

Training and its Impact on Hospital Information System (HIS) Success

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Abstract

A number of Hospital Information Systems (HISs) fail, because users are inadequately trained. The HIS led to many changes. Training is necessary for providers and staff to adequately learn how to use the new system and adapt them these changes. Unfortunately, often with inadequate training, the system usually does operate, but does not fulfill the original expectations. The aim of this study was to express the importance of users training to use successful HIS. This study was unsystematic-review study. The literature was searched on training and its impact to user satisfaction and HIS success with the help of library, books, conference proceedings, data bank, and also searches engines available at Google, Google scholar. For our searches, we employed the following keywords and their combinations: hospital information systems, user satisfaction, user dissatisfaction, success, succeed, user training, education, learning, user attitude, in the searching areas of title, keywords, abstract, and full text. In this study, more than 75 articles and reports were collected and 41 of them were selected based on their relevancy. A summary of background evidences, which are derived from primary studies that have been selected. The findings of this study showed there were existed some contributing factors that determine the success or failure of HIS and some factors that influence user satisfaction. The results emphasize that training is one of the key factors to achieve HIS success. Non-trained users fear to lose their job and resist the change. One of the solutions to decrease this barrier to fulfill the HIS is to involve users to design and implement new technology.

Keywords: Hospital Information System; Success; User satisfaction; User dissatisfaction; User training; Attitude

Introduction

Organizations of all types are seeking to improve their effectiveness and efficiency by using information systems. Considerable amounts of time and money are spent to develop and implement information systems within an organization [1].

Information technology (IT) has made a significant positive impact on the healthcare sector [2].

Hospitals are extremely complex institutions with large departments and units coordinate care for patients [3]. Hospital Information System (HIS) can be defined as a massive, integrated system, designed to store, manipulate, retrieve information of the administrative and clinical aspects [2,3], that support the comprehensive information requirements of hospitals [4], including patient, clinical, ancillary and financial management. Hospitals are becoming more reliant on the ability of HIS to assist in the diagnosis, management and education for better and improved services and practices [3].

The past decade has witnessed the foray of numerous information systems and their resultant products into the hospital scenario. The capital invested in electronic management facilities and types of hospital systems has increased substantially to replace previous paper medical records which are cumbersome in nature, bulky to use and difficult to manage, with digital records that are much easier to handle and improve the workflow efficiency by integrating various tasks [2].

The HIS is just one instance of health information systems, with a hospital as health care environment [3].

The HIS provides the required information to each level of the management at the right time, in the right form, and in the right place, so that the decisions to be made effectively and efficiently. The HIS plays a vital role in planning, initiating, organizing, and controlling the operations of the subsystems of the hospital and thus provides a synergistic organization in the process. The HIS improves patient care by assessing data and making recommendations for care and enables a hospital to move from retrospective to a concurrent review quality

and appropriateness of care [2]. The aim of HIS is to achieve the best possible to support patient care and administration by electronic data processing, to improve the quality and reduce the cost, to efficient delivery of high quality health services, to support health care services, and to knowledge based systems that provide diagnostic support and intervention for patient care activities [2,3,5]. The effective use of the HIS is to bring cost reduction and better patient care to the healthcare industry [6].

In health management systems, information has a special role in planning, evaluation, training, legal aspects and research [7]. In fact, the first distinction between developed and developing countries, are the production, application and utilization of information [8,9].

There is some contributing factors that determine the success or failure of the completion of IT projects including the development and implementation of the HIS [3].

The HIS is inevitable due to many mediating and dominating factors such as organization, people and technology (3). The HISs have lagged business and industrial information systems in the use of the IT and in the application of quality standards to customer satisfaction [10].

The HIS customers are classified into internal and external. Internal customers are physicians, nurses, laboratory technologists, pharmacists, quality department, and others within a healthcare

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facility that interacts with the essential processes. External customers are patients, patients' families, insurance providers, suppliers, health services researchers, etc. This research focuses on internal the HIS customers only; Commonly called users, they are more than simple users, they are customers of a system, a service, and information [10].

