

BMSW4003

Digital Skills and Research Methods

Assessment 2: Research Skills for Healthcare

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Title

“The Use of Technology in Modern Healthcare Workplace: A Study on Hospital”

Rationale

Technology has brought a huge positive change to the healthcare industry throughout the world by improving administration activities and other services. Several studies in this area have shown the increasing trend of using different types of modern technology, tools, and types of equipment in different healthcare workplaces like Hospitals, Nursing Homes, Care Homes and Day Centers, etc. This research report includes the use of technology and communication system in the hospital's internal settings. There are still so many hospitals that are not well-developed yet with the most advanced technologies. Moreover, there are some hospitals too that are not much aware of other relevant legal, ethical, and security issues. This study shows a secondary data analysis from where the insight of the usage of technologies and awareness of these issues will be drawn. It is hoped that this report will significantly include and discuss the use of technology and other related issues as well to ensure an overall understanding.

Aims and Objectives

This research aims to study the use of technology in modern healthcare workplaces i.e. hospitals. Objectives of this research are:

- To explore the technology and communication systems used in hospitals
- To understand the relevant legal, ethical, and security issues of technology

Methodology

This research basically is secondary research where the descriptive qualitative method of research has been used as well as a quantitative method. I have collected all the data from existing data sources like the internet, institutional resources, and research reports. I choose this approach to be the most appropriate one as it will help to collect necessary information about the research topic. The data collection method includes existing data collection and I have analysed 160 hospitals and recorded available information using Microsoft Excel. It took almost 2.5 months to collect all the data. The data analysis was done based on the content and observations where the thematic method has been used for analysing qualitative data and average or mean method has been used for the quantitative data. This research is conducted

based on the information collected from the sample of 160 hospitals along with some existing research papers. So I thought this method of research is satisfactorily compatible.

Literature Review Methodology

To identify the sources for this literature review, diverse databases were used. First of all, I used Google Scholar to find out some available research papers that are primarily sourced and related to my research purpose. After that, by studying those articles and utilizing others database selectors like SAGE for some days; I made a list of some more relevant and refined articles to use. I analysed the sources based on some criteria. First of all, I checked the likeliness of the sources with the purpose of my literature review. Secondly, I ensured that all the sources are properly peer-reviewed. Finally, I ensured that the journals selected are of the recent publication dates. Latterly I prepared almost all the literature review based on the statements and knowledge gathered from these articles. Rests of the statements used are from the data collected from the internet and institutional resources. The fundamental reason behind using these sources is to provide some proven and material thought in this perspective.

Analysis and Discussion

Different approaches were taken by some other researchers previously where they tried to uphold different types of new technologies, the pattern of usage, and importance of those regarding healthcare workplace. In 2014, Rajkumari researched and evaluated the impact of technology in better healthcare activities and methods and stated that the use of technology in hospitals reduces medical errors and increases healthcare efficiency and quality of patient care. The researchers used six months prospective study among 40 doctors and nurses where data was collected using a structured questionnaire.

Another research conducted by Bohr and Memarzadeh (2020), explained the rise of artificial intelligence in healthcare workplaces like hospitals and various success factors of using this technology. Artificial intelligence is very effective for a variety of tasks from administrative workflow to clinical documentation and it improves healthcare services to the highest extent (Bohr and Memarzadeh, 2020).

Technology enables hospitals and different types of healthcare workers to perform their responsibilities and tasks more efficiently with the highest quality. It is very known that, in this modern era, the number of hospitals not using digital technology is very minimal. Technology offers a lot of opportunities to improve and transform healthcare facilities in hospitals by

reducing medical errors, increasing clinical outcomes, enabling care coordination, and tracking data regularly that bound hospitals and other healthcare workplaces to ensure all the advanced technologies everywhere (Rajkumari, 2014). Although this research does not include primary data collection and physical look-over, the result shows almost much significant applicability. The data used for the analysis are provided in the appendix section of this report.

Electronic Health Record System

According to Bohr and Memarzadeh (2020), almost 82% of hospitals nowadays have this technology in their internal setting. In the UK, the use of this technology has been started in 2002 and the demand for this technology is so high now. The main objective of using this electronic health record system is to gather patient records from across the UK and to increase service efficiency. Data sharing is fully under a cloud computing system and most of the hospitals are using a strong protocol as well to ensure the security of the information. This technology offers a long-term opportunity also since the data gathered now can be used after 500 years even for different scientific and statistical purposes (Watson, 2016).

