ISSN: 0976-3031

International Journal of Recent Scientific Research

Impact factor: 5.114

A SURVEY ANALYSIS OF THE USER'S PERSPECTIVE TO NEWLY IMPLEMENTED PACS SYSTEM AT DUBAI HOSPITAL

Saleh Ahmed Al Yafei., Mohamed M Abuzaid., WiamElshami., JaberAbdullah and Zarmeena Noorajan

Volume: 6 Issue: 9

THE PUBLICATION OF
INTERNATIONAL JOURNAL OF RECENT SCIENTIFIC RESEARCH
http://www.recentscientific.com
E-mail: recentscientific@gmail.com

Available Online at http://www.recentscientific.com

ISSN: 0976-3031

International Journal of Recent Scientific Research
Vol. 6, Issue, 9, pp.6251-6254, September, 2015

International Journal of Recent Scientific Research

RESEARCH ARTICLE

A SURVEY ANALYSIS OF THE USER'S PERSPECTIVE TO NEWLY IMPLEMENTED PACS SYSTEM AT DUBAI HOSPITAL

Saleh Ahmed Al Yafei[1]*., Mohamed M Abuzaid[2]., WiamElshami[2], JaberAbdullah[2] and Zarmeena Noorajan[2]

[1]Fatima College of Health Sciences
[2]University of Sharjah, Medical Diagnostic Imaging Department

ARTICLE INFO

Article History:

Received 06th June, 2015
Received in revised form 14th July, 2015
Accepted 23rd August, 2015
Published online 28st September,2015

Key words:

picture archiving, communication system, digital imaging, workflow, radiographic imaging.

ABSTRACT

The Picture Archiving and Communications System, commonly known as PACS, enables storage and visualization of digital radiographic images, such as X-ray, computed tomography, and magnetic resonance imaging. This study was aimed at assessing the acceptability of PACS among users at Dubai Hospital. Data was collected using survey questionnaire, which was distributed to 100 users and the response rate was 53%. The usefulness of the system is correlated with the availability of high-quality images, reduction in frustrations of using films and an improvement in their workflow. Further, 86% of the respondents reported that that PACS had introduced positive changes in their workflow and met their expectations. Thus, our survey revealed that users at Dubai Hospital had the positive impression about the implementation of PACS in the hospital because it improved their working conditions and functioning as a whole.

INTRODUCTION

Recent times have witnessed a rapid growth of information technology and medical imaging data management. PACS encompasses a host of technologies that facilitates acquirement, archiving, sharing, and retrieval of diagnostic digital images obtained using radiography, computed tomography (CT), magnetic resonance imaging (MRI), nuclear medicine, and ultrasound imaging devices (Pilling, 2003) .With a few years of its introduction, PACS has gained considerable popularity as an effective solution for the management of diagnostic imaging data.According to The Healthcare Information and Management Systems Society (HIMSS), and Annual Report of the USA's Hospital IT Market, 30% of American hospitals have adopted PACS or are in the process of doing so. The major advantage of using this system is essentially the transition from film-based systems to digital systems, thereby eliminating the need for film storage and reducing the associated costs(Fang *et al.*, 2006).Other advantages offered by this system are that it allows rapid diagnostic reading, decreases the number of rejected images, the number of images acquired, costs of filming, and related financial loss; and increasing in the number of patients examined.In addition, it can decrease the time required for needed to prepare and submit results and reports, thereby offering considerable clinical, operational and financial benefits in the long term that may not only be attributed directly to the implementation of PACS but also the indirect changes in the organizational processes and the associated improvement in the people's skills. Further, PACS represents the key solution to reducing waiting lists and the number of lost diagnostic imaging data. Concerning the impact of PACS on the average duration of hospitalization, opinions are classified. For instance, some researchers confirmed an associated reduction in the length of hospital stay, while others researchers have not observed this change (Shile *et al.*,1993) (Watkins J1 *et al.*, 2000) disagree with them.

