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The Pivotal Role of Telehealth Technology in Risk Management and Risk Response Strategies

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A B S T R A C T

This research paper is a case study based aims to study how Telehealth technology mitigates Unknown–unknown risks , restrictions, lockdown and quarantine period. The research begins with listing the problem faced by many health sectors as they are searching for ways to provide the assistance required while protecting the healthcare provider and patients. The literature review lists the current existing cases that are using Telehealth technology in the pandemic to reduce the risk in addition to the benefits and challenges of the technology. In this research, two qualitative methods where used; personal interviews and online websites, webinars, and articles. The research involves both national and international organizations to provide the necessary information. As a result of our research method, we found that all mentioned organizations listed have an unknown-unknown risk management strategy. Besides, all of them used previously and are currently using Telehealth technology. Based on the gathered information and the listed methods used, this research's analysis supports the hypothesis that was conducted. According to the findings, Telehealth technology has been an ideal medical care solution during the Covid-19 pandemic, is beneficial for rural areas, and is cost-effective. On the other hand, as any technology is having a risk to it. Some of the risks are privacy protection, availability and accessibility, complicated health conditions, investments in training, incorrect diagnosis, and insurance coverage. As a result of this research, Telehealth technology does mitigate the unknown-risk and has mitigated it.

1. INTRODUCTION

Telehealth is a rapidly advancing technology using a collection of methods for enhancing health care and delivering health services through various telecommunication technologies such as virtual medical services [1-3]. Telehealth is the delivery of a health service across a distance.

Telehealth requires adaptation work and learning new competencies by clinicians, which decreased the dynamics and interaction between those involved in delivering health services [4-11]. Telehealth has many benefits. Thousands of outpatient appointments being reported throughput in major hospitals every year. The technology protects physicians, patients, and their families against contracting infectious viruses. It is crucial to consider the potential of telehealth as an alternative and increase the awareness on its importance [12-19].

The healthcare sector, during the pandemic, required to adapt to the situation. There was a

need to minimize health staff exposure to patients while increasing the patients' care. Health care systems had to adjust the technique of sorting, evaluating, consultations, and caring to patients. The change is to help deliver necessary healthcare while reducing the risk and ensuring healthcare staff and patients' safety. Telehealth technologies were an ideal solution to deliver health services during the pandemic [20-27]. For example, a patient in a rural area has a video conference appointment that may connect them directly to a central city hospital specialist.

During the pandemic, the research showed that Telehealth services had measurable and tangible results in mitigating unknown risk and in delivered the required health services taking into consideration the safety measures, social distancing and lockdown restrictions [28-33].

1.1 Research Problem

The world recently faced pandemic, which affected all sectors and daily life, including health care. People worldwide faced quarantine, lockdown, and strict measures for social distancing were taken. Despite the rapid spread of the virus and safety restrictions, people still need healthcare, medical consultation, and other health services [34-37].

Telehealth technology was a necessary solution during the uncertain time of Covid-19 to ensure citizens' wellbeing and offer the necessary medical and health services required.

1.2 Research Question

How can Telehealth technologies mitigate unknown risk (case study)?

This research will identify/investigate how Telehealth technologies mitigate the unknown risk and assist the health sector during the restrictions, lockdown, and quarantine period.

2. LITERATURE REVIEW

The outbreak of unknown risks shows the healthcare sector's need to adopt better and innovate ways to prevent a public health crisis [38-41]. The pandemics' widespread nature indicates the need for precautionary measures that safeguard physicians from exposure to risks. In this case, there are several opportunities to control the spread of health risks such as COVID -19 to improve care delivery in urban and remote locations. Telehealth is among the alternatives available to enable countries to adopt effective care practices in response to unknown risks. The technology protects the public, physicians, patients, and their families against contracting infectious viruses. It also supports the equitable delivery of services by enabling physicians to reach out to underserved communities. The technology enables countries to provide medical consultations that enrich citizens' lives through timely access to competent care.

