

THE IMPACT OF USE OF TECHNOLOGY IN THE MODERN HEALTH CARE WORPLACE REPORT 2

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Introduction

This research focuses on the use of technology and communications system in the modern healthcare workplace and the impact it has had on this sector. This research will be based on a healthcare or institution which could be the place where we work or any other healthcare service provider in the UK such as Hospital, Nursing Home, Care Home, GP surgery, Day Centres, Nurseries, Nursing homes, Rehabilitation Centres etc.

This research will be quantitative and the data collection will be secondary. The institution I have selected is the Chase Farm Hospital located in Enfield, North London.

The results of this research will be shown through different graphs such as pie charts, bar charts. I will analyse the graphs and compare them through secondary information. Afterwards I will show a summary of the results obtained and then the conclusions will show how the use of technology has impacted in the modern health care workplace.

The Royal Free London is one of the UK's biggest trusts, and became a Foundation Trust in 2012. It employs over 10,000 staff to deliver care and treatment to more than 1.6 million patients each year across its three main hospitals. The trust supports delivery of approximately 8,000 babies a year and has over 200,000 A&E attendances a year. The trust has 1,770 beds across three sites: Barnet Hospital (440 beds), Chase Farm Hospital (74 beds) and the Royal Free Hospital (830 beds), and in total over 30 locations where services are provided by the trust (11 locations registered with CQC) (Royal Free London NHS Foundation Trust Inspection Report, 2021).

Chase Farm Hospital is part of the Royal Free London NHS Foundation Trust group since 2014 offering a wide range of medical services. Is located on Enfield , North of London. In 2016, NHS England named the RFL as a Global Digital Exemplar (GDE) - one of 16 digitally advanced acute trusts chosen to pioneer new technology.(Your visit | Welcome to the new Chase Farm Hospital | Chase Farm Hospital | The Royal Free, 2021).

As part of the Chase Farm Hospital's communication systems we find patient portal – patients will have greater control and involvement in their own care. They will be able to view their medical history, test results and upcoming appointments.

A mobile appointment manager app will be tested to enable patients to check in and be called to their appointments from their mobile device.

Latest healthcare innovations aimed at improving patient safety including the instant alert systems such as Streams, which detects early warning signs of acute kidney injury.

Regarding the operating theatres, the advances have been notorious since the adoption of high technology devices in anaesthesia and medical records. (Chase Farm Hospital ... welcome to the future NHS | News | News & Media | The Royal Free, 2021).

Rationale

Technology has brought immense change in the care industry. access to health services is now easier and faster, technology tools have been able to reduce invasive procedures through rapid, less risky ambulatory procedure.

However, we must emphasize that not everything has been good with the advent of technology in health care also has had negative effects and that is why this research seeks to show the negative and positive impact of the use of technology in modern health care workplace.

Research Objectives

1. To know the technology and communications system that used in Chase farm Hospital in Enfield uk
2. To know the positive effects of the use of technology and communication systems in modern health care workplace.
3. To determine the negative effects of the use of technology and communication systems in modern health care workplace.
4. To analyse the outcome of both the negative and positive effects and to establish the impact that this has on the use of technology in modern health care workplace.

Literature Review

Impact of use the technology

Impact analysis provides knowledge on both positive and negative effects as a result of a change or an intervention undertaken (Peersman, 2021). This means that an impact analysis must establish what has been the course of observed changes (in this case impacts) referred to as causal attribution (also referred to as causal inference).

Technology the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to the change and manipulation of the human environment (Britannica, T. Editors of Encyclopaedia, 2021).

Technological development over time has saved countless lives and its constant growth promotes a better quality of life every day. In the medical field, technology has had a massive impact on the processes and practices of health professionals (The Impact of Technology in Healthcare, 2021).

Several studies have been conducted regarding the use of technology in health care and the positive and negative impact it has had on the overall health care sector. In the research by Braimer, David he intends to analyse the impact of technological innovation on health service delivery in the case of NHS UK. The methodology used was of a mixed quantitative and qualitative type, and among the results found were the following:

Easy and fast diagnosis and treatment, enhanced quality and standard, improved efficiency and service, reduction in medical errors, better research and development. However few negative results such as high cost for the service user and mistakes due to technical defects have been found in this study.

In the article by Aloitabi and Federico (2017) he intends to review the impact of health information technology on patient safety in hospitals and community with an intervention of any of the following; electronic physician's orders (CPOE), clinical decision support (CDS), E-prescribing, electronic sign-out and hand-off tools, bar code medication administration (BCMA), smart pumps, automated medication dispensing cabinets (ADC), electronic medication administration record (eMAR), patient data management systems (PDMS), retained surgical items detectors, patient electronic portals, telemedicine, electronic incident reporting, and electronic medical record (EMR).

