المجلة الإلكترونية الشاملة متعددة التخصصات
العدد الرابع و الخمسون شهر (١٢) ٢٠٢٢

THE PERCEPTION OF RADIOLOGY STAFF ABOUT THE IMPACT OF PACS ON THE QUALITY OF THEIR WORK IN KING KHALID GENERAL HOSPITAL IN HAFR AL-BATIN.

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This work was carried out in collaboration among all authors. All read and approved the final manuscript

ABSTRACT

Background: The primary aim of this research is to investigate the effect of picture archiving and communication system (PACS) on staff members in the radiology department at King Khalid general hospital, Hafr Al-Batin., Saudi Arabia.

Methods: This quantitative, descriptive cross-sectional study will be conducted at King Khalid general hospital radiology department in Hafr Al-Batin. All staff members who are utilizing PACS in their duties during the study period will be included. A total of 50 personal will be approached to participate and answer electronically through a self-administered survey tool. The questionnaire will be obtained from (Aldosari et al., 2018) which was based on the work of (Kaplan and Duchon, 1989, Kaplan and Duchon, 1988) to examine five interrelated variables; External Communication, Service Outcomes, Personal Intentions, Personal Hassles, and Increased Blame. Descriptive statistics, Pearson's correlation, and Anova will be used to analyze the data which will be presented in tables to assist in organizing the data.

Results: The research suggests that staff members have positive perception towards PACS. A statistically significant relationship between user characteristics and the five variables; External Communication, Service Outcomes, Personal Intentions, Personal Hassles, and Increased Blame.

Keywords:

PACS, radiology, external communication, service outcomes, personal intentions, personal hassles and increased blame

Chapter 1

1.Introduction

The key goal of The Kingdom of Saudi Arabia's vision of 2030 aims toward digital transformation in all areas, including health care. Modern technologies have played a vital role in our daily lives, and even more so in healthcare. In particular, healthcare is becoming more digital numbered and aiming for a paperless milieu to facilitate their work (1). Systems such as the hospital information system (HIS), radiology information system (RIS), picture archiving communication system (PACS), clinical information system (CIS), and electronic health record (EHR) are the complementary components of a hospital. It is essential that these systems complement each other to ensure that the patient's health records are complete, correct, and up to date (1). More specifically, picture archiving and communication systems (PACS) have become an integral part of our modern healthcare field to improve the quality and efficiency of healthcare systems. PACS which is designed specifically for the radiology department can be defined as "a medical image management information system which manages medical images and integrates equipment through a network" (2, p. 1). Systems such as PACS allow staff members including technologists, image library personnel, radiologists, physicians/clinicians, and nurses to store, transmit, retrieve, and display digital images in different locations of a hospital or health system (3). PACS usage in healthcare setting offers numerous benefits including the potential to "improving operational efficiency, and productivity of the medical image system, facilitating accessibility of images anytime and anywhere, reducing waiting time for imagery retrieval and turn-around times of clinical reports, and more effective application of radiology equipment" (3, p 1-2).

1.2 Research Question(s)

What is the perception of healthcare professionals, working in radiology department in King Khalid General Hospital in Hafr Al-Batin., about the effect of PACS on the quality of their work?

1.3 Specific Aim

The primary aim of this research is to explore the perception of health care professionals dealing with picture archiving and communication system (PACS) in the radiology department at King Khalid general hospital, Hafr Al-Batin., Saudi Arabia. Recommendation will be made that if adopted should improve the quality of care provided to the patients.

1.4 Objectives

To understand the effect of PACS's on its users based on five interrelated variables; External Communication, Service Outcomes, Personal Intentions, Personal Hassles, and Increased Blame.

1.5 Literature review

PACSs are a well-known imaging informatics application in health care organizations dedicated for the radiology department. Employing PACS in hospitals entail innumerable benefits at various levels (3, 4). According to Buabbas, Al-Shamali (4) the technology enhances productivity, as all tasks are performed digitally and swiftly; at the clinical level, image interpretation and diagnosis become more precise and accurate." (1). Many of the aforementioned benefits will significantly influence an area such as radiology department. The PACS-based studies tend to focus on investigating users' acceptance of this healthcare

technology (2-4) but limited research exists examine staff members' perceptions regarding the effect of PACS on the quality of their work within the Saudi Arabian context (1, 5).