PACS comprises four main components at the basic level: (1) image acquisition devices, (2) display workstations, (3) storage systems, and (4) a computer network. Through the PACS systems, electronic images and reports can be viewed and shared among staff members, thereby creating a cost-efficient and user-friendly environment for both patients and hospital

Corresponding author:* **Saleh Ahmed Al Yafei
Fatima College of Health Sciences

employees. As a result, many hospitals worldwide have installed PACS and found the system to be an efficient and effective way to smoothen the processes in clinical practices and improve the productivity of staff and quality of healthcare provided. On the other hand, some disadvantages of the PACS have also been highlighted in a number of reports: these drawbacks are mainly regarding the need for training the staff, variability in image quality, and technical failure to log into the system (Morishita *et al*., 2005).

In the last few years, several hospitals across UAE have implemented the PACS system. This study aims to assess the acceptability among users of PACS and to maximize satisfaction. Dubai hospital is a 677-bedded hospital in Dubai, United Arab Emirates, which established in the year 1983. The Radiology Department of Dubai Hospital became fully digitized and PACS was installed in November 2008, replacing the old mini-PACS system (Centricity) which covers all the department modalities (cathode-ray, CT, MRI, and nuclear medicine imaging. The system was installed under AGFA company contract (IMPACT System), who are in charge of the regular maintenance and calibration of the system.

MATERIALS AND METHODS

The study has was conducted at Dubai Hospital between March and April 2012. A survey questionnaire was used to collect data for this study. The questionnaire comprised nine questions that measured the user's satisfaction on a 5-point scale with grades ranging from 1 'strongly agree' to 5 'strongly disagree'. In addition to the questionnaire, the survey participants were provided an attached consent form that explained the purpose, process, and benefits of the study and assured the anonymity and confidentiality of the respondents. The respondents were required to return the completed questionnaires within two weeks of receiving them. This self-administered questionnaire was distributed among a total of 100 users, including accident and emergency physicians, surgeons, pediatricians, anesthetists, radiologists, and radiographers. After completing the data collection, the responses from the questionnaires were entered into the analysis files and data were rechecked for accuracy and missing values before commencing the analysis. Microsoft Excel 2007 was used to analyze the data. The results are represented as frequency and percentages for the statistical calculations during data analysis.

RESULTS

Among 100 staff members at Dubai hospital, the questionnaire was divided, and the response rate was 53%. The number of respondents and their respective job titles is presented in Table 1.

Table 1 Respondents according to job title

Type	No	%
Radiology Technologist	22	41.5
Radiology Radiologist	8	15
Physicians	23	43.5
Total	53	100

From radiology technicians, the maximum responses were obtained. In fact, this group comprised the majority of the respondents. It is because radiology technicians may be the most frequent users of the system.

The responses of the users to each item in the questionnaire is provided in details in Table 2.

The results were very encouraging, with 81% of the respondents agreeing strongly and 18% agree that PACS had been a useful advance for the hospital. These results are similar to those of a previous study conducted in Norfolk and Norwich University Hospital, UK. The users reported that PACS was a useful advancement for the hospital, with 71% of the respondents strongly agreeing and 26% agreeing to its usefulness. The main reasons that seem to make the PACS an attractive tool are the decrease in the loss of images, reduction in the need for repeat Radiographs, and ready availability of the previous images for comparison.

The users' opinion regarding the quality of the hardware used for the Image Review Workstations. The responses indicate that the image quality was good, with 77% of the respondents reporting that the image quality was excellent and 19% reporting that the quality was very good.

The availability of radiology reports alongside the images was considered as a very useful aspect of the PACS by the majority, with 97% of the respondents scoring 1 or 2 for this item. For many staff members, the availability of a report is as important as the availability of the images themselves. A system that allows for the simultaneous viewing of both would be considered as greatly useful, making this advantage a key strength of the PACS.

