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Review Article

AI-Powered Virtual Health Assistants: Transforming Patient Engagement Through Virtual Nursing

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ABSTRACT

The age of AI (Artificial Intelligence) is here, and it impacts every aspect of our lives. There was a time when AI was only a complicated technological word, but it has become an undeniable part of many different industries. Similarly, healthcare has witnessed significant transformation at the hands of AI as it has revolutionized patient care. It has changed the way healthcare professionals diagnose issues and design treatment plans. One of the biggest benefits of AI in healthcare is the emergence of virtual health assistants, who have played an essential role in increasing accessibility to healthcare services. It's needless to say, people with mobility issues and senior people fail to get treatment because of unavailability. However, virtual health assistants are breaking this barrier by offering consultation, health monitoring, and treatment reminders on a virtual basis. In simpler words, it's ensuring the delivery of high-quality healthcare because it's more than a fancy hospital. It's about making healthcare available and accessible for everyone, irrespective of their location. So, with this book, we are focusing on how virtual nursing assistants are the future of the medical industry and how they will help improve the quality of healthcare for people who cannot visit hospitals. In addition to this, we will focus on how the healthcare industry can navigate through the potential security and data theft threats to ensure the reliable delivery of healthcare.

INTRODUCTION

I. THE RISE OF VIRTUAL NURSING ASSISTANTS

AI in healthcare is not a new concept because AI applications have been around since the 1970s. Those apps were used to treat biomedical issues. Ever since then, AI-centric apps have adapted and expanded to shift the dynamics of the healthcare industry. It has helped reduce monetary spending,

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improved patients' treatment results, and increased efficiency and effectiveness.

A. Historical Context: AI's Evolution in Healthcare

The first time the term "artificial intelligence" was used was in a conference proposal from Dartmouth College in 1955. But AI did not start being used in healthcare until the early 1970s when researchers made MYCIN, an AI program that helped find solutions for blood infections. There was more and more study into AI, and in 1979, the American Association for Artificial Intelligence was created. In the 1980s and 1990s, the creation of new AI systems led to medical progress that included:

- Making data collecting and processing faster
- Helping with more accurate surgeries
- Doing in-depth DBA study and mapping
- Using electronic health records in a wider range of ways

As it stands, the use of AI healthcare has been growing quickly over the past ten years, helped by successes in precision medicine. By 2018, 63% of healthcare companies polled had started machine learning projects that used cutting-edge tools like IBM's Watson. Early attempts to use AI for all stages of evaluation and treatment, on the other hand, were too ambitious. Adding AI to existing professional practices and healthcare IT systems has been hard and is still being worked on. Still, AI solutions that were specifically made for jobs like image analysis did very well. 74% of healthcare systems surveyed in 2021 said they used some kind of AI. A lot of money was put into AI in radiology, and companies now offer automated interpretation of everything from X-rays to MRIs. Because AI is so accurate, it has also made progress in oncology, neurology, heart, and other fields that depend on scan analysis.

B. Defining Virtual Nursing Assistants: Roles and Responsibilities

A virtual nursing assistant is not a robot that looks like a person and takes care of the patient. Who knows, maybe robots will become nurses one day. At the moment, virtual nursing assistants are apps, chatbots, and interfaces that are driven by AI and take care of any patient. Every day, virtual nursing assistants can get health information from patients. The doctor doesn't have to go see the patient in person to get information about their health. Virtual nurses can get information about a patient's health by using wireless straps and continuous tracking. Based on the symptoms, virtual nurse assistants can even figure out what the real problem is in the body. Their job is to send the health reports to the right doctor or therapist. The virtual nursing assistants can make doctor appointments as well as check on the patient's health. It's not just taking care of patients when working on the body. It's about getting regular information, looking at symptoms, making a map of growth, and more. The doctor or surgeon may need more time to do all of these things. Professionals in health care can save time with virtual nurse assistants and focus on the patient's most important needs. Because AI is used in healthcare IT, virtual nursing assistants have become possible. ML algorithms are also used to make virtual nursing assistants, along with AI (Artificial Intelligence) algorithms. The following are some of their jobs and duties:

a. Keep Up with Electronic Medical Records

This is because more and more healthcare groups are turning to technology to help them work faster and more accurately. As an example, healthcare virtual assistants can help keep up with or handle medical transcriptions through electronic medical records [7] , which are like digital patient charts that hold information like treatment plans and results of diagnostic tests. Keeping accurate and up-to-date medical information is an important part of giving good care to patients. In the past, these records were kept by hand, which meant that they were often wrong or inconsistent. Keeping records is easier and more accurate now that we

have EMRs. They also make it easy for people on the healthcare team to share information with each other.