It is believed that the HIS implementation conducted within users. Neglect of any of these parties implies to miss related expertise, skills, knowledge, requirements and expectations. Expectation and requirement arise from what users see and hear about the system and interpret the ways the system will work for them [5].

This is particularly true in hospital environments where health personnel may be distrustful and even reject new technologies [10]. Consequently, the HIS may be underutilized by the users. More empirical investigations are being required to identify problem and weaknesses of the HIS for better understanding of the requirements for different types of the HIS users. If they are not satisfied of the system, they will not use it, or will not use it correctly and efficiently. The problems arise when users reluctant and having difficulties to use the system [3]. Studies indicated that addressing user expectation is a distinct element to ensure the successful adoption of the HIS [5].

It is important to measure how customers perceive their HIS and quantifies their satisfaction rather than evaluate technical aspects of the systems and to listen to the voice of customers rather than developers' voices. A "good" information system, perceived by its users as a "poor" system, is a poor system [10].

It is notable that a positive user attitude towards the IT can have beneficial influence on the system adoption [11] and one of the most important barriers of its implementation is attitudinal behavioral barriers [12]. Also adequate training to the end user will determine whether the implementations of a system would go smoothly or not [2].

The main aim of this study was first; to investigate the impact of training to create positive attitude among users, second, to identify user satisfaction for effective using of the HIS and result of it by training.

Methods

This study was non-systematic reviewed which the literature to assess the impact on training to meet HIS success. We used a sub-systematic method, which was divided into three phases: literature collection, assessing, and selection. Researchers identified studies which denoted the importance of users training on the users' satisfaction and positive attitude of users and also successful of the HIS implementation.

The literature search was conducted with the help of library, data bank, and also searches engines available at Google scholar. For our searches, we employed the following keywords and their combinations: hospital information system, user satisfaction, user dissatisfaction, success, user training, education, learning, user attitude, keywords or abstract. Technical reports were excluded since we focus on research papers. More than 75 articles were collected and assessed 41 of them were selected based on their relevancy. In this paper we first investigate, the factors affecting the success or failures of information system (include HIS) and looked at the impact of training to information system (IS) success in our review. Then, we repeated the same steps to investigate factors affecting users' satisfaction and users' attitude and impact of training on them. By analyzing the research prototypes, studies, and case studies in our collected literature, we implied the benefits and importance of user training on improving user attitudes, user satisfaction as well as its influence on the HIS success.

Results

Impact of training to success or failure of the HIS

There is some contributing factors that determine the success or failure of the completion of IT projects including the development and implementations of the HIS [3]. Historically focusing exclusively on the technology involved in implementing HIS has led to failure [13]. Lucas was one of the first researchers to debate the information system failure. He posed three classes of variables: user attitudes and perceptions, the use of systems, and user performance to describe his model of IS failure. Gradually this theory was developed and a failure category in term of "use failure"/ interaction failure/ user failure has been emerged; use failure arise because end-users neglect as a significant stakeholder group in a HIS project. Therefore, user need analysis and customizing HIS software with regard to user expectations provide the integral part of the HIS adoption [5].

The success of an IS can be measured at different life times of its implementation. According to the literature, IS implementation can truly be considered as a "success" when a significant number of users have moved from an initial adoption to using the IS on a continued basis. In fact, the lack of an IS continuous use is shown by previous research to be the main cause of failure for IS projects [14].

In another study mentioned: Successful implementation depends on many factors, one of which is how users respond to the new system [15].

Amin et al. [3], mentioned that people characteristics, training, and user involvement both at system requirements definition and project implementation are part of critical success factor in the HIS development.

According to Ribiere et al. [10], six major dimensions of the IS success were system quality, information quality, use, user satisfaction, individual impact, and organizational impact.

In a qualitative study that obtained views on information system development and implementation in three hospitals in Malaysia, interviews with personnel representing both the system providers and the end-users were done, The results of the interviews were categorized into few themes namely the system development, human resource, scope of implementation, support system, user-friendly, training, hardware and security. Quality human resource, good support system, user-friendly and adequate training of the end-user will determine the success of implementation of the HIS [2].

