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Developing a Strategic Framework for Effective Implementation of Telemedicine in the follow-up of adult patients with chronic conditions in Primary Healthcare Centers in Al Dhahira governorate, Oman: A qualitative study.

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Abstract

With regards to follow-up treatment for individuals with chronic diseases, telemedicine is a game-changer. The purpose of this research is to investigate how patients and doctors feel about using telemedicine for monitoring long-term health conditions. Fourteen individuals were included in the trial and got telemedicine treatments through telephone conversations for a variety of chronic diseases. Seven doctors were also questioned to get the healthcare provider's point of view. This included both senior consultants and ordinary practitioners. The results showed that patients were open to the notion of utilizing telemedicine for follow-up treatment because of its many benefits, including more convenience, shorter wait times, and the possibility to eliminate transportation issues. In particular for managed chronic patients, doctors have seen telemedicine improve satisfaction, compliance, and follow-up visits. However, both patients and doctors noted that there were obstacles, such as wrong contact information, nervousness over first meetings, and unreliable internet connections. From a technical standpoint, it has been determined that reliable internet connectivity and the protection of sensitive patient information are essential for the widespread use of telemedicine. It was also noted that administrative variables, such as IT assistance and training for healthcare personnel, are critical to the success of telemedicine services. Improved patient involvement necessitates addressing sociocultural variables including patients' willingness to be contacted by male physicians. In order to improve communication and patient comprehension during telemedicine sessions, the research suggests implementing a clear telemedicine guideline, educating patients on the advantages of telemedicine, and standardizing telemedicine practices. A better understanding of telemedicine in chronic illness follow-up might result from future study with a bigger and more diversified sample, encompassing several healthcare facilities. Furthermore, expanding our knowledge of telemedicine's potential in healthcare would be aided by investigating the effects of various telemedicine modalities, such as video consultations and remote monitoring.

Keywords: Telemedicine, primary healthcare, healthcare accessibility, digital Health, technology integration, chronic conditions, strategic framework.

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Introduction

1.1 Background and rationale

In recent years, telemedicine has shown promising results in bridging the healthcare access gap for those with chronic health conditions. Long-term management of conditions including diabetes, hypertension, and cardiovascular disease requires regular visits to primary care clinics. Many adults are denied timely and accessible treatment due to factors such as distance, transportation challenges, and a dearth of healthcare providers in rural areas. Telemedicine, the remote delivery of healthcare via the use of ICTs, has the ability to overcome these challenges (AlAhmad et al., 2021). However, there is still room for improvement in the use of telemedicine for the monitoring of persons with chronic illnesses in the primary care context. However, a thorough strategy framework that accounts for the particular difficulties of this environment is lacking in the literature on telemedicine deployment (Peyroteo et al., 2021). To better serve individuals with chronic illnesses undergoing follow-up therapy in primary care clinics, this qualitative study aims to develop a strategic framework for integrating telemedicine into existing care delivery models.

1.2 Telemedicine in Primary Healthcare: An Overview

Treatment of long-term conditions, such as diabetes, hypertension, and cardiovascular disease, falls under the umbrella of "chronic care management," an

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integral element of primary care. Chronic care management stands to benefit greatly from the implementation of telemedicine, which makes use of digital technology to provide medical treatments to remote patients. However, a number of issues must be addressed for telemedicine to be effective in this setting (Beheshti et al., 2022). The "digital gap," the disparity in people's access to the internet and other digital resources, is a major issue. Patients who lack the technological literacy to benefit from telemedicine may have difficulty doing so. The use of digital technologies in healthcare may raise concerns about patient privacy and safety. Another issue with using telemedicine for long-term care management is the requirement for healthcare staff to acquire new knowledge and practices (Wang et al., 2021). It has potential for more efficient and fair long-term care administration, as well as improved patient health outcomes.

1.3 Existing Frameworks and Models for Telemedicine Implementation

As telemedicine assumes an increasingly important role in healthcare, there is a need for constructing a strategic framework to make it effective and efficient. Telemedicine introduces lots of players and new technology, so coordination and communication are essential. As a result, strategic frameworks must detail roles, responsibilities and implementation plans (Stachteas et al., 2022). A strategic framework aligning telemedicine with overall healthcare goals reaffirms that a wider connection to broader health care objectives is essential. These include expanding access and improving patient outcomes (Correia et al., 2019).

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1.4 Research aim

The aim of this research is to develop a strategic framework for the effective implementation of telemedicine in the follow-up of adult patients with chronic conditions in primary healthcare centers.

1.5 Research objectives

The following are the objectives of this research:

1. To better understand the barriers that exist between doctors and their adult patients who are receiving follow-up care through telemedicine.
2. To identify the factors those facilitate the successful implementation of telemedicine services in primary healthcare centers.
3. To develop a strategic framework for the effective implementation of telemedicine in the follow-up of adult patients with chronic conditions in primary healthcare centers.