b**. Taking Care of Patients Questions**

A lot of the time, patients have worries about their illness, their treatment plan, or their medicines. A VA can answer common questions or point the patient in the direction of places where they can find more information. A nursing VA can, for instance, tell you how to take your medicine or what side affects you can expect.

- **Taking notes during visits with patients**

So, the healthcare provider can focus on the chat, a VA takes notes while the provider talks to the patient. The VA types up the notes and gives them to the provider after the visit. This helps the provider remember important information and gives them a chance to read the messages again before writing their report.

• Appointments for Follow-up

After seeing the patient, the VA sets up any follow-up visits that are needed. This could mean setting up lab tests or imaging studies, refilling prescriptions, making referrals to experts, or scheduling follow-up appointments with the primary care provider. A VA takes care of these things so that patients can stay on track with their care plan and avoid gaps in care.

C. The Intersection of Technology and Nursing Care

The intersection of technology and nursing care can be deemed as digital health. However, there are a lot of gaps to consider. Digital health has empowered healthcare providers and nurses with tools that help them improve the quality of patient care and streamline processes. In addition, it has helped reduce costs. On the other hand, the patients are getting easier access to healthcare services and there are fewer communication issues with the healthcare provider. However, with the constant advancement of technology, nursing assistants will have to constantly train and adapt to the change. It will not only improve the quality of care but productivity as well.

II. CORE FUNCTIONALITIES OF VIRTUAL NURSING ASSISTANTS

Being a virtual nursing assistant seems like a huge responsibility. That's because they have to focus on providing pre- and post-treatment care, which isn't the primary responsibility of doctors. However, with the advent of virtual pathway, it's been challenging to understand the core functionality of virtual nursing assistants, which is why we are shedding light on it.

A. Symptom Checking and Initial Diagnostics

AI-powered diagnostics [8] use complex computer methods and machine learning to look at medical data and help figure out what kind of disease someone has. Large datasets and complicated algorithms are used in this technology to find patterns and correlations that may not be seen by standard diagnostic methods. Medical data, such as electronic health records, lab reports, imaging scans, genetic information, and even lifestyle factors, are put into an AI system as the first step in the process. The AI program can get more accurate as more data is added. The system then looks for patterns or trends in the data that could point to a certain disease or condition. AI's ability to keep learning and get better over time is one of the best things about using it for diagnoses. The algorithm can improve its diagnosis as more data comes in based on what it learns. Early detection of diseases is very important for making sure that patients get care on time and have better outcomes. Through progress in technology, artificial intelligence (AI) has become a useful tool in healthcare, especially for finding and stopping diseases. Machine learning methods are used in AI-powered diagnostics to look at a lot of data from different sources, like medical records, genetic information, and imaging scans. In this way, diseases can be found early by finding trends and oddities that human doctors might miss. One

of the best things about using AI to find diseases is that it can quickly and correctly process huge amounts of data. In other words, AI can pick up on small changes in a person's health over time, which could be a sign of a disease or risk factor. For instance, AI algorithms can look at mammogram pictures to find possible breast cancer tumors that people might not be able to see yet. Another huge benefit of diagnostics powered by AI is that it might be able to find rare diseases or conditions that are hard for human doctors to identify because they don't happen very often. AI systems can find unique patterns that point to a rare disease by looking at data from thousands or even millions of patients with similar symptoms or genetic profiles. This makes it easier to diagnose and treat the disease early.