Other study, contributed to the identification of factors that should be taken into consideration when implementing the HIS in hospital and primary-care environments. Researcher pointed out that merely implementing an HIS will not automatically increase organizational efficiency.

Strategic, tactical, and operational actions had to be taken into consideration, including management involvement, integration with healthcare workflow, establishing compatibility between software and hardware, and, most importantly, user involvement, education, and training. Better understanding of the factors that influence the success of the HIS implementation may accelerate the HIS adoption [16].

The most effective factors on the HIS implementation were found as technological factors; usefulness, compatibility, user involvement and ease of use. These factors were followed by organizational factors; training and organizational commitment. The most important individual factor is also found as user's previous the HIS experience [17].

Gallivan et al. [18], mentioned that much of the prior information systems literature has assumed an underlying relationship between “facilitating conditions” for IT adoption (e.g., user training, technical support, resource availability) and employees’ technology use .

The success of the program (Implementation of an Obstetrics Electronic Medical Records (EMR) Module) is clearly a result of an experienced project team that started listening to the users and persevered. The project team and the experts systematically worked through a long issues list and implemented solutions. The team provided additional training and support at the time of greatest concern. Without the perseverance of the team, the application would have been rolled back and all of its benefits would have been lost [19].

In a case study of the model digital hospitals in China one of the main reasons behind the HIS success was its ability to secure high user acceptance rate. By providing comprehensive training courses and effective technical support, the hospital staff quickly learned to use the HIS system as a part of their daily routine. The collective Chinese culture also contributes by reducing the level of initial resistance and establishing a peer support network, which facilitates a much easier learning process for Hospital [20].

All interviewees conceded the existence of user dissatisfaction and rejection of the new technology at its initial transition stage, and regarded it to be one of the major barriers to the HIS’s successful adoption. The main reasons for the users’ resistance include reduction in work efficiency due to the unfamiliarity with computers and difficulties in typing. The strongest user resistance came from the old physicians with limited or no computer skills, which significantly increased difficulties for system dissemination across the organization [20].

Baus [13] in his literature found that there are two approaches taken to explore the barriers to successful HIS implementation. The first and most common of these approaches, is the analysis of critical factors important to the successful HIS which offer specific guidelines or formulas for implementation. The second approach, the socio-technical approach, is critical of offering specific formulas for success and treats such approaches as attempting to place healthcare systems within the standardized, predictable context of information technology systems. The socio-technical approach does not offer a formula for success, but instead strives to successfully implement HIS within what it deems a “politically textured process of organizational change.

Making use of both the critical factor approaches (focusing on usability, leadership, Organizational structure and changes, technology, and training and technical support) and the socio-technical approach, which is critical of focusing on specific factors of success and opts instead to uniquely examine each situation, may provide enhanced changes for successful the HIS implementation. A combination of approaches is most appropriate; one which takes into account the historic problems encountered in the HIS implementation and the uniqueness of each attempt at implementation [13].

As mentioned usability is one of the critical factors in successful implementation of the HIS. In this part of study he explained time, training, and/or monetary investments are also necessary for providers and staff to adequately learn how to use the new system. Time necessary to proficiently learn and use a HIS is sometimes the main obstacle to their successful implementation, and training and technical support is other critical factors in successful implementation of the HIS. He said that such healthcare IT cannot work without dedicated healthcare professionals who have had the opportunity to receive

the education and training necessary to use the HIS and more easily integrate it into their unique setting. Furthermore, follow-up training and on-site support are good steps to ensure that users, having differing levels of computer skill, become comfortable with the software and use it successfully. Historically, focusing exclusively on the technology involved in implementing HIS has led to failure [13].

Internal sources of technical assistance have a strong understanding of the individual comprehension levels, and would thus be better equipped to train providers and staff. Regardless of who makes themselves available to provide training and assistance, the assistance offered must yield good user understanding of the HIS and data entry into the system. Data entry within difficult-to-use HIS is a major barrier to successful implementation due some healthcare settings finding it too difficult to allocate the necessary time [13].