Responses to Questions 4&5 were provided only by physicians as it pertains to the satisfaction of using PACS during ward rounds and whether and how PACS improved patient consultation. A majority (86%) of the physicians responded that PACS has improved their consultation by enabling them to show the patients their images (scoring from 1 to 2).Almost (95%) all the physicians agreed that the use of PACs reduced the time spent in finding the patient's images. As was the case with the previous sub-item, most physicians (90%) found the time to find the patient's radiology reports had greatly reduced. Nearly all (90%) of the respondents agreed that the consultation with patients had become more efficient with the use of PACS. It meant that physician satisfaction regarding consultation had improved with the PACS. Moreover, the percentage of physicians who were satisfied with the PACS in this study (90%) was greater than that recorded in a previous study (73%) conducted five years ago.

Question 5 aimed at exploring the changes brought about by the use of the PACS had impacted consultation during the ward rounds. The responses of the physicians indicate that the implementation of the system had a widespread effect, and most clinicians felt that the system had changed the manner in which the ward rounds were done.

Table 2 Picture archiving and communication systems (PACS) questionnaire results

		1	2	3	4	5	
1	PACS is a useful advance for the hospital	43	10	0	0	0	53
	Percentage	81,13	18,87	0	0	0	
2	How do you rate the quality of the images on the Image Review Workstation?	41	10	1	1	0	53
	Percentage	77,36	18,87	1,89	1,89	0	
3	How useful is it to have radiology reports on PACS?	43	9	1	0	0	53
	Percentage	81,13	16,98	1,89	0	0	
4	Has PACS improved your consultation						23
	a) By helping to show patients their radiology images?	15	5	3	0	0	
	Percentage	65,22	21,74	13,04	0	0	
	b) By reducing the time spent finding images for review?	18	4	1	0	0	
	Percentage	78,26	17,39	4,35	0		
	c) By reducing the time spent finding radiology reports?	19	2	1	1	0	
	Percentage	82,61	8,70	4,35	4,35	0	
	d) By making consultations more time efficient?	17	4	1	1	0	
	Percentage	73,91	17,39	4,35	4,35	0	
5	What change has PACS made to the conduct of ward rounds? A) By changing the way, Ward rounds are conducted?	22	0	1	0		23
	Percentage	95,65	0	4,35	0		
	b) By making it more difficult to review images during award round?	3	0	6	0	14	
	Percentage	13,04	0	26,09	0	60,78	
	c) By forcing a change in the wayward rounds are conducted						
	PACS has had an impact.	11	0	8	0	4	
	Percentage	47,83	0	34,78	0	17,39	
	d) By making changes in the way images are reviewed at the beginning of a ward round, the ward round itself is conducted more						
	efficiently.	20	0	0	0	3	
	Percentage	86,96	0	0	0	13,04	
6	Has PACS caused you more or fewer frustrations than using film percentage	48 90,57	0	23,77	0	35,66	53
7	Has PACS improved your professional life?	48	0	3	0	2	53
	Percentage	90,57	0	5,66	0	3,77	
8	To what extent has PACS changed your working practices?	46	0	3	0	4	53
	Percentage	86,79	0	5,66	0	7,55	
	To what extent has the introduction of PACS met your						
9	expectations?	46	0	3	0	4	53
	Percentage	86,79	0	5,66	0	7,55	

While a few responding physicians felt that reviewing the images was more difficult (13%) than before, most (61%) felt that PACS made it easier to view images while conducting the ward rounds. Most respondents (86%) felt that viewing images at the commencement enabled a more efficient ward round than before. It was probably because many computers stations are now available in each ward for use during the round. Overall, our results regarding this issue were consistent with those reported previously by Pilling (1), although our results were slightly better.

When comparing the ease of using the PACS system against the use of films was done; the responses showed that 90% of the clinicians preferred PACS to films and found it much less frustrating. One of the proven benefits of PACS is the reduction in user frustration because of the instant availability of images and elimination of the need for physically handling films and film packets. Compared to the percentage of users reporting a reduction in frustration reported previously (74%), the percentage noted in this study has improved (90%). It might be possibly due to the increase in staff confidence in using the system with continued use.