B. Health Monitoring and Chronic Disease Management

It can be hard to live with long-term or chronic illnesses like diabetes, high blood pressure, asthma, or heart disease. It usually needs constant tracking, managing medications, and changes to the way you live [6]. However, standard healthcare models don't always give patients the support and ease of access they need to be involved in their own treatment. With AI devices like wearable tech or home monitoring kits and telehealth apps, you can keep an eye on your health on a regular basis. AI systems look at this real-time data and let healthcare professionals know about any trends or outliers that are troubling. This proactive method makes sure that help is given at the right time and helps avoid emergencies or trips to the hospital.AI has shown that it can be useful in managing a number of chronic diseases. When AI makes personalized treatment plans, for example, it uses genetic information and treatment records about each patient to make specially designed care plans. For someone with diabetes, this could mean getting a treatment plan that is tailored to their genes and way of life, which could lead to better results.

C. Medication Management and Adherence

It costs a lot of money to have problems with medications. In 2016, the overall cost of not-optimized medications and their effects was estimated to be $528 billion, which is 16% of all US healthcare spending [9] . Even though people mean well and are smart, they can't keep up with the growing administrative complexity of a healthcare system that is broken. For this reason, virtual nursing assistants can help with medication management and adherence in the following ways.

D. Getting Rid of Mistakes Related to Medications

Prescription mistakes happen all the time in healthcare, which is a shame because they can have bad effects or even be fatal. AI has the ability to greatly reduce these kinds of mistakes. Based on a patient's medical history, machine learning algorithms can look through and study huge amounts of data, find patterns, and guess what drug interactions or allergies might happen. This quick and easy review method lowers the chance of bad drug reactions, making sure that medications are managed more accurately and individually.

E. Improving Adherence to Medication

Not taking medications as prescribed can make treatment less effective and raise the cost of healthcare. Patients often have trouble sticking to their plans because the dosage instructions are too complicated, or they just forget. Apps that use AI can tell people to take their medications, make it easier to understand how much to take, and even keep track of how much they're taking, all of which can greatly improve adherence rates.

F. Helping With Personalized Medicine

Machine learning systems that use patient data like genetic information, lifestyle data, and disease history can help make very specific medication plans. This kind of personalization can make

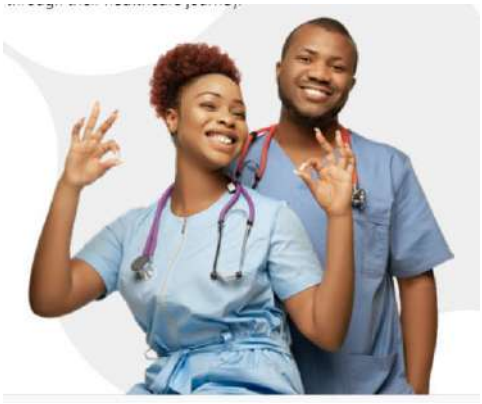
medicine work better and maybe even lessen side effects.

III. ENHANCING PATIENT ENGAGEMENT AND SUPPORT

The healthcare industry is undergoing constant evolution as new technologies are coming out. One of the best innovations is virtual nursing assistants [11]. They are trained professionals who offer clinical and administrative support. They can schedule appointments and streamline insurance claims. In addition, they offer healthcare education. All these factors help improve patient engagement and support.

A. 24/7 Accessibility and Its impact on Patient Care

As committed and well-trained professionals, assistants have the skills and knowledge to help healthcare practices with a range of administrative and customer service tasks from home. Their jobs include making appointments, registering patients, checking insurance, coordinating medication refills, and following up with patients after their visits. They do these chores so that healthcare providers have more time to focus on giving the best care possible and making sure that patients have a smooth and easy experience. They can also improve the patient experience by making administrative chores easier, giving more personalized help, and talking to each other better overall. Virtual nursing assistants can make care for patients a lot better by interacting with them in a way that is unique to their needs. In the end, this makes healthcare more responsive and caring. The nursing VAs also offers a wide range of support services by listening to patients' worries, answering their medical questions, and guiding them through their healthcare journey.