And final the socio-technical approach mandates that the HIS be focused on the health professionals using the registry. Users should be involved with the design of the HIS, which will in turn provide them with a better understanding of how the HIS works and how to use it to its fullest potential [13].

As was seen in both approaches user training has played critical role to success of the HIS.

Also Hurd in his study found that effective user training is extremely important to the success of any computer system [1].

It is notable that one principles according to “ISO 9241 Part 10” to evaluate a HIS is suitability for learning that is a dialogue supports the suitability of learning, if the user is accompanied through different states of his learning process and the effort for learning is as low as possible [21].

Impact of training to user satisfaction

Definition of user satisfaction: Satisfaction was “ultimately a state experienced inside the users head” and therefore was a response that “may be both intellectual and emotional”. stressed the importance of “user satisfaction” and considered it as the basic concept of information system evaluation that could not be ignored in any experiment [22].

Satisfaction in a given situation is a person feelings or attitudes toward a variety of factors affecting that situation [23].

End user satisfaction (EUS) is critical to successful information systems implementation. Today it is generally understood that IS failure is due to psychological and organizational issues rather than technological issues, hence individual differences must be addressed [24].

System usage and user satisfaction are widely accepted and used as surrogate measures of IS success [25] and often used as an indicator of user perception of the effectiveness of an IS and is related to other important constructs concerning systems analysis and design [26].

Since electronic business (e-business) utilizes enterprise applications, user satisfaction, as a surrogate measure of the IS or the IT effectiveness/success is also important for enterprise applications success [27].

Usefulness of a system is often measured by examining user satisfaction. User satisfaction has system-dependent aspects, such as content satisfaction, interface satisfaction and organization satisfaction, but also system-independent personal aspects such as individual dislike for computers [28].

Wong and Arjpru [14] in their study identified that the factors

that influence user satisfaction and the factors that influence user dissatisfaction over time in the use of an Information System and expressed knowing these factors provides an awareness to IS management. IS management need to have effective IS strategies to maximize user satisfaction and to avoid user dissatisfaction to increase the use of an Information System over time. This can be implemented by continually providing regular training with the updated knowledge of the system abilities in maximizing user job performance. The in-house development team should also continue developing/improving the system functions that can maximize user job performance and can support them in learning new knowledge and extending their skills. In addition, knowing that users are dissatisfied with the use of an Information System because their expectations are not met, urges IS management to continue providing user training and providing adequate support over time. This can also be implemented by showing an accurate picture for the abilities of the system prior to the use of the system and during the early use of the system.

The purpose of Aggelidis and Chatzoglou article was built further upon the existing body of the relevant knowledge by testing past models and suggesting new conceptual perspectives on how end-user computing satisfaction (EUCS) is formed among hospital information system users.

In literature they referred to an end user computing satisfaction (EUCS) instrument model was developed comprising 13 factors based on previous 39 factors (EUCS) model, which can be broadly grouped into three main dimensions: (a) information quality, (b) Employee Discount Program (EDP) staff and Services, and (c) User Knowledge or Involvement. Typical measures of Information Quality include accuracy, relevance, completeness, currency, timeliness, format, security, documentation and reliability. Measures of EDP Staff and Services mainly comprise staff attitude, relationships, level of support, training, ease of access and Communication. Finally, measures of Knowledge or Involvement mainly include user training, user understanding and participation [26].

In their study were decided that should also test an enhanced (expanded) version of Doll and Torkzadeh's model some constructs, concerning the system quality and service Quality. More specifically, these new constructs deal with: (a) the system processing speed, (b) user interface, (c) user documentation, (d) user training, (e) the support provided by the information department, and (f) the support provided by the maintenance company [26].