Using Telehealth Technologies to Mitigate Unknown Risk (Case Study)

The UAE continues to make considerable progress in maintaining stable economic growth and stability. The country has made notable progress in relying on the latest technologies for care delivery [42-44]. The progress made by the UAE enables it to catch up with the various stages of technological development that allow the nation to respond appropriately to unknown risks. Similarly, the country proved its ability to utilize state-of-the-art technologies to improve people's health and welfare. Equally, the young population is willing to embrace new technologies, thereby making it easy to integrate healthcare systems in care centers nationally [45-49]. However, healthcare challenges still exist in the UAE due to emerging burdens that also occur in other parts of the world. The high rates of cancer, heart diseases, and the recently COVID-19 indicate the country's need to support collaborations and initiatives that shape its innovativeness. Implementation of tech innovations countrywide could help to address the challenges caused by Coronavirus and other future risks. The 24/7 Telehealth system is among the UAE's options to enable professionals to provide consultations from remote locations. Patients can send information, including photos, to assist in diagnosis and treatment. Equally, the Telehealth approach relieves the local facilities of the burdens of inconvenience and inefficiencies that deny more people the chance to access quality healthcare.

The Telehealth technology could apply well during a crisis that requires a quick response to dramatic developments [50-53]. Coronavirus's global media coverage, reactions, and worrying alerts show the government's need to identify new and better ways to prevent human suffering. Further, the COVID-19 brought trends such as overwhelmed care systems, increased need for emergency services, and evacuations that cause panic. Coronavirus's

declaration as a pandemic shows the seriousness of the situation and the need for healthcare systems to get the best equipment and deal with potentially high infection. Moreover, a sound approach has adequate technologies to address population-level anxiety associated with unknown health risks. The fact that the pandemic escalated quickly and without warning also shows the need for adequate prevention efforts [54-59].

Unknown health risks present new opportunities for the UAE to explore unavailable options. According to research, a significant consideration is to exploit the benefits of new technologies to support high-quality service delivery while protecting citizens from contact with infected persons. In this context, telehealth presents one of the best opportunities for the nation to protect healthcare workers from coming into contact with viral infections [60-67]. The technology is vital in low-resource regions or ones that are under immense pressure due to inadequate infrastructure and staff. The lockdowns and restricted movements brought by unknown health risks make individuals vulnerable to stress economic burdens and mental health issues.

Consequently, the government identifies unique and better technologies to help in addressing the needs of patients who require assistance but have limited access to essential resources [68-73]. Under the conditions identified, telehealth becomes an essential asset that has lasting implications across a nation's healthcare delivery system. Research suggest that technology is ideal for the best care that protects the public and professionals from direct contact with infected individuals [74-81].

The decision to use telehealth reduces resource exploitation across the healthcare sector, enhances access to care, and protects patients and physicians from infectious viruses [82-87]. Based on telehealth's massive benefits, it is suggested that technology availability is critical for individuals affected by new health risks. It helps to alleviate fears and anxiety among the public through timely access to information. In this context, patients can access routine care and learn to protect themselves. Equally, providers can identify patients who require additional interventions without making physical contact [88-91]. Therefore, the tools play a vital role in facilitating offices and emergency facilities to respond to a broader population's needs. Telehealth's past use in responding to the influenza outbreak in the United Kingdom reveals telehealth's potential in changing the health situation nationally. In this case, the innovative solutions reduce visits to healthcare facilities as the government strives to adopt robust interventions to prevent the spread of infectious conditions.

The level of urgency of health pandemics and the rapid spread also calls for broad implementation of telehealth capabilities [92-96]. The challenge is to ensure that every household has the device and networks required to interact with providers. The World Health Organization already requested countries to protect physicians and work on saving the elderly and individuals with other chronic conditions. It also urged nations to safeguard the vulnerable groups by responding effectively to minimize the speed of spreading [97-101]. The priorities set by WHO in response to pandemics show the need for governments to acknowledge telehealthcare's role in reducing interactions and risks associated with the pandemic. Equally, communities can rely on the technology to identify and protect high-risk individuals by reducing exposure to locations frequented by those with the virus [102-109].

Recently, with detecting a case of Coronavirus in a cruise ship, the patients in the cruise ship underwent remote examination without a physician's presence [110-115]. Robotic telemedicine controlled by professionals facilitated the monitoring of blood pressure, temperature, and pulse, thereby paving the way for doctors and nurses' informed decision [116-121].

