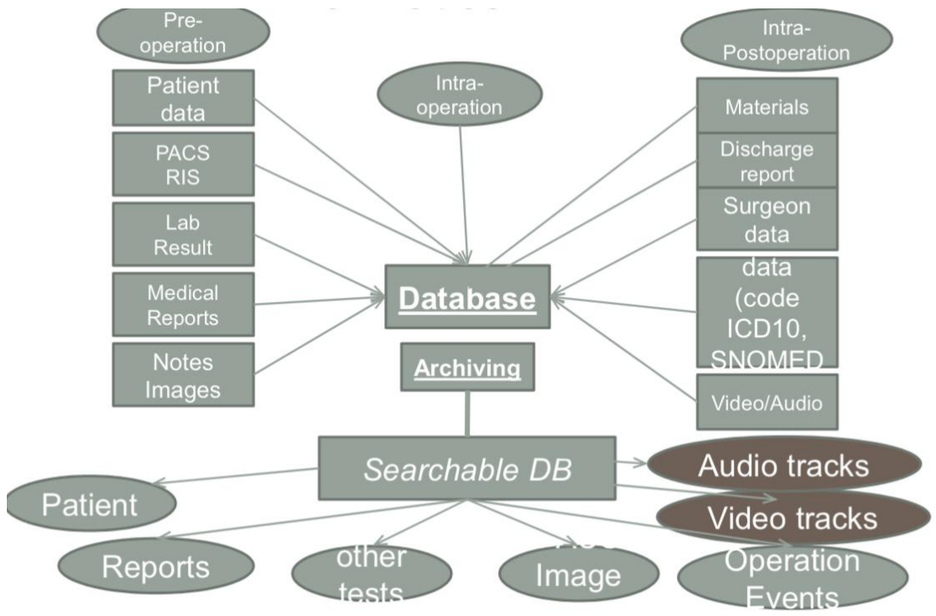












What is next?

KM research in healthcare

Among the most relevant areas to link with knowledge and research in health care are:

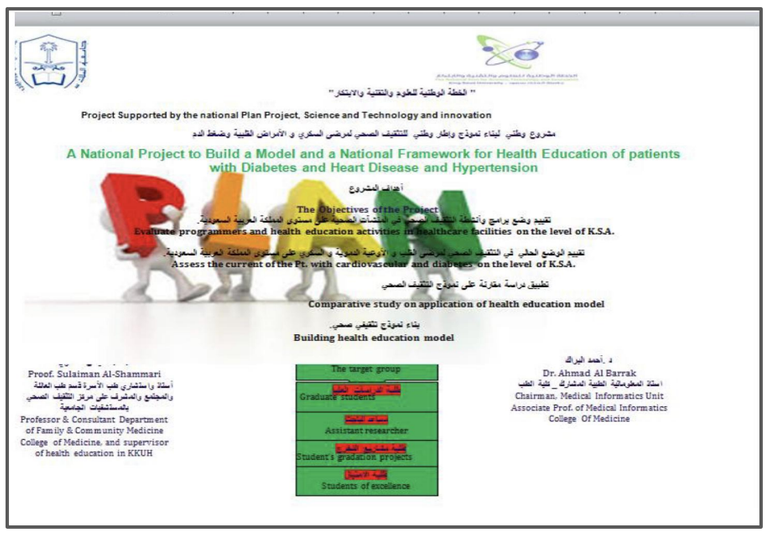
- Research, applying research results through access and utilization of knowledge
- Human resources management.
- Data mining.
- Machine Learning and Data Analysis.
- Probabilistic and Statistical Models.
- Symbolic Learning and Rule Induction Symbolic learning.

Areas of research in healthcare

- Evidence based medicine.
- Clinical decision support systems.
- Public health and epidemiology.
- Consumer public health.
- Data mining.
- Physiological modeling and simulation.
- Artificial intelligence.

Evaluation of the Effectiveness of a Structured and Interactive Patient Health Education Model in the Control of Chronic Diseases in Saudi Arabia

- Diabetes and cardiovascular diseases are a major cause of death and disability worldwide.
- The incidence of chronic diseases has increased in the KSA, and will continue to do so if no immediate actions are undertaken.
- Health education is an integral component of self management programs & an important element for control & management of chronic diseases.
- Patients involved have demonstrated better health outcomes and satisfaction, with reduced health costs.
- The widespread use and popularity of technology & communication infrastructures in KSA & globally, can be effectively utilized.
- Taking into consideration the available health information sources and patient preferences, information and communication technologies are well positioned to overcome most of the limitations around providing timely, convenient, accessible and interactive HE.