Aldosari (2), measured the acceptance level of the PACS by staff in the radiology department. The result of the quantitative study showed that all three constructs of perceived usefulness (PU), perceived ease of use (PEU) and change have significant effect on users' PACS acceptance. More specifically, perceived usefulness is the most significant predictors of radiology staff PACS acceptance in which they reported that PACS system have improved the quality of their work in providing better patient care. The study by Goodarzi, Khatami (3) showed similar result with the study carried out by Aldosari (2) that the three constructs of PU, PEU and change were statistically significant in influencing PACS acceptance. However, change variable was the most statistically significant predictors in PACS acceptance level. Buabbas, Al-Shamali (4) study examine PACS in hospitals to ascertain the critical success and failure of such technology. The result of the study showed that staff members from radiology department rating PACS positively and as user friendly. This result was supported by administrator's statement that PACS has benefits to staff members. Buabbas et al. (2016) suggested that there is a need for developing a unified policy aimed at streamlining and improving the departmental workflow. The study by Aldosari et al. (2018) conducted a study to assess the impact of PACS's on radiology staff from their perspective. The results showed that radiologists held a positive stance toward PACS, thus positively affecting their work efficiency and productivity. To increase radiology staff, use of PACS, Aldosari et al. (2018) suggested that leaders in the healthcare domain should include "the users in any decision making related to PACS in order to maintain continuity in user satisfaction within the radiology department" (6).

Despite the fact that PACS is becoming a popular system in healthcare organizations there are "some challenges in implementing and using this technology like necessity to make changes in the workflow, cost, and users' resistance to accept the technology." Therefore, the purpose of the present study was to explore the perception of health care professionals dealing

with picture archiving and communication system (PACS) in the radiology department at King Khalid general hospital, Hafr Al-Batin., Saudi Arabia

Chapter 2

2. METHOD

2.1 Study Setting

The study was conducted at King Khalid General Hospital in Hafr Al-Batin. city, Saudi Arabia. The hospital is the first specialist hospital in the north of Saudi Arabia with 55 various clinics in 48 specialties. The Radiology Department is an essential department that needs to be improved by integrating the PACS system due to the importance of radiology in the hospital.

Table 1. King Khalid General Hospital ’s profile

Categories	No.
Hospital beds	500
Hospitalized patients	100
Physicians	4
Radiologists	20
Radiology technologists	25
PACS administrators	1

2.2 Participants

The target population includes all staff members working in the radiology department at King Khalid General Hospital and who are utilizing PACS in their duties during the study period. Staff members who do not utilize PACS in their daily work routine was excluded. There were no specific criteria for any variable as well. Staff members required to answer electronically through a self-administered survey tool. A total of 50 personnel approached to participate and answer electronically through a self-administered survey tool.

2.3 Study Design

The present study was designed as a quantitative, descriptive cross-sectional analysis of responses collected from a set of participants. The survey approach was used as a method of data collection to investigate PACS effects from radiology staff members perspective on five inter-related variables. Examining the Radiologists response of interrelated variables including (External Communication, Service Outcomes, Personal Intentions, Personal Hassles, and Increased Blame) would help us to gain more insight on the effect of PACS on staff members. The study design was the most appropriate since the study intends to gather information and build foundation to answer the research questions.

2.4 Data Collection

The questionnaire obtained from (1) which was based on the work of (6, 7). The researcher validated the modified instrument by given it to four colleagues for review including: two radiologists, a laboratory technologist, and a pharmacist with work experience in health information systems within and outside KAMC. The questionnaire consisted of six parts. The first part includes 8 questions about respondent characteristics such as gender, age, experience with PACS, title, training, and computer knowledge. The second part contains 25 questions

related to five interrelated variables that describe the health information system's impact of utilizing PACS in their duties. These included: (1) a 3-item questionnaire on external communication; (2) six-item questionnaire on service outcomes; (3) a 2-item questionnaire on personal intentions; (4) a 7-item questionnaire on personal hassles; and (5) a 7-item questionnaire increased blame. The responses were recorded on five-points Likert scale: Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). Data was collected from staff members electronically through a self-administered survey using Survey Monkey from March 2nd, 2020 till March 20th, 2020. All potential study participants received a link to the closed, structured survey via WhatsApp.