The high number of infected care personnel and deaths from infectious diseases show the level of risk physicians face as they try to control the situation. On the global scale, the number of documented health risks continues to rise, hence exploring virtual care delivery [122-129]. The solutions allow providers to screen patients for infections away from crowded healthcare facilities. Therefore, telehealthcare keeps unaffected providers and citizens safe, thereby lessening the burden of government and healthcare facilities. However, successful implementation of the solution is only possible through appropriate integration into the healthcare system [130-133]. The barriers to telehealth use require close attention to the different issues that slow and

fragment the technology's uptake. Substantial efforts are necessary to scale-up adoption through routine use of the technology. The limited success in countries such as Australia indicates the need for extensive consultations to enhance the development and implementation of highly functional telehealth services. A similar experience in the United States shows the need for increased willingness among physicians to push for telehealth implementation [134-139]. Such efforts by clinicians make the government aware of the need for timely response to health risks.

Telehealth is categorized among disruptive innovations, showing the need for increased support from healthcare professionals to learn new and better consulting ways [140-142]. The challenges also reveal the need for extensive training to make physicians knowledgeable and aware of technology's relevance in the modern healthcare system. Further, the barriers can be addressed through regular practices that support sustainable solutions. Indeed, physicians should be ready for telehealth to protect themselves from contracting infectious viruses. It is also necessary to include telehealth in the curriculum to send a clear message to professionals about identifying new and better ways to enrich citizens' lives [143-145].

A well-organized healthcare system is necessary to support the expansion of telehealth. In this case, the government collaborates with the private sector to facilitate a whole-system approach that emphasizes the need to embed the innovation into routine functions [146-147]. The strategy also stresses the need for all healthcare providers to be part of the transformations required to enhance response to health risks. Additionally, extensive telehealth adoption requires robust operational networks, policies, and procedures that can be scaled up to respond to the rising population's needs. Therefore, there is a need for change management efforts to ensure everyone within the healthcare sector has the expertise required to respond to emergencies on time. Multiple resources are also essential to support response tactics, assemble the right infrastructure, and have a comprehensive framework at the local and national levels [148]. The absence of a robust strategy undermines the coordination efforts required to address physicians, patients, and the general public.

The gaps in implementing telehealthcare to respond to a crisis in the UAE context indicate additional findings. In this context, the research contributes additional knowledge on the need to adopt the technology during the restrictions, lockdown, and quarantine period. Promoting technology helps safeguard providers, patients, and the general population from an unknown pandemic's increasing challenges [149]. Drawing examples from different parts of the world reveals the need for extensive studies to enable the government to bring much-needed expertise to patients. Further, there are possibilities of experiences extending beyond the current situation. Telehealthcare is among the game changers that will protect the human population from health pandemics' adverse effects. The timely response through comprehensive adoption of telehealthcare is necessary to prepare the country for future issues.

3. METHODOLOGY

Data collection for the topic of how telehealth technologies can mitigate unknown risk during the pandemic was somehow challenging. Covid-19 was an unexpected pandemic that recently occurred, and not much research has been documented using Telehealth technologies as an alternative health care solution. Besides, several local hospitals were contacted to research their risk strategy; however, we were always told that the information is confidential. Moreover, some international Telehealth technology service providers were contacted via email through their website's information contacts to schedule interviews. However, most did not respond. Alternatively, online interviews and webinars were a useful source of information.

3.1 Data collection instruments

Primary data: The data collection instruments used were mainly quantitative data through online interviews and webinars with health professionals and health services companies' representatives. An interview was conducted with a representative from the management in a local hospital.

Secondary data: literature review conducted using articles, journals, information from audit reports, and health providers websites.

The data was analyzed through using excel sheets, content analysis, and narrative analysis.

3.2 Interviews

To have a full overview of the Telehealth technologies industry, interviews were conducted with representatives from different health care providers and hospitals nationally and internationally.

3.2.1 Organizations

- Philips Middle East:

Philips Enterprise Telehealth services and solutions is a technology company that is concerned with creating innovations that help improve human lives. Philips has developed several innovative solutions and technology-related devices to improve health care services.

The Telehealth enterprise is one of the projects that are led and tested by the company. The services are designed to be used in hospitals and at home. The focus of this research is the use of the ICU monitoring technique in hospitals.

- MeMD

It is a telehealth service provider based in the USA that offers comprehensive and customizable telehealth solutions to all community members. It primarily targets individuals and companies that require care for common injuries and illnesses. The interview was conducted on 1st July 2020 to assess the company's risk mitigation strategies: Jessica Taylor, the Chief Operating Officer of MeMD, was the guest interviewee.