1.6 Research questions

The following are the research questions to be followed for the project at hand:

1. What difficulties do doctors and patients have when using telemedicine visits to monitor adults with ongoing health issues?
2. What are the factors that facilitate the successful implementation of telemedicine services in primary healthcare centers?

1.7 Significance of Study

This research is important because it may lead to better treatment for people with chronic diseases by demonstrating how to integrate telemedicine into primary care

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settings. This study's overarching goal is to improve the utilization and efficacy of telemedicine in the follow-up care of adult patients with chronic illnesses by comprehending the barriers faced by physicians and patients, elucidating the factors that facilitate successful telemedicine implementation and developing a strategic framework. There are a number of potential applications of this study's results. In the first place, it may help educate healthcare professionals, legislators, and administrators on the most important considerations for introducing telemedicine services into primary care.

1.8 Summary

The purpose of this introduction is to introduce the reader to the study issue, which is the design of a strategic framework for the efficient use of telemedicine in the ongoing treatment of adults with chronic diseases in primary healthcare settings. It describes the study's context and justifications, focusing on how telemedicine has the ability to help people with chronic diseases get the medical treatment they need from afar. The difficulties and complications of telemedicine implementation, as well as the need to match it with larger healthcare objectives, are discussed in the introduction. The study's purpose, sub-goals, and questions are outlined below for readers' reference.

Literature Review

2.1 Telemedicine in Primary Healthcare Centers

Telecommunications technology revolutionizes healthcare delivery, particularly primary health care systems all over the world. Its integration comes from

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technical development and the need for convenient medical services. Telemedicine makes it possible for doctors to treat patients beyond geographical boundaries, bridging spatial limitations (Mathur et al., 2017). This real-time connectivity has used video conferencing and encrypted messaging, making it especially valuable for the follow up of chronic disease victims. That way health quality is improved while access to care expands (Mihalj et al., 2020). Chronic diseases like diabetes and cardiovascular disease cost people their lives, deteriorate health systems. A viable alternative telemedicine comes into being with reductions in time and associated costs of going for repeated checks, particularly helpful for those from underserved regions who are lacking or debilitated. Still, widespread implementation of telemedicine in primary healthcare requires the ability to overcome hurdles that include a lack of infrastructure and uncertainty about payment methods, as well changing patients 'attitudes (Mahajan et al., 2020).

2.2 Definition and Conceptual Framework of Telemedicine

On the heels of modern communication technology comes telemedicine, which can provide a wide variety of medical services from anywhere. Thanks to telehealth, patients can receive consultations and so on from home without having to leave the house. Communication technologies such as video conferencing, encrypted messaging, electronic health records and telehealth are the skeleton. These break through time and space constraints (Alharbi et al., 2021). The three elements of telemedicine are health care delivery, data sharing and communication. But the crux of its success is that it works through reliable and secure communications

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between medical professionals far from one another, encompassing video or audio chats, instant messaging, and even virtual reality-based encounters. Computerized or electronic health records, digital imaging and telemonitoring facilitate accurate diagnosis, treatment planning and continuous monitoring (Flores et al., 2019). Telemedicine is one of the most important approaches in healthcare delivery. It allows for a variety of clinical services to be delivered at a distance, such as medical assistance and discussions on diagnosis or treatment plans.

2.3 Evolution and Advancements in Telemedicine Technologies

Technological progress has caused telemedicine to become a genuinely legitimate alternative for medical professionals as well as patients. High-speed network connections and broad use of mobile devices have greatly increased the functionality of telemedicine tools (Batista et al., 2016). This allows for smooth transmission of medical data and immediate interaction between healthcare providers and patients. With video consultations, encrypted communications and remote monitoring becoming more commonplace as online interfaces grow ever closer to home, face-to-face interactions are possible merely by tapping away at the keyboard. Distance no longer matters. High-definition video, high quality audio capabilities and the addition of collaborative features have enabled further improvements in both the efficiency and effectiveness of virtual consultations. But remote monitoring tools and wearables also provide real-time tracking of such vital signs as blood pressure, glucose levels, heart rates and sleep patterns to the convenience of patients with chronic diseases (Li et al., 2017). EHR integration is

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important because it means that when doctors use telehealth to visit with patients, they have ready access not only to medical records but also laboratory findings and imaging reports. ML and AI have now become key tools in telemedicine, providing insight that assists diagnosis, prognosis and decision-making efficiency (Maroju et al., 2023). Simple mobile apps and telemedicine platforms bring down the barriers to consultation, allowing patients access to a wealth of medical information, enabling secure messages between doctors and ordeal, all in preparation for their next consultation. These advances have extended telemedicine's scope and function, revolutionizing the healthcare delivery scene.