B. Personalized Patient Communication

It is important for healthcare professionals to be able to communicate clearly, and virtual medical aids can help with that. They can quickly answer questions from patients, make sure that texts between patients and providers get to the right people, and make sure that important data gets to the right people at the right time. They can also help set up telehealth and remote consultations, which can improve patient happiness and make care more accessible. AI makes it possible to look at very big sets of data, like medical records and genetic data. Because of this, it makes it easier to make personalized care plans and interactions. AI and Big Data analytics are often used in the methods to make it easier to predict and treat diseases. Because of this, it's easy for the healthcare providers to change how they talk to the team.

C. Empowering Self-Management

The healthcare system is at a turning point. A growing number of chronic illnesses, an older population, and a lack of doctors and nurses are all putting more stress on public resources. This change can be seen in how the healthcare industry interacts with people before they become patients, how patients are cared for and watched at home, how doctors work together, and how earlier diagnosis saves lives. Healthcare organizations all over Europe are facing these problems. Today, people in Europe can expect to live an average of 78.5 years, and new technologies are changing the

way health is done. In the next few years, cloud computing, data, and artificial intelligence (AI) will change the way medicine is done.

• Use of Virtual Buildings for Healthcare Access

Putting patients first should mean giving them new tools that not only make their lives better but also allow for more personalized care. Patients can keep an eye on their health and talk to doctors from the comfort of their own homes through virtual hospitals, which are handy and easy to use. This saves patients time and travel, which is especially helpful for older people. The Virtual Health Village at Helsinki University Hospital in Finland is a great example of how healthcare can be brought directly to patients. The online cloud service, which is built on Microsoft Azure and Dynamics 365, gives patients information and help, such as medical care, and gives healthcare professionals tools. People with certain conditions can go to virtual buildings that are designed to help them with things like pain management, therapy, mental health, and weight management.

• Treatment for People with COPD

Chronic Obstructive Pulmonary Disease (COPD) [4] affects 1.2 million people in the UK and is the second most common reason people are admitted to the hospital in an emergency. In Scotland, technology is making it possible for people with COPD to get personalized care. The symptoms, which include shortness of breath, chest infections, and a cough that won't go away, get worse without care. But a new trial gives patients an easier way to deal with the illness from the comfort of their own homes. Wearable tech and Microsoft's Azure cloud platform are used to keep an eye on patients' breathing from afar. Then, AI systems based on machine learning are used to keep an eye on the results and automatically find and predict problems. This lets doctors change the patient's treatment based on their specific needs. Practitioners can use technology to do what they do best: care for patients and keep problems from happening. This can help patients feel better and sometimes stop problems from happening in the first place.

IV. INTEGRATING VIRTUAL NURSING ASSISTANTS INTO HEALTHCARE SYSTEMS

The healthcare industry is undergoing constant evolution as new technologies are coming out. One of the best innovations is virtual nursing assistants. They are trained professionals who offer clinical and administrative support. They can schedule appointments and streamline insurance claims. In addition, they offer healthcare education. All these factors help improve patient engagement and support.

A. Technical and Operational Challenges

Even though AI-enabled solutions have a lot of potential, they are still not widely used in healthcare settings. AI technology has other technical and scientific problems besides problems with privacy. This is what AI in healthcare does not do well:

• Privacy and Safety of Data

Making sure that patient data is safe and private is one of the main worries when healthcare professionals use virtual assistants. To keep private patient data safe, medical practices need to use strong data security measures like encryption and access controls.

• HIPAA Compliance

Medical practices must make sure that virtual helpers follow the rules set by the Health Insurance Portability and Accountability Act (HIPAA). To stay in line, VAs should sign Business Associate Agreements (BAAs) and get HIPAA training.

• Technical Integration

It can be hard to add virtual helpers to healthcare systems and electronic health records (EHR) that are already in place. Medical practices need to spend money on technologies that make it easy for VAs to connect to their present systems so that data can be shared quickly.

• **Natural Language processing (NLP)**

NLP [1] skills are necessary for virtual helpers to work better. It can be hard to become a virtual assistant who can understand medical jargon, accents, and different languages.

• **Customization**

Every medical practice has its own needs and ways of doing things. To have the most effect and work as efficiently as possible, virtual assistants need to be customized to fit the needs of the practice.