- Virtuwell

An online-based health clinic offers modernized healthcare through a simplistic online platform that provides convenience to its clients by saving time and monetary resources. It provides a range of services for health issues such as sinuses, cough, allergies, women's health, sexual health, and kid's health. Carson English, the system administrator at Virtuwell, was interviewed on 2nd July 2020

- Amwell

It is an online-based health organization that enables health providers, insurers, and patients to deliver health care with access and affordability. It achieves this through the support of patients and clinicians by supporting them with appropriate tools to realize improved health outcomes. Jason Medeiros is the Chief Information Officer of Amwell, and he was interviewed on 1st July 2020.

- Intermountain Healthcare

Since this is a very recent topic with limited resources, the source of information is from secondary data and a Webinar organized by the US-based National Consortium of telehealth resources center on 19th March 2020 about Telehealth and. The webinar was hosted to provide information about developments on the telehealth programs during and a general introduction to telehealth to respond to the Corona Virus situation. Ten thousand people viewed the webinar.

The interview was done with Dr. Kerry Palakanis, Executive Director of Connect Care operations at Intermountain Healthcare in Utah, USA.

Dr. Kerry Palakanis started the webinar with an overview of the company. Intermountain Healthcare is a not-for-profit health system based in Utah, USA with 23 hospitals, 2,200 employed physicians and APC's, 3500 affiliates employed physicians and more than 185 clinics in the Intermountain Medical Group, a broad range of clinics and services, and health insurance plans.Intermountain Healthcare is a team of nearly 40,000 caregivers who serve people's healthcare needs across the Intermountain West, primarily in Utah, southern Idaho, and southern Nevada.

According to Dr. Kerry Palakanis, telehealth services were launched in the company in 2013, starting with 420 visits, 1300 access points, and over 500 providers using telehealth. "Intermountain Healthcare provides an advanced technological platform and seamless integrations that allows patients to get health services they require no matter where they live."

Dr. Kerry Palakanis is the Executive Director of Connect Care operations. Connect Care Pro brings Intermountain's world-class experts and high-quality care to patients, no matter where they are, so they can receive the right care, in the right place, at the right time using telehealth technologies. The goal is to keep patients in their communities whenever possible. However, if a transfer is needed, through the Connect care partnership program, partners provide the necessary support services to patients in coordination with other Connect Care Pro. The program has also been developed to meet small, rural hospitals where access to specialists is often limited.

Some of the other Intermountain virtual services

and programs include:
Critical care, crisis care, stroke, emergency department, connect care, urgent care, infectious diseases, nutrition, wound care, pediatric services, etc.
Moreover, Project ECHO (Extension for Community Healthcare Outcomes) is a collaborative medical education and care management model geared toward primary care clinicians in rural and underserved areas. These caregivers are linked to expert clinical teams led by Intermountain Healthcare providers via video. This allows front-line clinicians to obtain the knowledge and support they need to manage patients who have complex conditions.
The Tele-Critical care pharmacy program is developed to expand front-line pharmacists and other providers working in small and rural facilities to safely and effectively manage pharmaceuticals for critical care patients.

- Masafi Hospital

Masafi hospital is a government hospital located in Fujairah. Operational since 2007 and contains more than twelve sections with more than two hundred workers. Sheikh Khalifa honored it for remote areas. It is accredited by joint commission international accredits (JCIA) with a 98% score of achieving all international standards. Masafi hospital ranked the first out of 200 health institutions and organizations. The interview was conducted with Mr. Obaid Bin Khammas on 10th July 2020.