2.5 Statistical Analysis

The participants in this study were 41 staff members from radiology department, which is 82.00% of the collected survey responses after excluding nine with incomplete responses. The process of analyzing the data began after collecting the 41 survey responses. Descriptive statistics were used to report the demographic information of the study participants. Also, the mean and standard deviation for each variable was calculated. The software used for data entry and statistical analysis was the Statistical Package for Social Sciences (SPSS 22).

2.6 Ethics approval

Before the start of the study, approval was obtained from King Khalid General Hospital in Hafr Al-Batin. and the University's Review Board (IRB). The survey included a cover letter stating the purpose of the research, its completion instructions, and confidential data. Completing

the study means consent. There was no risk for the study participants. All surveys were kept with the researcher in a closed drawer in a closed office and on a password-protected computer.

Chapter3

3.RESULTS

Sample Characteristics

Table 2 presents the demographic information of the participants. Of the 41 participants 39.02% were female while the male participants were 60.98%. The age variable shows that 48.78% of the participants were under 30 years old, and 51.22% were aged between 30 and 39 years. About 34.15% of the respondents with 5-10 years of PACS experience, 29.27% had 1-4 years of PACS experience, 19.51% had more than 10 years, and 17.07% had less than one year of PACS experience. The area of work in the radiology department were General Radiology (48.78%), Computed Tomography (19.51%), Magnetic Resonance Imaging (7.32%), Ultrasound (12.20%), Angiography (2.44%), and Other (9.76%). Under the job title, the main group of the respondents were Supervisor (56.10%), followed by Radiologist (31.71%), Technologist (9.76%), and administrative (2.44%). As for the training staff members received on the PACS, 43.90% trained with group, 39.02% trained individually (one-to-one training), 7.32% trained using web-based tutorial training, and 9.76% revealed that they had no formal training on the PACS.

As for the training staff members received on the PACS, 43.90% trained with group, 39.02% trained individually (one-to-one training), 7.32% trained using web-based tutorial training, and 9.76% revealed that they had no formal training on the PACS. Over 53.66% of the participants rated themselves as average user having good grasp of computer knowledge without previous training or education in computer use, while, 29.27% were advanced user having great computer knowledge with some prior training or education in computer use. 9.76% were expert

with advanced knowledge in computer use, and 7.32% were beginner user with minimal computer knowledge and experience. Half of the participants responded that they had less than 2 years of experience using the PACS, while 26.83% had experience between 2-5 years, 24.39% had experience between 5 to 10 years.

Table 2

Table 2. Respondents' Characteristics

PACS User Characteristics	No (N = 41)	Response Percentage
1. Gender		
Female	16	39.02%
Male	25	60.98%
Total	41	100%
2. Age (years)		
Under 30 years	20	48.78%
30 to 39 years	21	51.22%
40 to 49 years	0	0.00%
50 years or older	0	0.00%
Total	41	100%
3. Radiology Department Experience (years)		
Less than 1 year	7	17.07%
1-4 years	12	29.27%
5-10 years	14	34.15%
More than 10 years	8	19.51%
Total	41	100%

4. Area of Work within The Radiology Department		
General Radiology	20	48.78%
Computed Tomography (CT)	8	19.51%
Magnetic Resonance Imaging (MRI)	3	7.32%
Ultrasound	5	12.20%
Nuclear Medicine	0	0.00%
Angiography	1	2.44%
Other (please specify)	4	9.76%
Total	41	100%
5. Position or Job Title		
Radiologist	13	31.71%
Supervisor	23	56.10%
Technologist	4	9.76%
Administrative	1	2.44%
Physician	0	0.00%
Other	0	0.00%
Total	41	100%
6. PACS Training		
I was trained within a group	18	43.90%
I was trained individually (one-to-one training)	16	39.02%
I was trained using web-based tutorial training	3	7.32%
I have not been trained	4	9.76%
Total	41	100%