• **Training of Doctors**

Some doctors may be hesitant to use virtual assistants because they think they will take the place of human relationships or make their daily tasks more difficult. To get doctors to use VAs as useful tools in their work, they need to get the right training and education.

• **Regular Maintenance and Updates**

To stay up to date on the latest medical information, industry rules, and AI technology developments, virtual helpers need regular maintenance and updates.

• **Measuring Success and ROI**

Medical practices need to come up with clear ways to measure the success of using virtual helpers and their return on investment. For long-term planning, it is important to look at how VAs affect patient results, the efficiency of administration, and cost savings.

B. Ethical, Privacy, and Security Considerations

When AI is used in healthcare, a lot of private information about people must be collected and processed. People are worried about what this data is being used for, who can see it, and how it is being kept safe. Making sure that the right protections are in place to keep patients' privacy and security is very important. As AI systems are used more in healthcare, it is important to set clear rules for who is responsible for what and how they are used. This includes making sure that healthcare workers are properly trained and supervised in how to use them and that patients know how decisions are made. There are a number of steps we can take to lessen the social problems that might come up when we use AI for healthcare. We can use AI in a smart and moral way with the help of these steps.

• **Strong Data Control**

Encrypting data, controlling who can access it, and storing it safely are some of the steps that need to be taken to protect patients' privacy and security. Making sure that patients' rights are protected also means setting clear rules and guidelines for sharing and using data.

• **Talking about Justice and Bias**

To keep errors from spreading, it is very important to make sure that AI systems are built with a wide range of data that represents the whole population. Regular checks of AI systems can also help find and fix any flaws that may appear over time.

• **Consent with Knowledge and Patient Freedom**

Patients should know everything about how AI will be used in their care and be able to choose not to take part if they don't want to. Also, healthcare workers should make sure that patients don't depend too much on AI systems and that they have control over their care.

• **Being Responsible and Clear**

Setting up clear lines of responsibility and openness for the use of AI in healthcare, such as making sure that healthcare workers are properly trained and supervised in how they use them.

• **Monitoring and All-Time Evaluation**

AI systems can help find and fix any ethical problems that may come up over time by being evaluated and watched over on a regular basis. This includes checking AI algorithms for bias on a regular basis, keeping track of how patients are doing, and asking patients and healthcare workers for feedback. Overall, reducing the ethical issues that come up with AI in healthcare needs a multifaceted approach that includes strong data

governance, addressing issues of bias and fairness, patient autonomy and informed consent, accountability, and transparency, as well as regular monitoring and review.

V. THE ECONOMIC AND SOCIAL IMPACT

While there are a lot of benefits to integrating AI, many of us don't focus on the economic and social impacts of this integration. For this reason, we are shedding light on it.

A. Cost-Effectiveness and Healthcare Savings

In today's world, being able to correctly and precisely use the power of data makes it easier for almost every business to make decisions. This is also true for healthcare. AI-powered systems will be able to look at a lot of data as healthcare providers move toward a standard way of keeping track of patient results. These systems will be able to look at trends in treatment results and find the best treatments for each patient based on their individual profiles. As a result, AI makes it easier for doctors to make decisions and makes sure that each patient gets the right treatments and solutions. This makes care more personalized. Right away, outcomes will improve dramatically, which will get rid of the costs that come with problems after treatment, which is one of the main things that drives up costs in most healthcare systems around the world.

- **Cutting costs through Early Diagnosis**

AI-enabled devices can do simple, repetitive tasks more correctly, like processing CT scans and some tests. This helps doctors make fewer mistakes, make diagnoses, and take action faster, before things get worse. AI has shown that it can read and understand scans much more accurately and faster than humans, which means that breast cancer can be found much earlier than in humans. Spinal fractures are an early sign of osteoporosis that doctors often miss when they do the diagnosis by hand. Recognizing these fractures can greatly reduce the cost of treating conditions like osteoporosis.

- **Empowering the patient**

With the help of artificial intelligence, we can actually make better choices about our health. A lot of people all over the world are already using wearable tech to track things like their heart rate and how much they sleep. By using machine learning to look at this data, people who are likely to get certain diseases could be warned about them long before they get worse.