3.2.2 Risk Strategy, Mitigation, And Management
All providers identified that they do have a risk strategy and methodology in their organizations.
MeMD's primary risk strategy is risk reduction as it saves on the resources utilized in the management of risks related to telehealth services. Risk reduction is especially useful in the protection of the business against known risks that have definitive parameters. Notably, the strategy has also been effective in managing the COVID-19 health pandemic as it reduces the rate of infection due to the provision of health services to people from their homes (Klein, 2020).
During the interview with MeMD, Mrs. Taylor identified incorrect diagnosis as one of the significant risks that they face as an online-based company offering health services.
Amwell has adopted a risk strategy that primarily involves the transfer of risks that they encounter. This method has mostly worked well for them due to their connection with other credible stakeholders in health. They mainly assess the risks threatening the business and match them with other reliable organizations that can effectively help eliminate the risks. For instance, in the last few months, Amwell has been having an upsurge in the client requiring their services due to the changes influenced by the pandemic. Their principal risk has been effectively attending to their clients. They have approached this challenge by collaborating with some of their stakeholders to participate in some surplus clients.
Some of the technological tools that are highly utilized in the risk identification and implementation of responses include artificial intelligence and blockchain technologies, respectively. Jason Medeiros confirms that Amwell has a set of strategies for managing unknown risks, which entails managing crises as they occur daily, as it increases the rate of caution among the staff members. In controlling the pandemic, the organization has been continuously implementing the risk reduction and elimination strategies to integrate the necessary changes for optimal results.
According to Carson, Mr. Carson English from Virtuwell identifies that fraud and abuse were some of the significant challenges encountered at Virtuwell.
Moreover, Intermountain Healthcare's strategy is driven by industry-leading clinical experts and includes telehealth in care processes as a tool to accomplish clinical goals.
Like other companies operating telehealth services, securing patients' privacy is one of the main risks. Referring to an article published in the Health Affairs journal, "The success of telehealth could be undermined if serious privacy and security risks are not addressed. "For example, sensors that are located in a patient's home or that interface with the patient's body to detect safety issues or medical emergencies may inadvertently transmit sensitive information about household activities."
"Telehealth devices include mobile software applications (apps) in addition to the hardware. For a medical device to qualify as a Telehealth device, there must be a communication of health

information from the device over a network. This article focuses on network-enabled Telehealth devices where a device collects information from the patient (for example, measuring a function of the body or scanning the environment for safety risks) and then transmits data to a healthcare provider. Without adequate security and privacy protections for underlying Telehealth data and systems, providers and patients will lack trust in Telehealth solutions." (Hall, J.L. and McGraw, D., 2014)

However, to realize telehealth technology's' full potential, patients and providers must trust Telehealth systems to keep personal information private and secure. Patients give consent for having a device or sensor installed, or for using a health app. However, patients frequently do not read or fully understand privacy policies.

Moreover, "The Health Insurance Portability and Accountability Act (HIPAA) is one of several sectoral federal laws designed to implement these principles. Current laws, however, do not adequately cover the Telehealth environment." to crisis services, to identify and navigate high-risk periods.

Moreover, the company is looking into raising its information security measures. According to their risk assessment report, the report highlighted a lack of consistency in the company's policies and procedures, which need to be addressed. Intermountain decided to hire KPMG to work on its risk assessment and audit.

For example, "Intermountain now will document several levels of data protection. Based on risk, the organization will determine how best to implement access monitoring, software and hardware intrusion detection, and data loss protection on servers and critical systems.

For instance, the risk analysis helps determine whether Intermountain passwords for specific systems should expire every 30, 60, or 180 days."

Securing medical data for patients is essential in health companies. "While its routine has been to conduct security risk assessments annually, last fall, Intermountain's leadership team decided to step up its risk analysis efforts. That's because they wanted to make certain that the organization could pass any possible HIPAA compliance inspection by the Department of Health and Human Services' Office for Civil Rights".

Referring to the same webinar organized by the US-based National Consortium of Telehealth resources center in 19th March 2020 about Telehealth; The webinar hosted Mrs. Mei Wa Kwong, the Executive Director in the Center for Connected Health Policy (CCHP) Mrs. Kwong leads the organization's work on public policy issues as they impact telehealth on the state and federal level. She is also the project Director for the National Telehealth Policy Resource Center.

It is known that in the USA, current laws do not adequately cover the Telehealth environment. Referring to the interview with Ms. Kwong, health insurance policies had to be adjusted and changed. For instance, the insurance eligibility policy mentions geographic locations and site limitations. They were all waived, and all geographical locations now qualify. Since in some states, the telehealth services are covered only within the same state. Intermountain Healthcare is working on extending the telehealth coverage to more states.

When looking into the risk in Masafi Hospital, since it is a significant government hospital, the risk in the hospital and the health sector is an integral part of the nature of daily work. There are many types of risks in the hospital. For example, the risk from the machines which contain very high voltage. The risk in the laboratories which contain chemical and thermal sources. Risks from the patients like the deliberate fire from the mental hospitals. The hospital environment is hazardous to health because of sick people who come from outside the hospital, mixed environment.