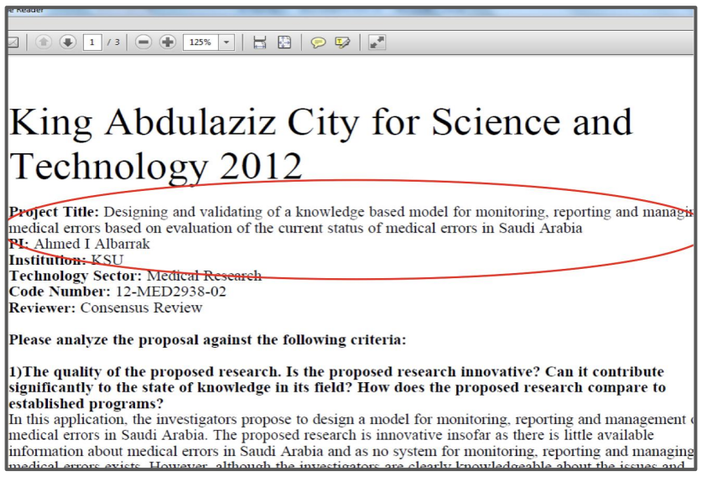


Project objectives

- To assess the current status of diabetes & cardiovascular disease-related patient HE programs and activities in various health care settings.
- To assess the current status of diabetes & cardiovascular disease-related patient HE, regarding knowledge, attitudes, practice, satisfaction and efficacy.
- To assess patient literacy, attitudes, practice and preferences with regard to technologies, i.e. text, audio, images, animation, video and interactive content forms.
- To design and validate structured HE models for patient with diabetes and cardiovascular disease based on the findings of the first three objectives; and
- To convert and assess selected validated HE models into interactive informatics materials.

Artificial Doctors and artificial intelligence in clinical practice

• Artificial Doctors is and will be much criticized. We'll see all sorts of press wisdom decrying "they don't work" or "look at all the silly things they come up with. However it is getting better and better and will go from providing "bionic assistance" to second opinions to assisting doctors to providing first opinions and as referral computers (with complete and accurate synopses and all possible hypotheses of the hardest cases) to the best 20% of the human breed doctors. And what's more?!!!



King Abdulaziz City for Science and Technology 2012

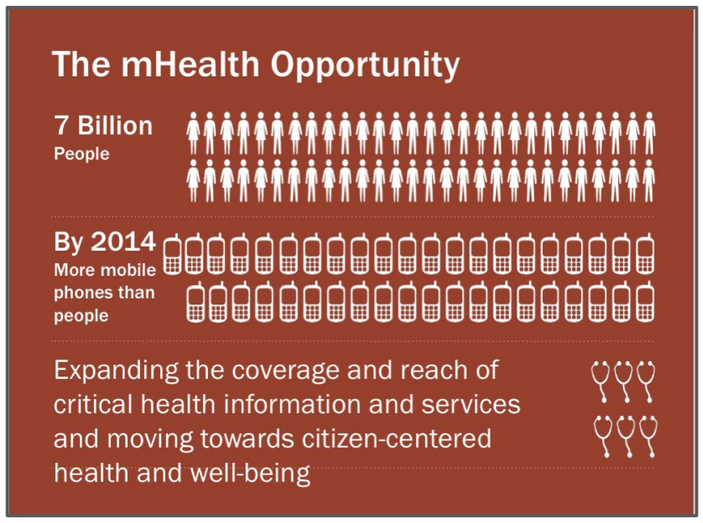
Project Title: Designing and validating of a knowledge based model for monitoring, reporting and managin medical errors based on evaluation of the current status of medical errors in Saudi Arabia
PI: Ahmed I Albarrak
Institution: KSU
Technology Sector: Medical Research
Code Number: 12-MED2938-02
Reviewer: Consensus Review

Please analyze the proposal against the following criteria:

1)The quality of the proposed research. Is the proposed research innovative? Can it contribute significantly to the state of knowledge in its field? How does the proposed research compare to established programs?
In this application, the investigators propose to design a model for monitoring, reporting and management medical errors in Saudi Arabia. The proposed research is innovative insofar as there is little available information about medical errors in Saudi Arabia and as no system for monitoring, reporting and managing