The most significant results were:

Reducing human errors, reducing medication errors, reducing adverse drug reactions, improving compliance to produce guidelines.

In the article by LTH and KL Ong (2002) the impact of technology in health care today shows how life expectancy has increased in the last decades but also a term called ethics has been involved which seen from the point of view of medicine should not be a problem but studies show the other side of the coin where excessive costs, unnecessary performance of procedures that could be performed at lower cost, implementation of new technologies without the necessary reliability studies among others call into question our health care system.

In the article by (Powell C, Nelson P.(2021) the general public believes that technology will improve health care efficiency, quality, safety, and cost. However, few people consider that these same technologies may also introduce errors and adverse events. Given that nearly 5,000 types of medical devices are used by millions of health care providers around the world, device-related problems are inevitable. Based on a review of the literature, a conceptual framework was developed that depicts the relationship among the nurses' use of technologies; moderating and mediating factors that affect use; and the potential nurse, patient, and organizational outcomes. Research on the quality of care reveals a health care system that frequently falls short in its ability to apply new technology safely and appropriately. Workplaces, instruments, and equipment can be developed according to human factors design criteria, but as an end-user, nurses can maximize safety through the selection process, ongoing surveillance of equipment, and proactive risk-assessment methods.

In the study by Clarke et al., (2021) the aim was to explore NHS staff perceptions and experiences of the impact on patient safety of introducing a maternity system. the methodology was Qualitative semi-structured interviews were conducted with 19 members of NHS staff who represented a variety of staff groups (doctors, midwives, health care assistants), staff grades (consultant and midwife grades) and wards within a maternity unit. Participants represented a single maternity unit at a NHS teaching hospital in the North of England. Interviews were conducted during the first 12 months of the system being

implemented and were analysed thematically. As a results Participants perceived there to be an elevated risk to patient safety during the system's implementation. The perceived risks were attributed to a range of social and technical factors. For example, poor system design and human error which resulted in an increased potential for missing information and inputting error.

In line with the study carried out by Phichitchaisopa N. and Naenna T. (2013) the unified theory of acceptance and use of technology (UTAUT) was applied in a province in Thailand to analyse the factors influencing information technology (IT) services in health care. The methodology used was a questionnaire applied to 400 employees including doctors, nurses and hospital staff members through the equation modelling technique. Among the results it was found that the significant factors were performance expectancy, effort expectancy and facilitating conditions, where performance and facilitating conditions should be strengthened the most.

Wolff J. in his study aimed to systematically review and summarise cost-effectiveness studies on AI in healthcare and to analyse whether they meet established quality criteria. The study method was carried out in three steps: firstly, quality criteria for economic impact studies were defined, secondly, a systematic qualitative and quantitative literature review was conducted in which the quality of economic impact studies was analysed. As a results the 66 reviews just 6 studies could be included in the second step. However , none had a methodologically complete cost impact analysis. There are two areas for improvement in future studies. First, the initial investment and operational costs of AI infrastructure and service need to be included. Secondly, alternatives for similar impact need to be analysed to provide a comprehensive comparison.

5. Research Methodology

5.1 Qualitative, Quantitative and combined approach

Quantitative Research Method: “Quantitative research is defined as a systematic investigation of phenomena by gathering quantifiable data and performing statistical, mathematical, or computational techniques..” (Quantitative Research: Definition, Methods, Types and Examples (QuestionPro, 2021).

Qualitative Research Method: “Qualitative research involves collecting and analyzing non-numerical data (e.g., text, video, or audio) to understand concepts, opinions, or experiences. Qualitative research is commonly used in the humanities and social sciences, in subjects such as anthropology, sociology, education, health sciences, history, etc.” (Base and research, 2021).

This research will be based on the quantitative method, i.e. the use of graphs such as the bar-chart and the pie-chart to understand the result and analysis .

5.2 Data Collection Process

Primary data: “Is a type of data that is collected by researchers directly from main sources through interviews, surveys, experiments, etc. Primary data are usually collected from the source—where the data originally originates from and are regarded as the best kind of data in research” (Blog, F, 2021).

Secondary data: “is the data that has already been collected through primary sources and made readily available for researchers to use for their own research. It is a type of data that has already been collected in the past.” (Blog,F, 2021).

This research will be oriented on secondary data by collecting the information through websites, articles, lists, research, reports, etc.