Rivière et al. [10], were looking at the customer satisfaction with different services delivered by the HIS, and how HIS personnel interact with the customer. That part was included the five following HIS satisfaction factors: HIS Personnel service/orientation – Processing of change requests – Maintenance (internal/external) – Degree of training – HIS Hot-line assistance. In the conclusion said best way to serve HIS customers is not by giving them what developers think they want, but rather what customers want. This type of survey makes visible some unexpected dissatisfaction problems that will not be easily detected otherwise.

Amin et al. [3], also expressed that "Satisfaction" is one of the HIS Evaluation criteria, towards increasing the quality level of HIS and Collaboration with the users, training and support by the technical personnel may well be feasible for future the HIS development methodology and implementation.

According to Al-Maskar study user satisfaction is a subjective variable which can be influenced by several factors such as system

effectiveness, user effectiveness, user effort and user characteristics and expectations. In this paper provided a clearer picture on the relationship between user satisfaction and all above factors. It was illustrated that users were significantly more satisfied with a system having higher effectiveness compared to a less effective system. And as users exert an increasingly greater effort to complete a given search task, it was very likely that their satisfaction decreased. And also it was expected that familiar users with the search topics would be more effective (and therefore more satisfied) than unfamiliar users [19].

According to one study, bi-variants and multivariate analyses showed that age, typing ability, ease of data entry and computer error as significant correlates with overall user response. These findings relating to users' reactions to various aspects of Electronic Medical Records (EMRs) should assist policymakers to recognize the causes of dissatisfaction with the EMR among medical receptionists at health centre clinics that may adversely affect its successful implementation and regular use, as well as the quality of care provided by the clinics. In summarize This study showed that medical receptionists' satisfaction with the EMRs depends on ease of data input and reduced computer error frequency [15].

In the study entitled "Assessing Users' Satisfaction through Perception of Usefulness and Ease of Use in the Daily Interaction with a Hospital Information System" was explored actual users' satisfaction, relation with age, previous experience, frequency of use of physicians and nurses.

Data of this study confirmed that the inconsistency of the relationship between perception of usefulness and age, and show "unfamiliarity with computers" as commonplace. On the other hand, it seems that the keystone for usefulness perception is the knowledge the users have of the system. An effort by the technical personnel in establishing a broader collaboration with the users, and in providing more exhaustive training and support may well be worthwhile [29].

In other related studies results showed that the effects of quality measures (system and information quality) of clinical decision support system and its support factors (top management, department support, and user training) on satisfaction factors (user satisfaction and information satisfaction) by using the information system success model of DeLone and McLean. In addition, two information quality factors (information reliability and decision supporting capability) and one supporting factor (departmental support) were significant factors influencing user satisfaction. The highest positive response on support factors was user training support (43.8%), followed by the related department support (43.2%) [30].

In one research the meta-analysis findings explained that there exists a significant positive relationship between "system usage" and "user satisfaction" (i.e. $r=0.2555$) although not very strong [25].

In one study in Korea to identified key management issues in hospital information systems and critical success factors in management, it was interesting to see one hospital that provides user training responded with "low" user satisfaction. Lack of qualified trainers or classes offers may be the cause [6]. In this study mentioned that the user satisfaction analysis of outpatient computerized physician order entry (CPOE) and admission-discharge-transfer (ADT) system users with user training showed consistent results that user were satisfied when hospitals provided user trainings to employees [6].

According to Morton [31] thesis, factors having the greatest impact on user satisfaction included organizational issues, clinical and professional issues, and technical issues (such as training and support).

Analysis revealed no significant correlation between adequate training and perceived ease of use, nor adequate training and perceived usefulness. This finding was surprising, considering the results found in the studies noted above, as well as a correlation observed between adequate training and management support. While training seems to be very important to physicians, it does not appear to have an overall impact on their attitudes. Most comments about training were focused on the format of delivery, rather than its adequacy. The positive correlation between adequate training and management support could indicate that physicians expect to receive sufficient training.

User-Centered Design (UCD) is a multidisciplinary design approach based on the active involvement of users to improve the understanding of user and task requirements, and the iteration of design and evaluation. It is widely considered the key to product usefulness and usability—an effective approach to overcoming the limitations of traditional system-centered design. Much has been written in the research literature about UCD. Our respondents believed that UCD would likely achieve even wider use and greater impact in the next five years. These findings indicate that UCD has already had an impact and is gaining increasing acceptance [32].