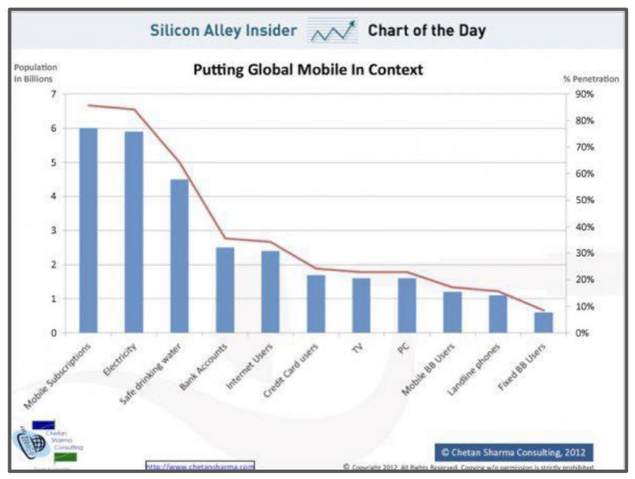
Applications and Examples

• Ford Motor Co. & Microsoft and health care start-up healthrageous to roll out a pretty interesting healthcare product: A car equipped to monitor vital signs and feed that data wirelessly into an electronic medical record to watch out for any abnormalities or warning signs. Or, as Ford describes the new product, it's a "doctor in your car."
• The prototype that Ford has shown off doesn't have the skills of a physician in diagnosing diseases (there is, however, another machine for that: IBM supercomputer Dr. Watson). But it does look like the kind of device that could support those diagnoses, a non-obtrusive way to capture a lot of health-care data that currently goes unmonitored.



Mobile health

• M-health or Mobile health is a term used for the practice of medicine and public health, supported by mobile devices.
The term is mainly used in reference to using mobile communication devices, such as mobile phones, tablets and PDAs, for health services and information.
The mobile Health is a sub-segment of eHealth,
• The mHealth market earned revenues of $230 million in 2010 and is estimated to reach $392 million in 2015 in USA, according to a new report from research firm Frost & Sullivan.



Home continuous care

• "Meadville Medical Center is using the remote vital signs monitoring program to improve chronic condition outcomes and ongoing care for patients after discharge from the hospital," Barry Bittman, MD, chief innovation officer at Meadville.
• "As part of our Community Care Network model, the Electronic House Call (EHC) solution will allow our clinicians to remotely monitor our patients' conditions and continue to coordinate their care after they leave the hospital," he adds. "Electronic House Call is designed for this type of program and includes the intuitive technology and rich feature-set we were seeking to support our continuous care objectives, our patients and our own clinicians."
• The EHC remote patient monitoring solution allows patients to return home, while providing for frequent updates of patient data to healthcare providers without a face-to-face visit, Bittman said.

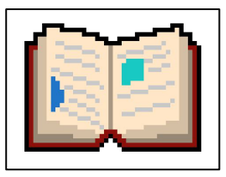
Mobile is the most Pervasive technology ever invented

Dr Watson the IBMs supercomputer

• The computer can analyze about 200 million pages of data in less than three seconds, which could allow physician to more accurately diagnose and treat complex cases.
Physicians could, for example, use Watson to consult medical records and the latest research findings for recommendations on treatment.
• FDA Approved?

Summary

- Data in context are individual facts that have meaning and can be readily understood. They are the raw facts wrapped with meaning, but they are not yet information.
- Knowledge is information that has been retained with an understanding about the significance of that information
- Best Example of the integration of Evidence Based Medicine (EBM) is when healthcare professionals can look up whether Their diagnosis is accurate in reference to a Scientific research.
- The Accenture Study After Surveying the group of doctors on Healthcare Information Technologies (HIT) Reached to conclusions that HIT made it Better access to Health Services and quality data to help clinical research and Patients and Improved coordination of care Also Reduction in medical errors.



Reference summary[438]

- **Clinical Research Informatics:** the sub-domain of biomedical informatics concerned with the development, evaluation and application of informatics theory, methods and systems to improve the design and conduct of clinical research and to disseminate the knowledge gained.
- ***Clinical Research***:
  - (1) ***Patient-oriented research***: *Research conducted with human subjects* (*or on material of human origin such as tissues, specimens and cognitive phenomena*) *for which an investigator* (*or colleague*) *directly interacts with human subjects. Patient-oriented research includes*:
    - (*a*) *mechanisms of human disease*;
    - (*b*) *therapeutic interventions*;
    - (*c*) *clinical trial*;
    - (*d*) *development of new technologies*.
  - (2) ***Epidemiologic and behavioral studies***.
  - (3) ***Outcomes research and health services research***.