2.4 Benefits and Advantages of Telemedicine in Follow-up Care for Adult Patients with Chronic Conditions

Adults with chronic diseases have many advantages in telemedicine. Secondly, it makes things more convenient. In particular for the elderly or disabled, for those in rural areas where transport options are limited and visiting health care facilities is cost prohibitive (Al-Kuwari et al., 2020). The virtual appointment allows patients to receive consistent treatment, without losing work or making travel arrangements. North (2020) points out that telemedicine can help improve care coordination and interdisciplinary teamwork among healthcare providers, making it easier for them to exchange electronic health data securely. Patients control their treatment with monitoring gadgets at home, constantly reporting to doctors on how they feel and what treatments are being taken. Patients are able to make informed decisions, thanks to educational materials provided by telemedicine platforms

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(Sarti et al., 2020). This helps early intervention and identification, improving patient outcomes, reducing complications and hospital readmissions. In addition, telemedicine relieves pressure on hospitals and clinics, reduces patients 'visits to out-of-town institutions (reducing medical travel), or contributes to lowering the number of emergency room visits through effective management of chronic illnesses.

2.5 Barriers and Challenges to Telemedicine Implementation in Primary Healthcare Centers

Despite the potential for improved healthcare delivery, barriers exist in primarycare centers. Healthcare professionals 'resistance due to worries about the quality of care and traditional practice models is one major obstacle (Lilly et al., 2017). But such education and training programs are needed to teach providers about telemedicine tools. Given the challenges of technological infrastructure, limited internet access and poor connectivity in remote areas limit it's effectiveness. Investment is still needed in telecommunications (Das and Gonzalez, 2020). Data security and privacy are also serious obstacles, however. Encryption protocols are required to be strong enough to prevent snoopers from decoding the records (Waller and Stotler 2018), as well as meeting applicable regulations such as HIPAA. To encourage large-scale adoption of sustainable telemedicine, policymakers must develop reimbursement policies and remove financial barriers (Lott et al., 2022). There are also patient acceptance and digital literacy problems, which require education campaigns, user-friendly interfaces as well as support to

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encourage more engagement from patients (Abd Ghani et al., 2018). Breaking down these multifaceted obstacles lies at the heart of successful telemedicine implementation.

2.6 Physician Perspectives on Telemedicine Adoption and Utilization

Primary care telemedicine has received attention, and physician opinion is essential to a successful implementation. Improving patient access to healthcare, convenience because patients don't need physical visits and improving the state of mind both for doctors themselves and thus promoting mental health awareness can be expressed as being benefits physicians see (Royce et al., 2020). Chronic disease patients, for whom telemedicine offers the ability to monitor over time, are especially likely to see their overall health outcomes improve (Barros-Tornay et al., 2021). But barriers exist for clinicians, such as lack of education on telemedicine methods and problems with technical infrastructure. It is necessary to undergo training in virtual consultations, the operation of the platform and effective communication with patients. A reliable internet, secure communications platforms and electronic health records systems are important for effective telemedicine services. Incompatibility of the technology with existing medical terminology is one factor limiting deployment (Chellaiyan et al., 2019). In telemedicine physicians must maintain good communication with patients and show sufficient humanity. Telemedicine use needs to be expanded by extending payment rules for enough reward, integrating telemedicine into current workflows and creating

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interoperability with electronic health records systems so that the two ends can run together.

2.7 Patient Perspectives on Telemedicine: Acceptance and Satisfaction

The experiences and opinions of patients are the key to popularizing telemedicine. The practical benefits for hub patients outweigh the limitations, such as shorter wait times and reduced travel distances. It's especially good news for those with limited mobility or living in rural areas (Eberly et al., 2020). Convenience, avoiding wasted visits and flexible schedules are factors encouraging patients to choose telemedicine. Tozer et al. (2015) point to treatment quality as an important factor, and patient satisfaction depends on clear communication with caring healthcare practitioners who respond sensitively when solving problems. When telemedicine is convenient and technical assistance adequate, people's trust and satisfaction can be increased. This is necessary to gain patient trust, with sensitive securities mechanisms such as encryption and secure data transfers (Hasson et al., 2021). Education and awareness of patients are important factors. Clear instructions on how to find telemedicine platforms, with various technical assistance available can help relax the patient's mind and raise their confidence level. Feedback and assessment of patient satisfaction promote improvement in telemedicine services, with patients participating actively themselves the highest achievable level (Nies et al., 2021). Increasing the acceptance, engagement and satisfaction are particularly important areas that require patient-centered strategies in telemedicine implementation.

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2.8 Strategies and Best Practices for Successful Implementation of Telemedicine in Primary Healthcare Centers

In an earlier study, we found that primary healthcare telemedicine is easier to implement than remote telesurgery or other varieties. But successful implementation still requires careful planning and preparation by sites observing best practices. Healthcare professionals require thorough training that includes technical, ethical and legal aspects (Mohamed et al., 2015). Adaptation of current operating procedures, such as appointment and booking systems, strengthens work-flow efficiency and care coordination. A strong technological base, predicted by Nayak et al. (2016), consists of stable internet access together with secure and user-friendly telemedicine systems that provide technical assistance to its users. The importance of patient participation and education cannot be overemphasized; providing clear information about the advantages of telemedicine and how to partake in it, along with instructions that are easy for ordinary people to follow is critical (Thapa & Sein, 2018). Applicable laws and regulations, respect for patient privacy, informing the patients of their right to decline treatment--these are all important considerations. Feedback from doctors and patients also helps improve telemedicine effectiveness. Update from time to telemedicine has helped increase the speed of primary healthcare facilities thus greatly improving patient access and efficiency in delivering medical care.