3.2.3 Unknown – Unknown Risk

Unknown risks are quite challenging to mitigate since the magnitude and effect of the business's risk is not concretely identified. Currently, most companies and industries have been affected by pandemic, which is an unknown risk. Mitigation of the effects caused by COVID-19 is challenging since it requires constant adaptation to its dynamics Invalid source specified.

However, when researching about the selected health providers, Telehealth technologies proved to have tangible results in mitigating unknown risk. This parts highlights the efforts of different companies and provides measurable results.

With strict social distancing and quarantine measures, telehealth was an ideal and safe alternative to health care services during that

period.

Dr. Kerry Palakanis from Intermountain Healthcare mentioned in the webinar how Intermountain healthcare leveraged telehealth during the Covid-19 crisis. With Intermountain, the following examples are measures that were taken at Intermountain healthcare:

- Converted 50% of the command center to COVID-19 Call center within 8-12 hours
- They took over all the Covid-19 screening calls in Utah. Tele-infectious disease specialist, tele-hospitalist, and command center personnel provided overnight services and command center proposal coordinating screening and care of Covid-19 cases and created a communication system in the command center where all the staff is working. together
- Moved 60 nurses to the telehealth call center answering an average of 3,000 calls a day
- Connect care virtual health care visits increased from an average of 150 visits per day to 350
- Since elective surgeries and non-urgent procedures were postponed, doctors have been seeing 30 -50% less patients.
- Redeployed/trained nurses and doctors from closed operations who are currently unable to work in their roles especially since elective surgeries have been canceled system-wide into telehealth to work in call centers and connect care service
- The rapid development of scheduled video visits technology to maintain follow up with patients
- Centralized a result management program
- "Only Flight service" of Intermountain Health owns six helicopters used to transfer Covid-19 cases.
- Used telehealth technology to provide health services to Covid-19 positive patients in hospitals to reduce risk factors
- Established a Covid-19 remote patient monitoring program due to the delay between the time of the results, such as monitoring patients' health and self-recording temperature to feel they are still receiving care while the test results are out.
- A virtual symptom checker and proving an online resource center and hotline
- The company established free emotional relief hotline for patients open seven days a week.
- Strict safety procurations, social distancing guidelines and hygiene measures for visitors and in-patient management such as screening, general care tips, frequent hand wash and procedural mask worn by all patients who present with a cough and fever before room placement, isolation rooms for positive cases and strict measures for ICU patients.

When analyzing Philips's experience, the unknown risk is dealt with by monitoring the success of the product if the technologies installed in the device. As the company "combines A/V technology, predictive analytics, data visualization and advanced reporting capabilities, delivered by Philips experts". That way, the company can improve the product's effectiveness and increase the success of the customer's usage.

How the risk is identified for the advanced ICU system (Telehealth technology):

- Standardization of System Goals
- Flexibility at the Hospital Level
- Reporting
- Benchmarking
- Staffing Assurance

Three critical ways we support besides staffing:

- o Extend current staff resources
- o Insulate from short-term staffing volatility.
- o Reduce burnout and increase retention

MeMD makes the great utility of the latest qualitative risk assessment tools to manage unknown risks affecting the business. The tools mainly aid in assessing the probability magnitude of effects and the costs required to mitigate additional risks. They primarily rely on nanotechnology and Telehealth services that are tailored to manage such risks.

Virtuwell has, for a long time, adopted the risk reduction strategy in which it strives to minimize the damage caused by a particular risk factor in their business. The pandemic has hurt their business. It has disrupted their normal operations forcing them to adapt to other methods that reduce the impact of the losses incurred in the process. It has achieved this by utilizing technological tools such as artificial intelligence, Telehealth technologies, and remote work by some partners (Spring, 2020). According to Carson, Virtuwell has dealt with unknown risks by integrating diverse risk management and strategic plans to reduce and

gradually eliminate the risks.

Mr. Jason from Amwell mentions that telehealth is affected by a breach of data as one of the main risk factors facing the organization. There has been no encounter of unknown risks in the recent past in the organization.

Covid-19 was an unknown risk that all industries and companies had to deal with. This could be an opportunity to start working on other unknown risks and resource management for the future.