Examples of focus areas in which CRI researchers and practitioners apply bio- medical informatics theories and methods can include the following:

- Evaluation and modeling of clinical research workflow
- Social and behavioral studies involving clinical research professionals and participants
- Designing optimal human-computer interaction models for clinical research applications
- Improving information capture and data flow in clinical research
- Leveraging data collected in EHRs
- Optimizing site selection, investigator and patient recruitment
- Improving reporting to regulatory agencies
- Enhancing clinical and research data mining, integration, and analysis
- Phenomic characterization of patients for cohort discovery and analytical purposes
- Integrating research findings into individual and population level health care

Clinical Research:

- **historical controls:** can be used for comparison with a group of subjects under study. For example, if a disease is known to have a particular fatality rate, subjects could be given a potentially life-saving treatment and their fatality rate can be measured and compared to past experience.
- **Randomization:**A more rigorous method of establishing comparison groups is through randomization , in which prospective subjects are assigned to different groups (often referred to as **study arms**) and undergo different interventions. Typically, randomization might take into account observable characteristics (such as gender and race) to create balanced groups, especially where the characteristics are known to have some influence
- **control intervention** (for example, the usual treatment for a condition or even no treatment) while one or more other groups receive an **experimental intervention**.

- For example, randomization can include **blinding**, in which the subject, the investigator, or both (as in **double-blinded** studies), are kept unaware of group assignment until after all assessments have been made. This might include the use of a **placebo** for a group receiving no treatment

Phased Randomised Control Trial

- It is important to note that clinical research endeavors exist on a spectrum of scientific activity that is commonly referred to as **clinical and translational research.**
- **T1-type translation:** a process by which **basic science discoveries** are used to design **novel therapies**. Such discoveries are then evaluated during clinical research studies, first pre-clinical and subsequent clinical trial phases.
- **T2-type translation:** involves methods such as those borrowed from implementation science and clinical informatics, and focus on translating the findings of such clinical research studies into common practice

preparatory phase: a protocol document is generated as part of the project development process. The protocol document usually contains background information, scientific goals, aims, hypotheses and research questions to be addressed by the trial

- IRB approval
- Deasable?
- Finding subjects… enrollment

Active phase: the participant receives the therapeutic intervention indicated by their study arm and is actively monitored to enable the collection of study-specific data.

dissemination phase: the results of the study are evaluated and formalized in publications or other knowledge dissemination media, for translation into the next phase of an RCT or into clinical practice.

Validity: One key metric used to assess clinical trial quality is validity, which can be defined both internally and externally.

- **Internal validity** is defined as the minimization of potential biases during the design and execution of the trial
- **External validity** is the ability to generalize study results into clinical care