7. Computer Knowledge and Education		
Novice (beginner) user with minimal computer knowledge and experience	3	7.32%
Average user who have good grasp of computer knowledge without previous training or education in computer use	22	53.66%
Advanced user who has great computer knowledge with some prior training or education in computer use	12	29.27%
Expert user with advanced knowledge in computer use	4	9.76%
Total	41	100%
8. Experience Using PACS (years)		
Less than 2 years	20	48.78%
2 to 5 years	11	26.83%
5 to 10 years	10	24.39%
More than 10 years	0	0.00%
Total	41	100%

a. PACS impact variables from users' perception

Table 3 show radiology staff members response to the external communication which revealed that a large portion viewed that PACS support and make external communication easier.

Approximately, 51.22% of the participants strongly agree and 43.9% agree that the PACS enables easy access and sharing of radiology data and images with other clinical departments while 4.88% disagree. In the same context, 43.9%
strongly agree and 51.22% agree to the statement that communication with other clinical departments has enhanced since PACS was installed. Similarly, 46.34% of the participants strongly agree and 46.34% agree that PACS improved the relationship between departments. Analyzing the statement if PACS affects service outcomes showed that the majority of respondents revealed that the PACS increased the service outcomes (Table 4). A larger portion of the respondents 60.98% strongly agreed and 39.02% agree that the radiology department provides better services after PACS installation. Moreover, about 65.85% strongly agree and 31.71% agree that since PACS has been installed, it has become an integral and essential part of the radiology department. Approximately, 58.54% of the participants strongly agree and 34.15% agree that PACS provides better management for the services of the radiology department. While 4.88% were undecided and 2.44% disagreed to the above statement. Further, 46.34% of the participants strongly agreed and 41.46% agreed that the installation of PACS has improved the accuracy and quality of medical interventions by clinical staff. However, 9.76% of the participants were undecided and 2.44% disagreed. A majority of respondents (56.10%) strongly agreed 41.46% agreed that the PACS integration with the Hospital Information System (HIS) or electronic medical record (EMR) made it possible for radiology reports to be produced much faster with better accuracy. Regarding to the statement that PACS provides better interpretive information with radiology reports for the benefit of radiology department and clinical staff, 43.90% strongly agreed, 46.34% agreed, 7.32% undecided and 2.44% disagreed.

PACS user's perspective on personal intentions in using PACS was displayed in Table 5. A larger portion of the respondents (48.78%) strongly disagreed and 31.71% disagreed to the statement that they have no intention in using PACS while 9.76% were undecided and 9.76% agreed. Further, 57.5% of the participants strongly agreed and 40.00% agreed that they intend to

use PACS as much as possible while 2.50% disagreed. The PACS user's perspective on Personal Hassles was displayed in Table 6. Even though 48.78% of the participants disagreed that they receive more calls now requesting information regarding PACS functions and services, 31.71% were undecided, and 4.88% strongly disagreed. While 14.63 of the participants agreed and 4.88% strongly agreed to the above statement. Approximately, 43.90% of the participants strongly agreed, 41.46% agreed, 7.32% undecided and 7.32% disagreed that since installation of PACS I feel much satisfied now with my work. On examining the statement, if PACS increases the work responsibilities and demands on radiologists and radiology department staff, 26.83% strongly agreed, 29.27% agreed while 26.83% disagreed, 4.88% strongly disagreed and 12.20% undecided. Even though 43.90% of the participants disagree that the PACS increased the amount of work required from radiology department staff, 7.32% strongly disagreed, 19.51% agree, 19.51% undecided and 9.76% strongly agree. Further, 63.41% of the participants disagreed, 24.39% strongly disagreed to the statement that Because of PACS, my job has transformed from being a radiologist or technologist into becoming an office clerk. While 7.32% undecided, 2.44% agreed and 2.44% strongly agree. Even though 48.78% of the participants disagreed that the PACS has slowed their work as radiologists or technologist because of the data entry process related to the PACS, 41.46% strongly disagreed. While 7.32% agree and 2.44% strongly agreed to the above statement.