Yet the deployment of health IT alone is not sufficient to improve quality in health service delivery; what is needed is a human factors approach designed to optimize the balance between health-care users, health-care providers, policies, procedures, and technologies [33].

To avoid failure or underutilization of the system, continuous training is indispensable. In one study, training is compulsory for all users, which reduces technical problems resulted from misuse [2].

In one other study indicated that only 57.7 % of the users were satisfied with HIS. He presents user needs analysis as a valuable tool to enhance user satisfaction [5].

Hurd [1], in his thesis entitled “Evaluation of user information satisfaction of the composite health care system” found: The person’s satisfaction with the initial user training received sets the stage for his or her satisfaction while operating the system. Often, user training is intensive only during the time a system is being implemented. After implementation new users are frequently required to learn the functionality of a computer system with On-the-job-training (OJT). Formalized training programs are difficult to conduct on a regular basis due to the constant change-over of personnel experienced at medical treatment facilities and the specialized requirements of the different work groups. Satisfaction with the degree of training provided is closely associated with the user’s understanding of the system and their feeling of participation.

Impact of training to users attitudes and perceptions

A positive user attitude towards IT, IT-friendly environment and good communication can have beneficial influence on the system adoption [11].

In one study “User participation” is defined as the observable behavior of information system users in the information system development process; “user involvement” as a need-based attitude or psychological state of users with regard to that process and to the resultant information system; and “user engagement” as the set of user behaviors and attitudes toward information systems and their development.

In this study there was strong empirical evidence to support: 1. That user involvement is something distinct from, although associated with user participation; 2. That this psychological state of user involvement

may be more important than user participation in understanding information system success; 3. That the behavioral-attitudinal theory of information system success (i.e. that participation “causes” involvement which mediates the participation-success relationship) is superior to the behavioral theory (i.e., participation “causes” success); and 4. That user engagement during the installation phase is strongly associated with user satisfaction [34].

Hurd [1], implied that users generally attain a high level of understanding of a computer system from either effective training or experience or both and also expressed the user’s perception of the shared involvement and commitment to the operation of the computer system is beneficial to the success of a computer system.

It is notable that raising users understanding of the system requirements and benefits are important to ensure success [2].

Variables that were positively correlated with attitudes include computer literacy, system training, clinical specialty, occupation and job satisfaction. System complexity has been found to be negatively correlated with attitudes and gender traditionally has not impacted physician attitudes toward computer use.

Brown and Coney evaluated physician attitudes toward clinical information systems and found computer skills and experience to be predictors of computer acceptance. Age, gender and attitudes toward physician data entry were found to be no significant [31].

None of the HIS software products could completely meet the end users’ expectations in all fields. This may be a result of poor user participation in the designing process. So using a comprehensive approach based on organizational goals and workflow and user requirements seems necessary [35].

Lee in the article entitled “Nurses’ concerns about using information systems: analysis of comments on a computerized nursing care plan system in Taiwan” noted that hardware availability, content design and user training/education programmers are critical issues that affect nurses’ use of computers in their daily practice [36].

Holding educational workshops about the use of modern information technologies in effective management and presenting a feedback of the network performance with an approach on the analysis of cost-efficiency, cost-benefit and cost-effectiveness can help improve the current attitude among the users [37].

One researcher mentioned since the most important barriers of Electronic Health Records (EHR) implementation were attitudinal behavioral barriers and organizational change barriers, educational interventions seem necessary to create an appropriate attitude among health care providers. Increasing knowledge of system users about the features, objectives, benefits and positive effects of the system while ensuring the confidentiality and security of the EHRs would decrease change resistance and increase the acceptance and participation in EHR implementation [12].

As a result of other study, training and user participation are frequently suggested as possible ways of improving perceived usefulness among the healthcare professionals [20].