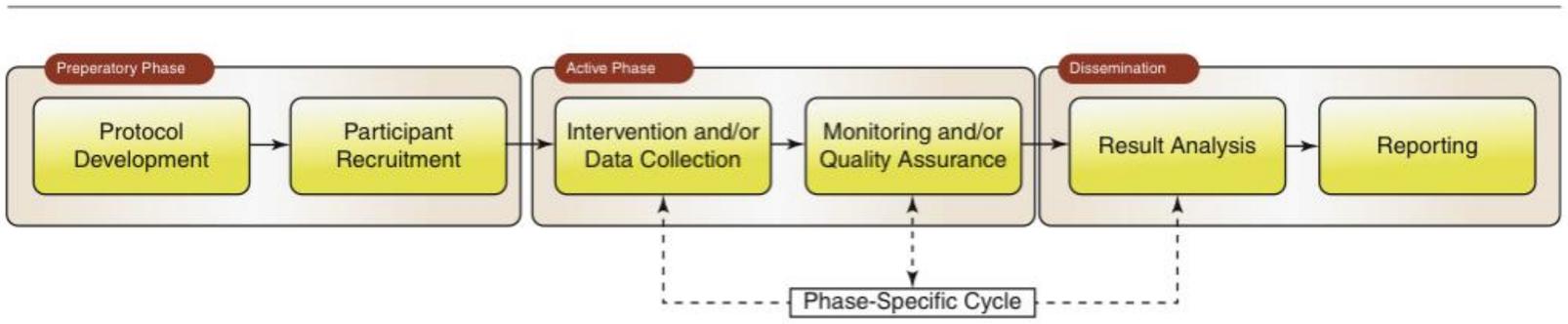
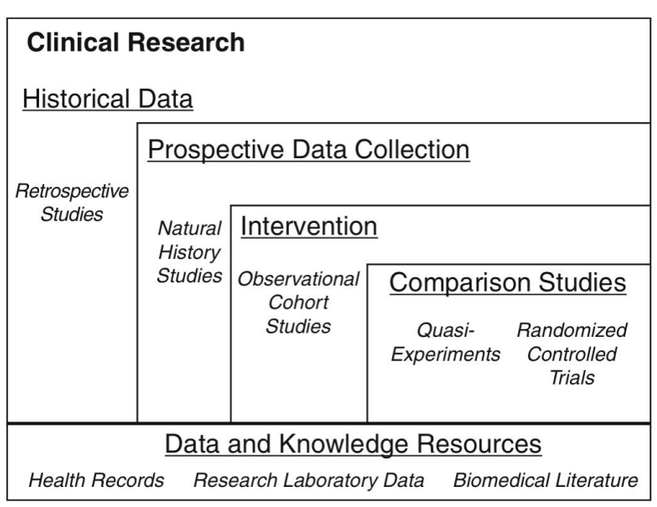
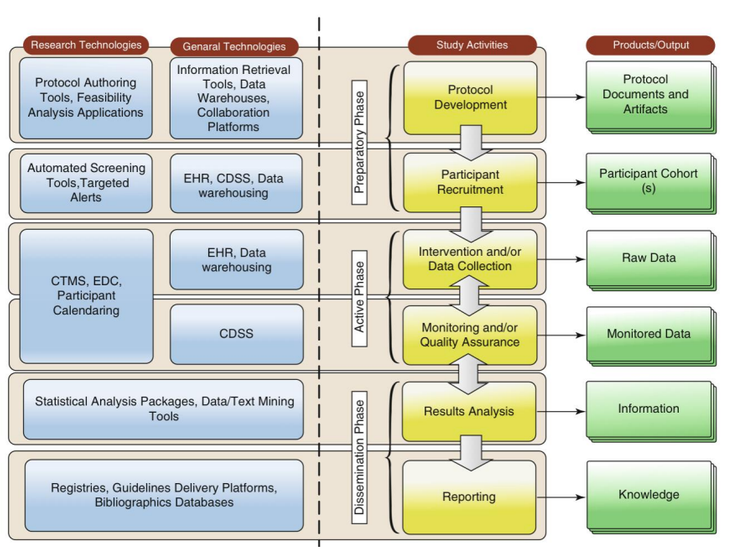


Fig. 26.2 Overview of the clinical research process for Phase I-III trials, divided into three major phases (preparatory, active, dissemination)





MCQs

1- Numbers, words or images that have yet to be organised or analysed to answer a specific question“ is the definition of

A- Knowledge
B- Data
C- Information
D- Research

2- “the integration of best research evidence with clinical Expertise and patient values” is the definition of

A-Clinical Datum
B- Evidence Based Medicine
C- Clinical Trial
D- Flood Information

3- The understanding and interpretation of information and its settings within a meaningful context” is the definition of

A- Knowledge
B- Data
C- Information
D- Research

4- A rapidly developing scientific field that deals with the storage, retrieval, and optimal use of biomedical information, data, and knowledge for problem solving and decision making” is the definition of which of the following?

A-Medical informatics
B-Health information system
C-Clinical decision support system
D-Simulation center

Answers key

1- B 2- B 3- A 4- A

FILE 1

INTERNE EXPLORE

RECYCLE BIN

MED439 King Saud University

Academic Leaders

Medical informatics 439

THE REFERENCE

EDITING FILE

FILE 2

Medical Informatics

Lecture 1

Lecture 2

Lecture 3

Lecture 4

Lecture 5

Lecture 6

Lecture 6.

Leaders

Norah alsheikh

Yasmine alqarni

Notetakers

Abdulrahman Alswat

Mohamed alquhidan

Members

Alaa Alsulmi

Ghaida Alassiry

Leena Almazyad

Rand AlRefaei

Shayma Alghanoum

Mohammed alsayyari

Hassan alshurafa

Raghad Soaeed

Nasser Almutawa

Sarah AlQuwayz

Bader Altamimi

Sarah Almuqati

Rania almutiri

Aljohara Alshathri

Bader Alrayes

Rana Alshamrani

Abdulaziz Alderaywsh

Samar almohammedi

Thank you all..!<3