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2.9 Regulatory and Legal Considerations in Telemedicine Practice

As for telemedicine practice, there are a variety of legal considerations essential to compliance and patient safety. During a telemedicine consultation, it is necessary to follow patient confidentiality norms ranging from HIPAA in the United States and GDPR in Europe (Parmar et al., 2015). Informed consent is an important legal element All patients must understand the advantages and disadvantages of telemedicine; electronic tools make it safe to give permission. Understanding telemedicine reimbursement policies and procedures-including billing codes needs constant attention, with changes made in time (Mihalj et al., 2020). In order to resolve the issues of concerns related to medical liability and malpractice, providers are required to maintain records up-to-date in slides and detailed during telemedicine meetings. It is important for one to monitor changes in telemedicine regulations, seek legal opinions as needed and share information through various professional organizations or through reading related publications. The proper understanding of the logic involved thus helps both one's own practice and other practicing physicians keep their bearings in terms of managing all these complex legally relevant aspects surrounding telemedicine they have been ordered into doing.

2.10 Ethical Considerations in Telemedicine: Privacy, Security, and Confidentiality

Widespread use of telemedicine also raises ethical issues, particularly those regarding patient privacy. Protecting patient privacy when transferring sensitive

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medical data across long distances is key in telemedicine (Mahajan et al., 2020). While encryption of communications channels and privacy standards like HIPAA are important in protecting patient information when it is transmitted, there has been a lack of research on how sensitive patients' personal data actually is (Alharbi et al., 2021). Such ethical considerations also include safety: appropriate security measures should be employed to prevent data leaks and unauthorized access. Firewalls, strict authentication methods and constant security audits are integral parts. (Mahajan et al., 2020) Ethics in telemedicine is therefore built upon patient privacy. To protect against abuse or loss, there must be a strict rule on how data should be stored and disposed of (Flores et al., 2019).

Methodology

3.1 Research Philosophy

Researching what makes telemedicine work, what obstacles doctors and patients experience, and how to overcome them would be guided by an interpretivist stance. Understanding and interpreting social phenomena and their associated meanings is central to the interpretivist approach (Crossan, 2013). Here, this means learning about how doctors and patients communicate and what roles each plays in the practice of telemedicine. The study takes an interpretivist approach in order to better understand the feelings and thoughts of those who use telemedicine.

3.2 Research Paradigm

For this investigation, we propose using a qualitative research methodology. Because of the in-depth insights it provides into the experiences and perspectives

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of study participants, qualitative research is well-suited to the investigation of intricate social phenomena. Qualitative research, which relies on in-depth interviews with participants, allows for a more complete understanding of the aspects that contribute to the success of telemedicine services and the difficulties that doctors and patients have while using them (Holden, 2004). This framework acknowledges that factors like setting, viewpoint, and the social construction of meaning all have a role in determining telemedicine in both practice and experience.

3.3 Research Approach

This study takes a phenomenological method to explore the understanding of doctors and patients in telemedicine consultations. Understanding genuine human experiences and the essence of phenomena is a research method based on phenomenology. Through face-to-face interviews one-on-one, researchers dig into the participants 'thoughts and views around telemedicine--perceptions, expectations or challenges (including problems), benefits. This research entails semi-structured interviews with a number of doctors and patients who have had telemedicine encounters. Transcripts which are transcribed verbatim, with the consent of participants, and thematically analyzed reveal common factors that lead to telemedicine successes. Through detailed inquiry, the researchers are looking to find answers for doctors and patients when they face problems using telemedicine technology (Bray et al, 2014).

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3.4 Research Strategy and Tools

Purposive and snowball sampling would be used as research methods in this study. Purposeful sampling entails recruiting people who have certain features or have had certain experiences that are pertinent to the study at hand. In this scenario, doctors and patients who are already familiar with telemedicine interactions would be chosen. However, with snowball sampling, a small group of people are selected and then asked to find others like themselves who fulfill the criteria. When researching an inaccessible or understudied group, this technique shines. In-depth, semi-structured interviews would be the major method of data collection. Through these in-depth discussions, participants are able to articulate their thoughts and feelings about telemedicine consultations.

3.5 Sampling Technique

Purposive sampling will be used for this investigation. Researchers may use purposeful sampling to recruit people with a range of features and experiences relevant to the study's focus. In this scenario, both doctors and patients would be selected on the basis of their prior use of telemedicine. The goal is to have a representative cross-section of the population in terms of age, gender, geographic region, medical subspecialty, and telemedicine experience. Working together with the primary healthcare centers may make initial participant selection easier. Researchers may find suitable subjects by collaborating with these groups to find individuals who satisfy the requirements (Donner, 2008). The number of potential contributors may be increased via the use of snowball sampling. After talking to

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the first set of people, you may ask them to recommend doctors and patients who have had positive experiences using telemedicine. People who would be difficult to sample in a more conventional way can be reached using this strategy.