With the help of mobile apps that give detailed information about each patient, people with certain chronic diseases may be able to better manage their illness and live healthy lives. All of these things could make people healthy and lower the overall costs.

- **Better Accessibility**

Figuring out what to do, gathering facts, and weighing possible solutions are all steps in the process of making a choice. A staged decision-making process can help you make better, more thoughtful choices by giving you time to gather important information and think about your options. The availability and accuracy of the data that is used to make decisions are very important in today's digitalized healthcare setting. In healthcare, where clinical decision-makers face many challenges and issues along the patient route, adding smart data can make a big difference and help make better decisions. Complex decisions in healthcare may not be made because data is not available or is too big to look at, information is missed, or suggestions are not taken into account. This can lead to inefficient and expensive processes and worse clinical results.

B. Global Market Trends and Future Outlook

AI that's supporting patient support, diagnosis, and treatment is already being used all over the world. However, how we embrace AI integration in healthcare is changing. In particular, in the next 10 years, we will be able to create a more

responsive system. So, with this article, we are sharing five trends that have encapsulated AI healthcare.

1. AI-Centric Devices

Deep learning and neural networks are used by AI-powered devices to do many human jobs, such as identifying and predicting diseases, sorting data, studying disease outbreaks, improving medical treatment, and helping with diagnosis. Neuronal networks are used in deep learning methods [5] used in medical devices because they can recognize patterns like the human brain. After being given data, these machines learn in ways that are similar to humans' without being told to. One great example of this is the app Sugar.IQ. It was made and released by Medtronic, a company that uses artificial intelligence to improve healthcare by making AI-powered gadgets. This app uses AI to help people with diabetes take care of their situation so they can live a better life. It found actions linked to glucose patterns, sent personalized messages, and helped people understand how different foods affected them. Sugar.IQ checks blood sugar levels all the time by looking at a lot of data from Medtronic's glucose devices and insulin pumps.

2. AI in Telemedicine

Telemedicine is the use of digital communication tools to provide medical care over long distances. AI makes it easier for people to get medical care, especially in remote areas that aren't well served. Using AI in telemedicine can help with a lot of different things, like managing chronic conditions, providing mental health services, and providing basic care. Here are some specific use cases:

• Telemonitoring:

Checking vital signs, finding problems early, and figuring out which patients are most likely to get certain illnesses are all part of monitoring patients from afar.

• Expert Opinion:

When doctors use telemedicine and AI together, they can diagnose patients and give them advice based on their medical records and present diagnoses.

- **Treatment Plan:**

AI can make personalized treatment plans for each patient based on their needs, medical history, preferences, type of care, and location.

• Engaging patients:

Patients can use chatbots and virtual assistants to help them remember their meetings and follow-up care, and they can also get answers to common questions.

• Chronic Disease Management:

AI helps with the control of diabetes, high blood pressure, and heart disease by giving patients helpful reminders and feedback.

3. AI in Genomics

Genomic research can be used in many different ways, from sequencing the DNA of critically ill people with rare diseases to studying genetics in whole populations. But this technology needs a lot of computing power and knowledge of data science to understand the results. That's one reason AI is so important in genetics. A lot of genomic data is analyzed by AI tools to help with breakthroughs and personalized medicine. Here are some ways that AI is used in genomics:

- **Genomic Data Analysis:**

AI-based methods for analyzing genomic data are faster and more accurate generally than more traditional approaches.

- **Custom Medicine:**

Scientists and doctors find specific genetic changes that are linked to diseases by analyzing genomic data. With this information, doctors and nurses can then give more effective individual treatments.

• Clinical genomics:

Diagnostics, prognostics, and treatments are all examples of current clinical genomic uses that use AI.

4. AI in Robotic Surgery

Surgical jobs need to be done over and over again with great accuracy, which can be hard for surgeons. Surgical robots that help doctors with a variety of tasks have been made possible by progress in AI and collaborative tools [3]. These robots have very exact control over their path, speed, and depth of movement. This is especially helpful during processes that need to do the same things over and over, which could make the person tired. Surgical robots can also stay still for as long as they need to. For example, being able to repeat exact movements is helpful during hair transplant surgeries. This technology also cuts down on the average time people have to wait for treatments, lowers the risk, and lowers the chance of complications and side effects. On the other hand, AI gives surgeons real-time knowledge about how a patient is doing, which helps them make smart choices before, during, and after procedures.