PACS user's perspective on increase blame in using PACS was displayed in Table 7. Approximately, 7.50% of the participants strongly agreed and 17.50% agreed that after PACS installation, they receive more calls regarding problems and issues that they should not be dealing. While 57.5% disagreed, 5.00% strongly disagreed and 12.50% were undecided. Regarding to the statement that the respondents were blamed for PACS errors and failures that is out of the control of the radiology department, 5.00% strongly agreed, 20.00% agreed while 20.00%, were undecided, 42.50% disagreed and 12.50% strongly disagreed. Approximately 47.50% of the participants disagreed and 35.00% strongly disagreed that physicians' complaints

to the radiology department have increased after PACS installation. However, 7.50% were undecided, 7.50% agreed and 2.50% strongly agreed to the above statement. On examining the statement, if physicians are less cooperative with the radiology department after PACS installation, 60.00% disagreed, 20.00% strongly disagreed while 10.00% agreed and 10.00% were undecided. Further, 51.22% of the participants disagreed, 19.51% were undecide to the statement that they believe that the PACS team and Information System Department interfere in the radiology department work after PACS installation. Moreover, about 12.20% strongly disagreed, 12.20% agreed and 4.88% strongly agreed.

Although 48.78% of the participants disagreed that the physicians and other clinical staff are less appreciative toward PACS, 21.95% were undecide, 12.20% strongly disagreed, 14.63% agreed and 2.44% strongly agreed. Approximately 53.66%of the participants disagreed and 21.95%strongly disagreed that PACS causes an unfriendly behavior from clinical staff towards the radiology department. However, 12.20% agreed, 7.32% were undecided and 2.44%strongly agreed to the above statement.

Table 3

Response to External Communication.

External Communication	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
9.PACS enables easy access and sharing of radiology data and images with other clinical departments.	N = 21 51.22%	N = 18 43.9 %	N = 0 0.00%	N = 2 4.88%	N = 0 0.00%	N = 41 100%	4.41	.740

10.Communicati on with other clinical departments has enhanced since PACS was installed.	N = 18 43.9%	N = 21 51.22 %	N = 1 2.44%	N = 1 2.44%	N = 1 0.00%	N = 41 100%	4.36	.661
11.Overall, PACS improved the relationship between clinical departments and the radiology department.	N= 19 46.34%	N= 19 46.34 %	N=2 4.88%	N = 1 2.44%	N = 0 0.00%	N = 41 100%		

Table 4

Response to Service Outcomes.

Service Outcomes	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
12.The radiology	N = 25	N =	N = 0	N = 0	N = 0	N = 41	4.60	.493

department provides better services after PACS installation.	60.98%	16 39.02 %	0.00%	0.00%	0.00%	100%		
13.Since PACS has been installed, it has become an integral and essential part of the radiology department.	N = 27 65.85%	N = 13 31.71 %	N = 1 2.44%	N = 0 0.00%	N = 0 0.00%	N = 41 100%	4.63	.536
14.PACS provides better management for the services of the radiology department.	N = 24 58.54%	N = 14 34.15 %	N = 2 4.88%	N = 1 2.44%	N = 0 0.00%	N = 41 100%	4.48	.711
15.The installation of PACS has improved the	N = 19 46.34%	N = 17 41.46 %	N = 4 9.76%	N = 1 2.44%	N = 0 0.00%	N = 41 100%	4.31	.756

accuracy and quality of medical interventions by clinical staff.								
16.PACS integration with the Hospital Information System (HIS) or electronic medical record (EMR) made it possible for radiology reports to be produced much faster with better accuracy.	N = 23 56.10%	N = 17 41.46 %	N = 0 0.00%	N = 1 2.44%	N = 0 0.00%	N = 41 100%	4.51	.637
17.PACS provides better interpretive information with radiology reports for the benefit of	N = 18 43.90%	N = 19 46.34 %	N = 3 7.32%	N = 1 2.44%	N = 0 0.00%	N = 41 100%	4.31	.722

radiology department and clinical staff.