3.6 Data Collection Techniques

The main data collection method is one-on-one interviews, which are carried out in person or over the phone. These semi-structured conversations seek to draw participants 'opinions, feelings and telemedicine problems. In order to obtain substantial answers, it is necessary that interviewers ask follow-up questions and explore further about each comment. Interviews are transcribed in accordance with the wishes of participants to get detailed information. By using both interview data and field notes, observation and validity are improved. Nonverbal cues and contextual information obtained in post-interview reflection supplements datasets which throw light on the factors associated with telemedicine effectiveness. This also suggests that both doctors and patients face obstacles to effective telehealth consultations (Donner, 2008).

3.7 Data Analysis Techniques

This is one example of a common qualitative data analysis method; thematic analysis involves transcribing interviews and identifying patterns by closely coding data subsets. Its process demands that preliminary codes be set up, categorized according to themes and then refined for accuracy of the particular theme. At the end, one must analyze themes and develop conclusions that are significant enough to be supported by quotations from interviewees (Braun & Clarke 2006).

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3.8 Reliability and Validity of Research

The dependability and credibility of qualitative research depend on its continued reliability and validity. Several methods would be used in this investigation. To begin, a method known as "researcher triangulation" would be used to increase trustworthiness and reduce biases in the data analysis process by having different researchers work on the same data set. There would be agreement on coding, themes, and interpretations if the researchers discussed their findings often. Second, a process called "member checking" would be implemented, in which interviewees would be given a chance to double-check the interpretations made based on their own examination of an extract or summary of their own interviews. Research is more credible when participants are given a chance to share their thoughts via member checking. In addition, an audit trail detailing the thought process behind every research-related decision, such as code choices, theme creation, and interpretation, would be kept (Hara, 1995).

3.9 Limitations of Research

While this research hopes to provide light on what makes telemedicine services possible and what obstacles doctors and patients experience, it is crucial to note that it has certain limitations. First, the results may only apply to the particular demographic or healthcare system in which they were first observed. A limitation of the research is that it only includes the opinions of a small subset of doctors and patients who have had telemedicine sessions. Second, the research is dependent on interview data provided by the participants, which may be influenced by biases

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such as memory bias and social desirability bias. Individuals may choose to only recall or share information that fits with their preconceived notions or what they believe to be the societal norm (Hara, 1995). To counteract this, we will make an attempt to connect with the participants on a personal level and foster an atmosphere where they feel safe enough to be themselves. Finally, quantitative and statistical examination of the results may be hindered by the study's emphasis on qualitative data analysis.

Data Analysis

4.1 Patients' Part

Population Characteristics

In analyzing the trial data, demographics of the 14 patients choosing telemedicine follow-up care for chronic diseases were taken into consideration. Age groups ranged from 32 to 79. The five males and nine females showed a slightly greater female representation among total patients. Understanding patients' attitudes toward telemedicine requires accepting gender differences. A demographic background First, the subsequent sections examine patients 'initial reactions and experiences as well as benefits and challenges of telemedicine, their strategies for dealing with it from an ethical perspective regarding self-health management planning caused by chronic disease follow-up (Usak et al., 2020). The purpose of this analysis, in conjunction with demographic data is to explore whether there are any potential trends or correlations between telemedicine and chronic disease management.

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Initial Perception of Telemedicine

The second section does an analysis of patients 'preliminary impressions about telemedicine. Mobility-impaired patients and those living in remote areas welcomed the convenience. The time savings were crucially important, very helpful to all who had job constraints or elderly patients. After initial doubts, patients came to like telemedicine for ongoing treatment. Proper communication and a broad education are important prerequisites for smooth progress (Kelly et al., 2020). Positive responses show that acceptance of telemedicine is largely a matter of convenience, efficiency and accessibility. To successfully implement telehealth, healthcare providers must assure patient understanding (Qadri et al., 2020).

Benefits of Telemedicine

Various benefits of using telemedicine to follow up on chronic illness were reported by patients. Ease of use and wide availability were the salient aspects, less costly than visits to clinics or hospitals. Not only did it make healthcare more accessible, especially for elderly people with physical disabilities; they do not have to go out halfway here (Shakya 2020). Benefiting people with busy schedules, patients no longer had to wait in queues and spent less time traveling to appointments. Cost savings, including lesser transportation costs and parking expenses combined with overall financial aid, were particularly noted as benefits for chronic disease patients who have to visit the hospital regularly (Gupta et al., 20 A second advantage was that there would be less interaction with other patients, which increased safety by reducing the possibility of contracting communicable

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illnesses. These were the positive aspects which patients emphasized, going over their expectations and increasing satisfaction from telemedicine in chronic disease management.