VI. LOOKING AHEAD: THE FUTURE OF VIRTUAL NURSING

When you look at the numbers and trends in the healthcare business, it's clear that virtual nursing assistants have the potential to change things. Because of the COVID-19 pandemic, more people are using virtual care and telehealth services. This has caused a 41% increase in the need for virtual medical aides. The CMS also says that telehealth visits rose to $26 million for primary care specialists and $10.1 million for mental health specialists. This move toward virtual care shows that virtual medical workers could help provide high-quality healthcare from a distance. Virtual assistants are becoming more popular because of investments in digital health technologies. The State of Digital Health 2021 Report from CB Insight says that investments in digital health reached a record-high $57.2 billion in 2021. This is a 79% increase from the $32 billion mark that was raised globally the previous year. This influx of investments shows that people are optimistic about the growth and promise of virtual nursing assistants to make healthcare more accessible and better delivered. VAs have a bright future in healthcare, as shown by the numbers that show how much they could help. Virtual assistants have the potential to change the healthcare industry by making it easier for people to get care, making it more efficient and cost-effective, giving more personalized care, and helping healthcare workers. They are a hopeful way for medical practices in the US to deal with the problems they face because they use technology to get around geographical barriers, make the best use of resources, and put patients' needs first.

A. Potential Technological Advancements

• Nursing Robots

Nurse robots [2], which are also called medical robots, are a new type of nursing technology that has the potential to change the healthcare business. They can help nurses by doing boring or hard tasks. Most of the time, these robots come with advanced sensors, cameras, and communication tools that let them have real conversations with patients and medical staff. They can be used by healthcare groups in a number of places, such as hospitals and senior homes..

• 3D Printer

A 3D printer uses a special machine to make a digital model of an object and cuts it into thin layers. Each layer is printed on top of the previous one until the whole object is made. In the medical field, an imaging process like a CT or MRI scan can make a digital model, which is then sent to the printer to be made. This makes it possible to make many complicated items on-site, which saves time and money.

B. Preparing for a Transformative Future in Healthcare

To use AI in healthcare [10], you need specialized skills like being able to analyze data, write code,

and make software. To use and talk to AI tools and systems, you don't need to be an AI expert, but you do need to know a few basic things about them. To get ready for AI to be used in healthcare, you need to improve your technical skills. You can do this by joining communities and networks, taking online classes, or reading books and articles. You should also stay up to date on the newest ideas and trends in AI and healthcare by going to events, workshops, or podcasts. The following steps can be taken by healthcare groups that want to use AI in their work:

• **Start out small**

Fix a real problem in the company instead of wanting something new and shiny. There's a better chance that it will be used in a particular situation. It's even better if it meets a budgeted need and has a clear return on investment (ROI). This makes it more likely to get supported.

• **Don't think of point answers as solutions rather than platforms**

There are AI tools that are very good at one thing. However, businesses will need to use a platform method if they want to lay the groundwork for more AI use in the future. At the moment, a number of healthcare organizations use AI-powered tools to help with administrative chores and some clinical decisions. Clinicians can focus on their patients and work at the top of their licenses when they don't have to do as much paperwork.

CONCLUSION

The use of virtual nursing assistants has surely changed the healthcare landscape because it's changing the way we provide patient care and support. The use of Machine Learning and Artificial Intelligence has empowered healthcare providers to increase the quality, effectiveness, and efficiency of healthcare services. The virtual nursing assistants help monitor the patients' vitals and provide on-time reminders for medication. While it's delivering a lot of benefits for patients, the nurses will be able to save time and focus on other complex aspects of patient care, leading to an exponential improvement in healthcare outcomes. Looking forward, to ensure the seamless integration of virtual nursing assistants in the healthcare system, we need to fix the technical challenges and refine algorithms. In addition, the database needs constant updating. For this reason, there is a need for collaboration between healthcare professionals, policymakers, and tech experts to create standards for the ethical use of AI.

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