Self-service Kiosks

According to Khezzr et. al., (2019), Self-service Kiosks are such a technology that helps to perform schedules more quickly and efficiently besides reducing the overall costs. This researcher in this paper also stated that this technology works as a one-time investment regarding its effectiveness. According to Khezzr et. al., (2019), almost 87% of hospitals already use this technology while the percentage will rapidly get increased soon. With this technology patients are fully able to conduct their pre-treatment basis contact without interacting with healthcare staff. This enables saving time for hospitals and patients both as well as saves the costs of staff.

Healthcare Trackers and Sensors

Since the future trend of healthcare technology broadly expects that people will take care of their health through technologies and be highly empowered, the use of health trackers, wearable and sensors are increasing day by day (Rajkumari, 2014). According to Mather and Cummings (2019) and Rajkumari (2014), almost 92% of hospitals initiated tracking processes and sensors for their patients to make them professionally self-empowered. Also, hospitals should promote self-management and provide sufficient freedom to manage their conditions. This technology is mostly used in nursing homes, care homes, and day centres, etc.

Technology like wireless brain sensors helps doctors to deal with problems within the brain without any additional surgery (Mather and Cummings, 2019).

Robotics

Robotics technology has a direct effect on patient care, disinfecting patient rooms, minimizing risks of patients and other healthcare personnel (Rajkumari, 2014). Another research conducted by Kim, Gu and Heo (2016), robotics is used as a lab assistant and in preparing medications in pharmacological laboratories. The world now highly depends on robotic technology to increase healthcare quality and almost 77% of hospitals use modern and most advanced robotic facilities (Kim, Gu and Heo, 2016). Robotic surgery in a combination with augmented reality can help surgeons to have better real-time-based informational insight during operation also (Bohr and Memarzadeh, 2020).

Artificial Intelligence

According to Bohr and Memarzadeh (2020), artificial technology is so much beneficial for clinical decision making, robotic surgery, administrative process, virtual assistants, and image analysis in the healthcare sector. After realizing the effectiveness of AI, the use of this technology is massively expanding day by day. According to Ting et. al. (2020), almost 87% of hospitals use artificial intelligence more or less in their medical settings. This research also suggests that precision medicine and different digital health applications in hospitals can help healthcare professionals to make better predictions and treatments based on the person. Artificial intelligence has the ability to redesigning the whole healthcare sector by proper development of its drug-target interactions, genetic-based solutions, and deep designing treatment plans, etc. (Lee and Mirchandani, 2017).

Telehealth

Telehealth refers to such a technology that enables patients to stay connected with healthcare workers digitally without face-to-face interactions or waiting time for appointments. People prefer digitalized services and telehealth technology highly as it offers various access points to healthcare when needed (Watson, 2016). Although the number of hospitals using this technology is comparably less, it is expected to worth approximately \$113.1 billion by 2025 by the global telemedicine market and currently, around 56% of hospitals offer telehealth services (Banerjee, Drumright and Mitchell, 2018). However, this technology is beneficial for hospitals, healthcare professionals, and doctors also since it enables virtual interaction and instant

diagnosis as well as treatment advice. Additionally, it helps to save time and minimizing transportation costs as well. According to Watson (2016), telehealth and telemedicine enable patient improvement more than 20% faster than normal.

Importance of Understanding Legal, Ethical, and Security Issues

According to Burr, Taddeo and Floridi (2020), hospitals and other healthcare workplaces are the apparent targets for cyber-crime. These workplaces accumulate and store much public information that is valuable too. The presence and use of subsistent technology have made that information more accessible and risky. Medical records can be misused and sold also with the possibility of damaging the database. So it is a must for every hospital and healthcare institution to ensure the highest protection of their database from any kind of illegal, unethical, and unsecured issues. On the contrary, proper training on how to use related technologies should be ensured for all the health workers including doctors, nurses, staff, and other employees (Lee and Mirchandani, 2017). Authority should actively work on avoiding legal complexities, fraudulent activities, and reputational damage to ensure a better place for healthcare.