And in a case study of the model digital hospitals in China moreover user involvement facilitates smoother system implementation and better user acceptance extensive user involvement in the HIS adoption process was found to directly facilitate a smoother system implementation experience in that Hospital. By involving the end users in software development and system implementation, Hospital

is able to develop a system that is both useful and user-friendly to the end users. In addition, allowing the end user extensive participation in the system implementation stage, Hospital Alpha was able to forge a strong sense of ownership among end-users and hence improve user acceptance of the system. As observed during the interviews, all interviewees demonstrated great enthusiasm and pride towards their HIS system, and were eager to showcase their system functionalities of their own accord. Their positive attitude is instrumental in facilitating successful system implementation and assimilation [20].

Discussion

Information system management needs to have effective IS strategies to maximize user satisfaction and to avoid user dissatisfaction to increase the use of an Information System over time. This can be implemented by continually providing regular training with the updated knowledge of the system abilities in maximizing user job performance. The in-house development team should also continue developing/improving the system functions that can maximize user job performance and can support them in learning new knowledge and extending their skills. In addition, knowing that users are dissatisfied with the use of an Information System because their expectations are not met, urges IS management to continue providing user training and providing adequate support over time. This can also be implemented by showing an accurate picture for the abilities of the system prior to the use of the system and during the early use of the system [14].

Often with inadequate training and preparation, the system usually does operate, but does not fulfill the original expectations. The frustrated expectations and residual problems leave a general feeling of dissatisfaction [38].

Training has been identified as one of the key factors responsible for ensuring successful IT usage. Research has shown that training increases system usage and helps users to feel comfortable with its usage and thus indirectly increases its acceptance. It has also been empirically shown that training is strongly correlated with: (a) the system usage and the improvement of decision-making, (b) users' efficiency and effectiveness, (c) users' satisfaction [25], (d) users' positive attitude and (e) IS success.

Consequently, users' continuous training is a key determinant of the long-term viability of IS in a given organization. Unfortunately, training costs and tight implementation budgets can result in limited training prior to actual usage [26].

When training is readily, it is likely to be diffused more quickly within a system [31].

Concerns during early use facilitate adoption by providing individuals with ongoing education, training and everyday support.

A number of systems have failed because users were inadequately trained. Training must be designed to meet the needs of users (such as physicians); therefore, it is critical to get strong support of physician leadership of participation in training. In most cases, physicians prefer to be trained one-on-one by other experienced physicians. However, team-based training or staged training may be needed for complex systems. Training programs should educate people on how to use the system, plus address attitudes and build enthusiasm for doing so. Appropriate techniques, training and high-quality training materials are required for successful system implementation [31].

Therefore everybody who was to work with the computer should have received training as those staff members who did not attend training found using the computer system difficult.

Overall, the training of trainers was regarded as the best solution for building capacity on computer skills [39]. Follow up training was necessary, even though training manuals were provided for revision purposes and also training methods could best be utilized in computer related training to maximize a trainee's retention of material and transfer of learning noted, the use of hands-on training methods, especially behavior modeling, resulted in superior retention of knowledge, transfer of learning, and end-user satisfaction. Cognitive ability failed to be a good predictor of trainee success but a connection was established between training methodology, system use, and end-user satisfaction [40].

Conclusion

HIS play a significant role in providing quality healthcare services and reduce cost. There are many barriers to implement the HIS such as; rejection new technology by users, lack of involvement and participation user during the design and implementation of the system (this is commonly known as User-Centered Design, UCD), integration with healthcare workflow, and non-trained users. The results emphasize that training is one of the key factors to achieve HIS success. Non-trained users fear they would not be able to cope with the HIS and lose their job, and then they resist the change. One of the solutions to decrease barriers to fulfill the HIS is; first, to train users to make more familiar with the function and benefits of it, second, to involve more users in the implementation and facilitate the HIS needs, act as a protection against future complaints [41]. So hospital must have regular training programs to educate people on how to use the system, plus address attitudes and build enthusiasm for doing so. Appropriate techniques, training and high-quality training materials are required for successful system implementation and usage.

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