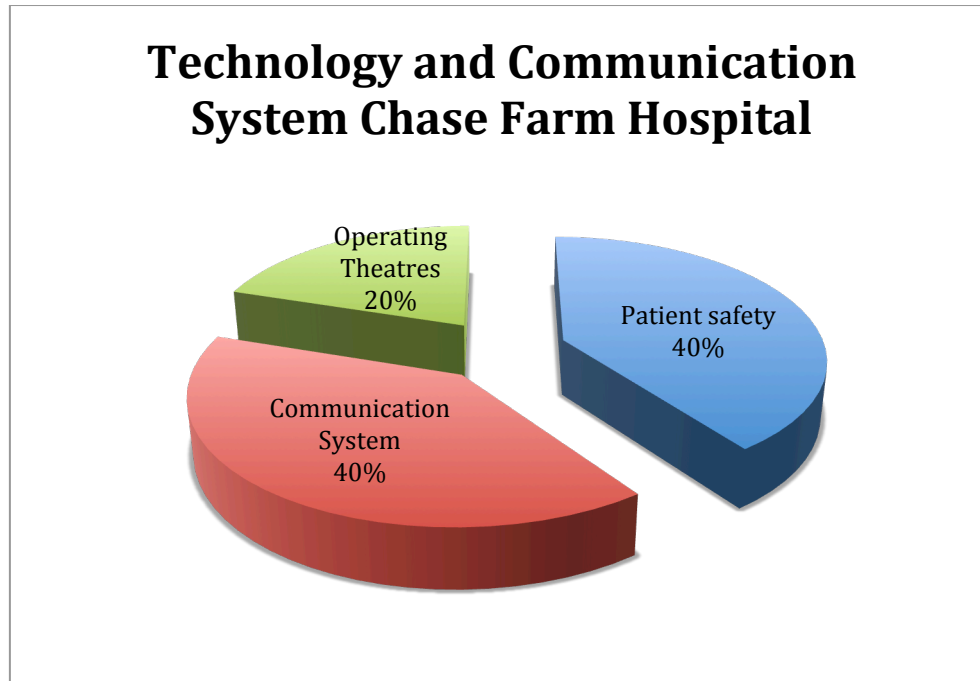
5.3 Population, sample and sample size

The sample size will be the organizations that I choose for this research. Were about 7 in total.

5.4 Ethics in Data Collection

Ethical considerations refer to the ethical practices of how data is collected, stored or shared. These can include securing clear and informed consent, how to safely store data or how to secure permissions to use or share data. (3.1 Understanding the Ethics of Data Collection - Centre for Innovation in Campus Mental Health, 2021). This present research is not targeted to any individual, group, society, race or religion and it is ensured that no harm is done to anyone through conducting the research. This research has been done with full dedication, sincerity, honesty; confidentiality and truthfulness with thorough follow of research ethics. The data and information collected through the secondary sources were included in the study only after mentioning credit to the original authors. (Braimer, 2021).

Result/Finding, Analysis and Discuss



Operating Threatres	Patient safety	Communication system
20%	40%	40%

Graph Analysis: 40% of the technology implemented in the Chase Farm Hospital is directed to patient safety, the other 40% to communication systems and the remaining 20% to the surgery area.

Regarding communication systems, the institution offers an appointment portal and a mobile phone application. Concerning patient safety, it offers alert systems such as streams and digital medical records. Finally, in the area of surgery, this institution is aiming for a high-tech system. Healthcare technology is among the most important equipment in a hospital. It helps to improve the quality and performance of treatments (Calman et al., 2007).