90% scored 1 to 2, which showed that the use of the PACS improved the working conditions of several staff groups.

With respect to working practices, the majority of staff groups reported PACS resulted in a significant change in their working practices, with 86% of the respondents scoring 1 to 2.

The most common reasons attributed to this change were improved access to images, ability to discuss the images over the telephone since the images can be accessed from multiple locations simultaneously, improved time management and the elimination of the possibility of losing images. The degree to which the expectations of the clinicians had fulfilled was assessed. The responses showed that the majority (86%) of respondents scored between l and 2 indicating that PACS strongly met their expectations and this percentage is an improvement from that reported previously (76%) (1).

Table3 Comments regarding PACS by users

Comment	No. of comments
Login problems/ integration between systems (PACS, HIS, RIS)	4
Difficulty to retrieve (offline)old images	5
System failures problems/can't log on	9

Table 3 shows the comments of the users regarding the use of the PACS system. The most common issues are regarding the system failure and problems during login. Other concerns was the difficulty in retrieving old offline images and the lack of integration between the Hospital Information System (HIS), the PACS, and the RIS, which makes it necessary for the users to log into each system separately to view all the patient data and reports.

DISCUSSION

The responses of the users to the implementation of PACS across the entire hospital indicate that most users believe that

the system is a positive technological advancement for the hospital. Their positive response was mainly due to the ready availability of good quality images alongside reports. The users also felt that the application of the system had improved the manner in which consultation was done during both, the outpatient visits of the patients and ward rounds. Most respondents reported a reduction in the frustration associated with the handling of diagnostic digital images, which resulted in better-working conditions and met the expectations of an efficient data management system. The perceived benefits of using the PACS considerably outweighed the disadvantages, and the results of this investigation were in agreement with the reports of the benefits of PACS that have been widely discussed in the literature worldwide.

CONCLUSION

In conclusion, further annual studies are necessary to enable a long-term evaluation of the benefits of the system and clearly identify any problem areas so as to develop effective strategies to address them. On the basis of the findings in this study, we put forth the following recommendations:

- A system should be developed for the integration of the various systems, including the PACS, HIS, and RIS.
- Rather than providing the use of stationary workstations for the staff, it may be more beneficial to provide portable devices with the wireless connection; the availability of this device may improve ward round conduct.
- Another step that can be taken to ensure that patients receive continued medical attention is to implement measures to establish a system to connect Dubai Health Authority (DHA) hospitals with other hospitals.

References

1. Barthel, J., and Gores, H.J. 1994. Solution Chemistry: A cutting edge in Modern electrochemical 1) Pilling, J.R. (2003) 'Picture archiving and communication systems: the users' view', *British Journal of Radiology* 76(908), pp. 519-524
2. Fang, Y.C., Yang, M.C. and Hsueh, Y.S. (2006) 'Financial assessment of a picture archiving and communication system implemented all at once', *Journal of Digital Imaging* 19 pp. 44-51.
3. Shile, P.E., Kundel, H.L., Seshadri, S.B., Carey, B., Brikman, I., Kishore, S., Feingold, E.R. and Lanken, P.N. (1993) 'Assessing the impact of PACS on patient care in a medical intensive care unit', Medical Imaging 1993 : Pacs Design and Evaluation 1899 pp. 423-431.
4. Watkins J1, WeatherburnG, Bryan S. The impact of a picture archiving and communication system (PACS) upon an intensive care unit. Eur J Radiol. 2000 Apr; 34(1):3-8.
5. Morishita J, Katsuragawa S, Kondo K, *et al*. An automated patient recognition method based on an image-matching technique using previous chest radiographs in the picture archiving and communication system environment. Med Phys. 2001; 28:1093–1097.

****

How to cite this article:

Saleh Ahmed Al Yafei *et al*.(2015). A Survey Analysis of the user's Perspective to Newly Implemented Pacs System at Dubai Hospital. *Int J Recent Sci Res,* 6(9), 6251-6254.

International Journal of Recent Scientific Research

ISSN 0976-3031