Evaluation of Communication during Telemedicine Visits

This study into patient views of doctor-patient encounters in telemedicine appointments examines doctors 'levels of communication and responsiveness as well as their success with treatment programs (Tan et al., 202) Patients were especially pleased with telemedicine sessions, noting that physicians gave clear instructions and explained at length. Doctors 'in-depth response to patients' questions and concerns contributed greatly to patient satisfaction overall. Quick responses also increased patient trust and put concerns to rest, stirring confidence in telemedicine treatment (Wan et al., 2020). Patients' praise of individualized treatment plans based on their own unique conditions increases confidence that the plan will work out. But effective communication during telemedicine consultations can also boost patients 'faith in the quality of treatment. The study highlights the importance of doctors in telemedicine, that clear and thorough communication is imperative so patients can bestow their trust in chronic disease management.

Challenges and Concerns with Telemedicine

Looking at the problems patients have with telemedicine for chronic condition follow-up, we can find some repetitive issues. And even if most patients had no serious complaints, problems with outdated phone numbers led to

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miscommunications and calls meant for loved ones coming up on the wrong line. Updating files resolved this problem. Blood sugar and blood pressure monitoring is time consuming for some patients (Pierce et al., 2021). However, as patients became better informed about telemedicine's advantages it gradually allayed initial reservations. Internet connectivity became a principal obstacle, hampering communication and quality of experience. A widespread use of telemedicine requires reliable internet connections (Ullah et al., 2019). Solving contact information problems, giving clear directions on how to monitor at home and providing education that eliminates anxiety are all important in improving patient experiences. The most basic of these is having constant internet access so the physician can reach him as soon as there's a problem. These obstacles demonstrate the continuing importance of testing, reviewing and revising telemedicine systems to make patient service with chronic diseases as convenient as possible.

4.2 Physicians' Part

Initial Thoughts and Concerns about Telemedicine

Exploring the initial response of medical professionals to telemedicine shows that such a term as concerns, but also hopes for its benefits. Some doctors were initially slow to see the benefits of telemedicine, saying that virtual appointments lacked a complete physical examination. But, perceiving its many advantages doctors themselves considered that telemedicine could quite serve as a replacement for personal visits to the clinic only for lab testing. Accordingly, telemedicine was also seen as having value when family members couldn't go with patients. It offered a

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way to keep them involved in the treatment (Chike-Harris et al., 2021). Visions of the future included faster analysis of test results, better patient accessibility, shorter waiting times and reduced number being dropped off insurance plans. Because telemedicine was convenient, these chronic patients could receive more frequent follow-up visits. Doctors would then be able to monitor their progress and adjust the treatment plan if necessary. There was at first some skepticism, but doctors recognized that telemedicine could improve post-discharge patient care. Calming any fears, for instance about the limitations of physical examinations, requires patient selection and explaining just how a diagnosis is made. For patient-centered care with all costs optimized and concern minimized, telemedicine has to be incorporated successfully into primary healthcare centers (Jimenez et al., 2020).

Benefits of Telemedicine from Physicians' Perspective

Telemedicine provides doctors with several advantages, serving to increase patient satisfaction and help smooth the process of treatment delivery. It allows for convenient medical care without physical visits, making the patient experience better overall (Haleem et al., 2021). Of special value to sufferers who have their diseases under control are telemedicine's efficiency in follow-up care. Also, many patients don't need face-to-face visits that frequently; with the ability to represent oneself and manage one's own health easily, they no longer rely on others for advice. The more frequent use of telemedicine is also expected to reduce the incidence of missed appointments, accelerating early follow-up care and minimizing interruptions in treatment. Ultimately this means better healthcare

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outcomes for patients (Li, 2019). In addition, medical experts point to time saved by immediate access on test results and direct communication with patients, which means that treatment regimens can be altered more quickly. Second, telemedicine means that there will be less patient turnout in waiting rooms. This leads to a safer and more efficient healthcare environment with lower infection risks. Doctors also point to the benefits in terms of compliance and regular follow-up.

Healthcare Services Provided via Telemedicine

For self-management of long-term illnesses, telemedicine provides a variety of services. The scope is restricted to the management of stable chronic patients only (i.e., well controlled). Virtual consultations allow doctors to follow carefully regulated chronic disorders, and improve continuously before changing treatment plans (Ratta et al., 2021). Thanks to telemedicine, lab investigations and medication adjustments are tracked remotely. Thus necessary changes in treatment regimens or drug dosages may be made promptly once problems arise. This monitoring helps keep patients in the picture. The transmission of SMBG and BP values to doctors in real time allows them not only to monitor patient data but also provide information on treatment, helping patients take more control over their lives. In addition, telemedicine lets doctors send patients to specialists according to medical test results. This increases effective coordination of care and more integrated treatment of chronic diseases (Majeed & Khan 2019). Telemedicine is also flexible, so cancellations can quickly be rescheduled. The point is that patients receive the necessary treatment and follow-up in either an online or face-to-face