Table 5.

Response to Personal Intentions

Personal Intentions	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
18.I have no intention in using PACS (I am not going to use the PACS).	N = 0 0.00%	N = 4 9.76%	N = 4 9.76%	N = 13 31.71%	N = 20 48.78%	N = 41 100%	1.80	.980
19.I intend to use PACS as much as possible.	N = 23 57.5%	N = 16 40.00%	N = 0 0.00%	N = 1 2.50%	N = 0 0.00%	N = 41 100%	4.52	.640

Table 6.

Response to Personal Hassles

Personal Hassles	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
20.I receive more calls now requesting information regarding PACS functions and services	N = 2 4.88%	N = 6 14.63 %	N = 13 31.71%	N = 18 43.90%	N = 2 4.88%	N = 41 100%	3.29	.955
21.Since installation of PACS I feel much satisfied now with my work.	N = 18 43.90%	N = 17 41.46 %	N = 3 7.32%	N = 3 7.32%	N = 0 0.00%	N = 41 100%	4.21	.880
22.PACS increases the work responsibilities and demands on	N = 11 26.83%	N = 12 29.27 %	N = 5 12.20%	N = 11 26.83%	N = 2 4.88%	N = 41 100%	2.53	1.286

radiologists and radiology department staff.								
23.PACS increased the amount of work required from radiology department staff.	N = 4 9.76%	N = 8 19.51 %	N = 8 19.51%	N = 18 43.90%	N = 3 7.32%	N = 41 100%	3.19	1.144
24.Because of PACS, my job has transformed from being a radiologist or technologist into becoming an office clerk.	N = 1 2.44%	N = 1 2.44 %	N = 3 7.32%	N = 26 63.41%	N = 10 24.39%	N = 41 100%	4.04	.804
25.PACS has slowed our work as radiologists or technologist because of the data entry	N = 1 2.44%	N = 3 7.32 %	N = 0 0.00%	N = 20 48.78%	N = 17 41.46%	N = 41 100%	4.04	954

process related
to the PACS.

Table 7
Response to Increase Blame

Increase Blame	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree	Total	Mean	Standard Deviation
27.After PACS installation, we receive more calls regarding problems and issues that we should not be dealing with.	N = 3 7.50%	N = 7 17.50%	N = 5 12.50 %	N = 23 57.5%	N = 2 5.00%	N = 41 100%	4.19	.954
28.We are blamed for PACS errors and failures that is out of the control of the radiology department	N = 2 5.00%	N = 8 20.00%	N = 8 20.00 %	N = 17 42.50%	N = 5 12.50%	N = 41 100%	3.37	1.102

29.Physicians' complaints to the radiology department have increased after PACS installation.	N = 1 2.50%	N = 3 7.50%	N = 3 7.50%	N = 19 47.50%	N = 14 35.00%	N = 41 100%	4.05	.985
30.Physicians are less cooperative with the radiology department after PACS installation.	N = 0 0.00%	N = 4 10.00%	N = 4 10.00 %	N = 24 60.00%	N = 8 20.00%	N = 41 100%	3.90	.841
31.I believe that the PACS team and Information System Department interfere in the radiology department	N = 2 4.88%	N = 5 12.20%	N = 8 19.51 %	N = 21 51.22%	N = 5 12.20%	N = 41 100%	3.53	1.02

work after PACS installation.	N = 1 2.44%	N = 6 14.63%	N = 9 21.95 %	N = 20 48.78%	N = 5 12.2%	N = 41 100%		
32.Physicians and other clinical staff are less appreciative toward PACS.								
33.PACS causes an unfriendly behavior from clinical staff towards the radiology department.	N = 1 2.44%	N = 5 12.20%	N = 4 7.32%	N = 22 53.66%	N = 9 21.95%	N = 41 100%	3.80	1.00