Conclusion and Recommendation

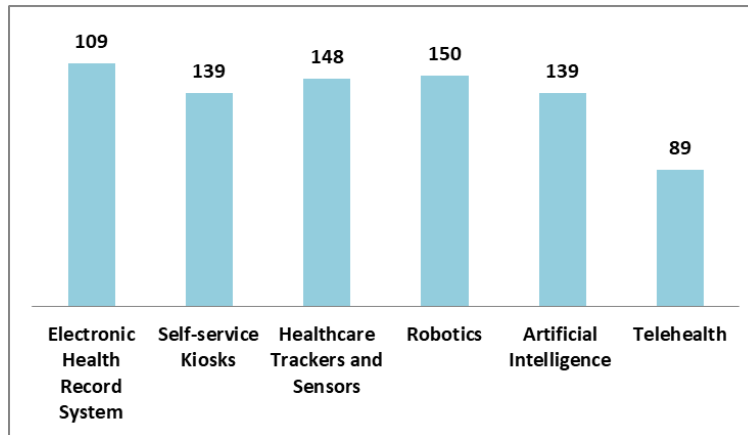
Healthcare workplaces like Hospitals hardly can be operated without digital technologies, so implementing these technologies with proper understanding and awareness will be the most sensible approach (Burr, Taddeo and Floridi, 2020). In fact, it is now like a most demanding thing that people expect to have digitalized services to patients for quick recovery and satisfactory service quality. Based on this research, Artificial intelligence, electronic health record systems, telehealth self-service kiosks, robotics, health trackers and sensors are some commonly used technologies that are taking the overall hospital settings higher gradually (Bohr and Memarzadeh, 2020). Technology acts like safeguards for a patient by offering advanced services through medication alerts, flags, diagnosis reports, reminders, and necessary consultations on time, etc. Moreover, the use of technology is beneficial for healthcare professionals and staff also. However, besides enjoying the positive facilities and advantages of technology, everyone should be aware of the negative sides of this blessing too. Both healthcare workers and a patient as an individual should be aware of sharing personal data when required to avoid illegal, unethical issues (Mather and Cummings, 2019). It is a responsibility for every hospital to ensure the highest security of one's personal information and the responsibility of an individual is to understand the whole process of sharing data, show pure consent and then pass it to others.

References

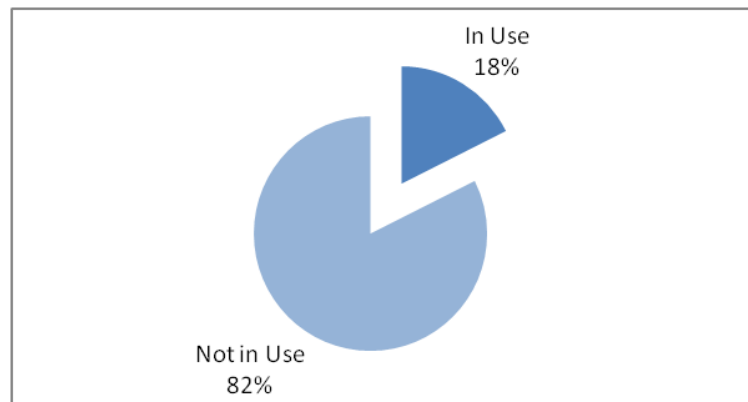
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Appendices

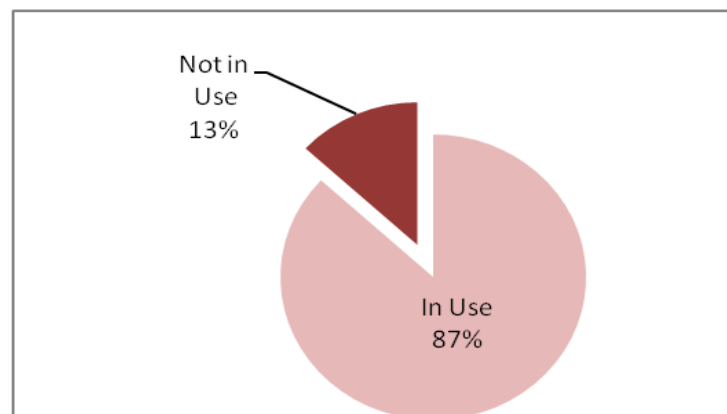
Appendix 1: Number of Hospitals Using Different Technologies