In addition to that, when looking at Masafi hospital's experience in unknown risk, the hospital faced the first unknown risk experience in 2009, which is swine flu from the virus (H1N1). The hospital gained experience on how to deal with the crisis and the recent pandemic and how to be prepared for any unknown risk in future.

3.2.4 Other Technology Tools Used

When investigating other technologies used by different companies addressed, which also supported the risk management process, all companies used Telehealth services. Moreover, being pioneers in the health services sector, they all used Artificial Inelegance. For example, "Intermountain Healthcare has launched its Covid-19 Symptom Checker – a new free online, artificial intelligence (AI) powered tool available to the public on its website to help people assess their risk for Coronavirus, check for symptoms and recommend the most appropriate care required.

Moreover, Robots were also commonly used technology in companies. Philips health care and Intermountain healthcare have both used Robots in surgeries to improve accuracy and save time.

Furthermore, 3D printing is widely used now in healthcare providers. For example, Philips has been recently using 3D printing to create models to help radiologists understand patient anatomy that is difficult to visualize.

Also, Doctors at different Intermountain Medical Centers used 3D Printing technology in surgery's for example, 3D printer's detailed model of a child's heart to save her life, 3D kidney to help save a patient's organ during a complicated tumor-removal procedural.

Masafi hospital uses the technology of Medihealth technology, which is designed to be in the pharmacy with a quick response of collecting medicines according to the doctor's prescription from the Wareed system for each patient.

4. FINDINGS

- Telehealth technologies contributed to the health sector during the pandemic providing tangible results in mitigating unknown risks. With the unusual circumstances, Telehealth technologies were ideal for ensuring patients received the necessary medical care during the pandemic.
- Telehealth is a useful tool in response to unknown risks in the healthcare industry. The technology protects the public, physicians, patients, and their families against contracting infectious viruses.
- With Telehealth services, patients have access to the care they need no matter where they are. This is an excellent benefit for rural areas needing specialized medical care. The UAE should invest more in training medical staff and raising awareness on the benefits of Telehealth services. Collaboration with the private sector is essential in order to support the expansion of telehealth services.
- After Covid-19 and since the pandemic concerned health organizations the most, it would be essential that all health services providers revisit their policies, procedures, and unknown risk assessment strategies for the future, taking into consideration the safety measures implemented during Covid-19 such as social distancing, hygiene, and safety procuration.
- With the Covid-19 unexpected pandemic, some companies require to revamp its management and strategies and develop their technological infrastructure to use them to mitigate risks. Besides, improving R&D and investigating advanced technologies and best practices in healthcare such as advanced 3D printing and AI solutions.
- Telehealth is rapidly evolving using advanced technologies, mobile applications, and networking that holds explicit promises for improving health care. However, serious privacy issues are a risk. Protecting patients' privacy, sensitive data, and medical records are one of the most critical risks that health companies should investigate. With the increasing demand for telehealth and technology-based health services revisiting the security and privacy measures and setting

policies and procedures to govern the process is necessary. The success of telehealth could be undermined if strict privacy and security risks are not addressed.

- Not all insurance companies provide adequate coverage for telehealth services.
- Telehealth is increasingly recognized for its potential to offer cost-effective healthcare services, particularly benefiting rural areas. However, incorrect diagnosis always remains a risk.
- Telehealth services have significant potential in the UAE. However, the increased number of patients needing critical medical care, such as the high rates of cancer and heart diseases, is challenging.
- One of the challenges is to ensure that every household has the device and networks required to interact with providers.

5. CONCLUSION

In conclusion, Telehealth technology has been extremely beneficial for healthcare takers and potential patients during the pandemic. It proofed to be a useful tool in response to unknown risks in the healthcare industry.

The technology was widely used to protect patients and health practitioner's against health hazards and the Corona virus. Several healthcare sectors have used this technology, only with the crisis in hand; this technology has moved from being a luxury to be a necessity.

Telehealth technologies have a lot of benefits allowing us to redefine providing health services in the future. However, to upturn the benefit health practitioners need to be trained on using the technology and health providers needs to increase the awareness to patients on the advantages of the technology. The research highlights potential risks of the technology that service providers should tackle.

Based on the research findings, Telehealth technology has mitigated the risk of transmitting the virus mad exceeding the number of patients. It is a promising technology for improving health care services in the future.

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