Chapter 4

4.DISCUSSION

The purpose of the presented study was to explore the effect of PACS on the quality of radiology staff members' work from their perspective. Studies that have investigated the impact of PACS system are small in number. Therefore, the present study examines the effect of PACS's on its users based on five interrelated variables; external communication, service outcomes, personal intentions, personal hassles, and increased blame. PACS is considered as an essential system in the radiology department as it interacts with RIS for archiving or fetching medical images, whereas the department previously used a radiology film that caused a hassle for the radiologist (Aldosari et al., 2018). Eventually, an implementing system such as PACS solved the issue. The study findings have shown that radiology staff had a positive stance toward PACS, which agreed with the results of other similar studies. A study conducted by Aldosari et al. (2017) investigate the effect of the laboratory information system (LIS) at the National Guard laboratory department show a positive impact of the LIS system on its users (Aldosari et al., 2017). Another similar study on PACS also showed a positive effect on the radiology department in Saudi Arabia (Aldosari et al., 2018). Finally, this study has shown that the radiology staff had an overall positive stance toward PACS usage and their daily work impact of PACS on the users from their perspective within the radiology department that resulted in its efficient workflow. Radiology department management can use this system to enhance its efficiency and functionality. Most importantly, healthcare officials should maintain staff members' positive perceptions of PACS by including them in any decision making.

4.1 Limitations and recommendations

This study was limited to radiologists and did not involve other health care providers. Therefore, there is a need for further research that would substantiate the study's findings by involving other. The knowledge of the response rate was 82% at the beginning due to the limited time in distributing the survey that started on April 1, 2020 and took about a week to collect data. However, given the scope of this study and time constraints, the study rate is sufficient, in my opinion, and I believe that the scope can be improved if additional study time is done. More data should be collected through access to the radiology department of King Khalid Hospital in Hafr Al-Batin. and Hafr Al-Batin. General Hospital for future research. In addition, applying regression after reaching the required amount of valid responses will contribute significantly to the further understanding of the effect of PACS on its intended users in the radiology department.

4-2. CONCLUSIONS

This study was conducted at King Khalid General Hospital in Hafr Al-Batin. to explore the perception of a healthcare professional working in the radiology department about the effect of the PACS system on the quality of their work. The study showed that the users of the PACS system had given a positive perception and direction towards the PACS, and its effect and routine were positive. Variables such as personal intentions, external communication, service outcomes, personal hassles, and increased blame were used in this study to perform a statistical examination of Pax's effect on the targeted staff in the radiology department. The main goal is to assist them in maintaining their continued user satisfaction and enhancing PACS functionality in the future.

7.References

1. Aldosari H, Saddik B, Al Kadi K. 2018;. Impact of picture archiving and communication system (PACS) on radiology staff. Informatics in Medicine Unlocked10:1-16.
2. Aldosari B. 2012;User acceptance of a picture archiving and communication system (PACS) in a Saudi Arabian hospital radiology department. BMC medical informatics and decision making. 12(1):44.
3. Goodarzi H, Khatami S-M, Javadzadeh H, Mahmoudi S, Khajehpour H, Heidari S, et al. 2016; User acceptance of picture archiving and communication system in the emergency department. Iranian Journal of Radiology. 13(2).
4. Buabbas AJ, Al-Shamali DA, Sharma P, Haidar S, Al-Shawaf H. 2016; Users' perspectives on a Picture Archiving and Communication System (PACS): an in-depth study in a teaching hospital in Kuwait. JMIR medical informatics. 4(2):e21.
5. Aldosari B, Gadi HA, Alanazi A, Househ M. 2017; Surveying the influence of laboratory information system: An end-user perspective. Informatics in Medicine Unlocked. 9:200-9.
6. Kaplan B, Duchon D. 1988: Combining qualitative and quantitative methods in information systems research: a case study. MIS quarterly. 571-86.
7. Kaplan B, Duchon D. 1989; A job orientation model of impact on work seven months post-implementation. Medinfo. 89:1051-5.