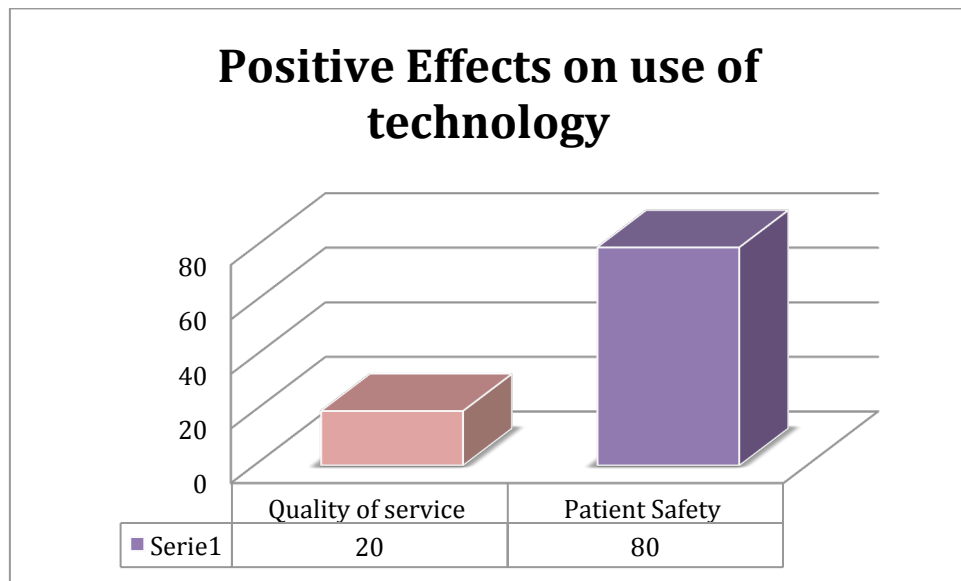
On 2019 the trust had a visit by CQC (Comision Quality Comission) This was the first inspection of Chase Farm Hospital under the new methodology. The rated of the hospital as Good overall with all core services rated as Good a few areas rated as Requires Improvement.

Report 2019 by CQC

Ratings	
Overall rating for this trust	Requires improvement ●
Are services safe?	Requires improvement ●
Are services effective?	Good ●
Are services caring?	Good ●
Are services responsive?	Requires improvement ●
Are services well-led?	Good ●
Are resources used productively?	Requires improvement ●
Combined quality and resource rating	Requires improvement ●

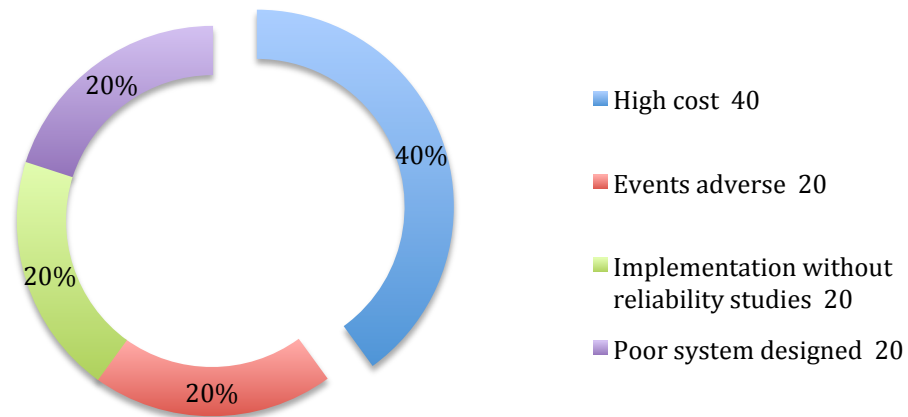
1 Royal Free London NHS Foundation Trust Inspection report 10/05/2019

In this graph we can notice that the inspection about safety require improvement also the services related with responsive and productively. It Is important to know that even with high technology can not guarantee quality of care related with patient safety.



Graph Analysis: According with the analysis of the researchs 80% of the positive effects of use the technology is related with the patient safety these were reducing humans errors, reducing medication error, reducing adverse drug reaction and improving to produce guidelines. 20% is related with the quality of the service these were easy and fast diagnosis and treatment, enhaced quality and standard, improved efficiency and service, reduction in medical errors, better research and development. Healthcare technologies can decrease medical errors, identify patients, manage physician/nurse teams, and improve service quality and safety (Holden, 2010; Chen et al., 2007; Fisher and Monahan, 2008).

Negative Effects of use the technology



Graph analysis: related with negative effects of use the technology I found High cost with 40%, Event adverse 20%, Implementation without reliability studies 20%, poor system designed 20%. (Clarke et al., 2021) and the research by (LTH and KL Ong 2002)

Technology will be implemented strongly in the field of medical equipment, with solutions already being discussed and analysed: biochips, mobile monitoring, but also in fields with a lot of innovation such as nanorobotics and 3D printing (which can create tissues that can revolutionise fields such as organ transplants). The technology is already here, the problem is that the total metamorphosis of the health system will only be possible with new health models that public representatives will have to know how to deal with and manage. We have seen how we find both positive and negative effects of this issue, however, it should be noted that technology is advancing by leaps and bounds and professionals also need to be trained and acquire the necessary knowledge to be at the forefront.

Conclusion

As a conclusion of the impact of the use of technology in health care, it is important to highlight that technology brings with it both positive and negative aspects, therefore a balance must be guaranteed between access to new medical technologies, the sustainability of health services and the preparation of professionals in these stages.

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