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setting. Finally, telemedicine could make for more streamlined and coordinated healthcare by giving patients varied care options including delayed appointments. However, it would need to include designated receptionists or assistants who can refer them directly to the specialist they should visit further along in their treatment process instead of having multiple specialty liaison branches handling this work. Other applications involve remote monitoring through devices such as

Challenges of Conducting Telemedicine

For telemedicine for chronic disease follow-up, there are many obstacles. They include structural/system startups and concerns related to patients for care quality; technical shortcomings and process-related difficulties; medicolegal factors such as privacy protection or ownership of retirees 'mailboxes that cause concern in seniors' minds about sharing their medical records with a third party over the Internet Poor infrastructure and lack of private consulting spaces may affect patient privacy and quality of care. Late response, inadequate preparation and preference for face-to-face contact thus hinder the effectiveness of telemedicine. These worries might be alleviated by remote monitoring and patient self-reporting. The effectiveness of telemedicine also depends on technical issues, including unreliable communication lines (Ahad et al., 2019). Process matters, such as protracted consultations and unrecorded prescriptions, are manageable with clearly formulated protocols and better communication. From medical law perspective, there are privacy and security concerns, such as patient identity authentication and confidentiality in remote environments (Galle et al., 2021).

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Key Factors for Telemedicine Success

Technology, organization and so on are all important factors in telemedicine's success in chronic disease follow-up treatment. Successful telemedicine means having stable internet access and sound information security measures to protect patient privacy (Kumar & Smys, 2020). Achieving clinical and administrative proficiency, in turn supported by IT infrastructure and training resources, adds to the overall productivity of telemedicine services. Social and cultural considerations help patient acceptance and participation factors such as being taught how telemedicine can be of benefit to them. Therefore, the particular cultural norms for female patients to receive treatment from male physicians is an important factor in telemedicine's success (Kraus et al., 2021). Effectiveness in telemedicine is also impacted by organizational variables such as the extent to which healthcare practitioners are space equipped and patient records stored.