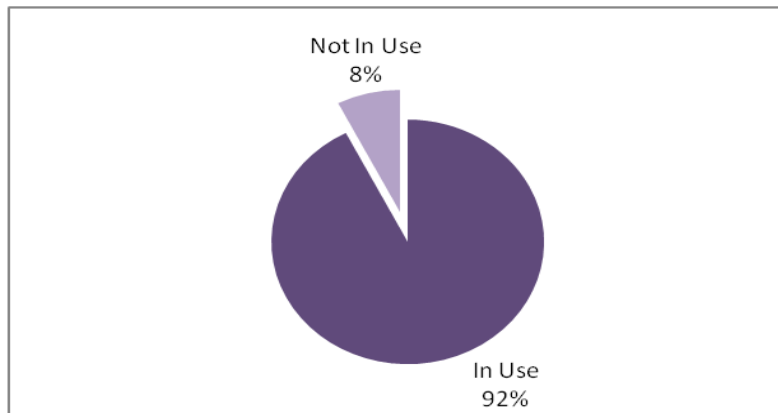
Appendix 2: Use of Electronic Health Record System



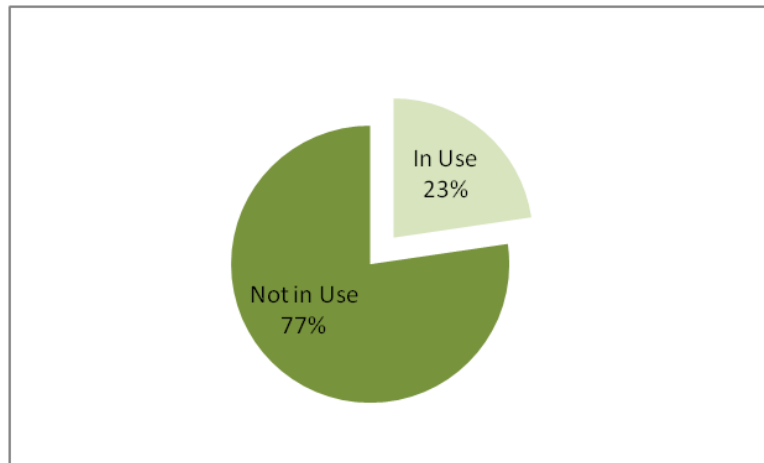
Appendix 3: Use of Self-service Kiosks Technology



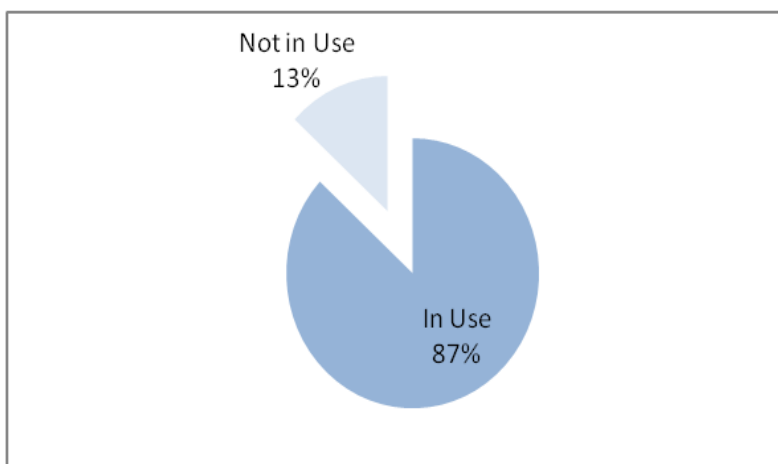
Appendix 4: Use of Healthcare Trackers and Sensors



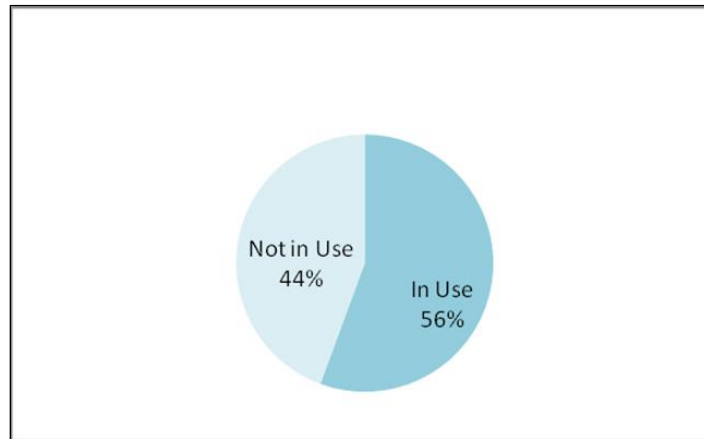
Appendix 5: Use of Robotics



Appendix 6: Use of Artificial Intelligence



Appendix 7: Use of Telehealth



Appendix 8: Percentage of Technologies Used in Hospitals