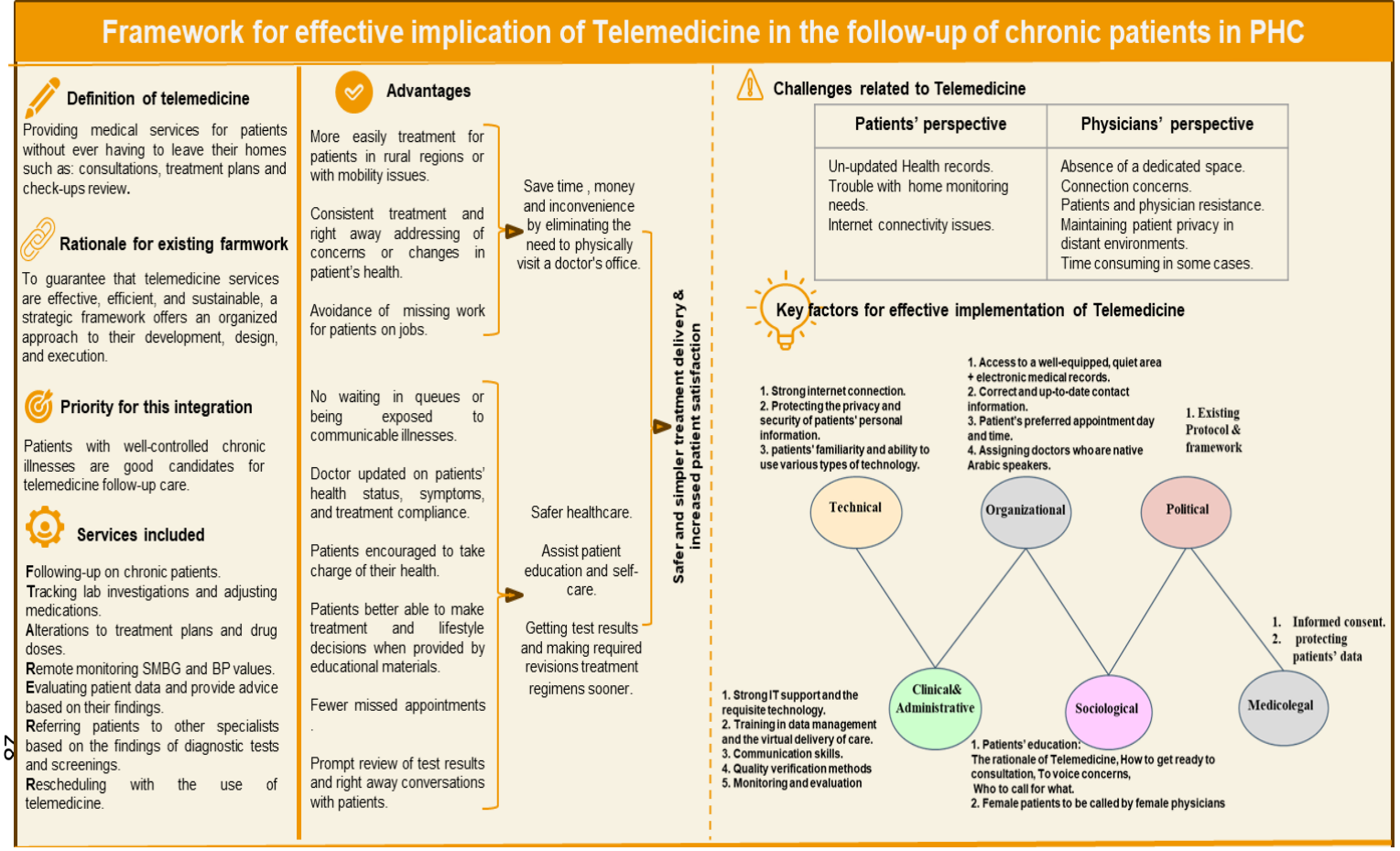

Figure 1: Developed framework based on study finding: Definition of Telemedicine, Rationale for existing framework, Priority for Telemedicine integration in Primary Healthcare, Services included in Telemedicine serviced for chronic cases, Advantages of Telemedicine, Challenges related to Telemedicine, Key factors for effective implementation of Telemedicine in Primary Healthcare.

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Conclusion

5.1 Summary of Findings

This section summarizes the results of a study that compared doctors' and patients' impressions of telemedicine for chronic disease follow-up. The purpose of this section is to summarize the most important facts and discoveries that came out of the data analysis. The results showed that patients had an optimistic first impression of telemedicine for follow-up treatment. People of all ages, but notably those with busy schedules or who are infirm, have expressed enthusiasm for the potential of telemedicine. They liked not having to go anywhere to get medical treatment, and they especially liked not having to ask their employers for time off. Incorrect contact information, the need for home monitoring, initial worry, and shaky internet connections were just a few of the early obstacles that some patients experienced. However, these obstacles were overcome by modernizing health records, educating patients, and enhancing the organization's technological infrastructure (Iyengar et al., 2020). Doctors were found to be skeptical about telemedicine at first, but they eventually came to see its value. In the case of stable chronic diseases, doctors emphasized the convenience and time savings benefits to patients. Telemedicine was seen as an expedient approach to analyze test findings, increase healthcare access, and decrease missed appointments. In order for telemedicine to be effective, doctors say it needs things like better technology, more administrative backing, wider social and cultural acceptability, more prepared organizations, and clearer political rules. Physician education and well-defined

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policies for implementing telemedicine were also highlighted. Insight into the possible advantages and disadvantages of telemedicine for the follow-up care of chronic illnesses is provided by the study's implications. In especially for chronic patients who are stable, the results imply that telemedicine may raise patient satisfaction, make therapy more accessible, and boost compliance (Usak et al., 2020).

5.2 Implications of the Study

The study's consequences for healthcare practice are substantial. First, telemedicine's potential usefulness in providing follow-up treatment for chronic illnesses is supported by excellent patient reception and satisfaction. Particularly for chronically stable patients, healthcare practitioners should think about using telemedicine into their service delivery strategy. This will allow the healthcare system to better allocate its resources, increase patient participation, and broaden patients' access to needed services. To guarantee a smooth rollout of telemedicine, the report also highlights the need of healthcare institutions investing in technology infrastructure and support services. This entails having reliable access to the internet, using secure data transfer platforms, and having access to IT help in the event of technical difficulties (Kelly et al., 2020). To maximize the advantages of telemedicine and resolve any concerns or opposition to its usage, proper training and education for both patients and healthcare practitioners are needed. The results also stress the need of open and honest communication during telemedicine consultations and the value of putting the patient first. In order to ensure that their

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patients comprehend the treatment plan, doctors need be taught how to communicate effectively with them. Better communication and overall satisfaction with telemedicine might result from doctors being well prepared and oriented to the case before the telemedicine session (Qadri et al., 2020). The research also supports the idea that well-defined rules and regulations are required to control the introduction of telemedicine. Case selection, training needs, telemedicine service evaluation, patient satisfaction surveys, and data privacy and security are all areas that need to be included in these rules and regulations. Consistent and high-quality telemedicine services may be maintained across healthcare facilities if common norms and frameworks are established.

5.3 Recommendations for Practice

To further develop telemedicine in chronic disease follow-up, providers ought to incorporate it into standard care with emphasis on stable patients needing frequent monitoring. How can telemedicine be implemented successfully? It's important for patient education on the value of telemedicine, preparing them to visit virtually and dealing with technological problems. Engaged patients contribute to better outcomes and satisfaction. Advanced technical investments, such as internet connectivity, data security and technology support are essential for the smooth running of telemedicine (Gupta et al., 2020). It is important that training in telemedicine procedures and communications skills for performing virtual consultations, as well as privacy protection, continue to be provided to healthcare practitioners. Practitioners 'knowledge and comfort in offering telemedicine

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services should be supplemented by continuous support, information tools. Quality assurance mechanisms for the monitoring and evaluation of telemedicine services help to make them effective and efficient (Shakya, 2020).

5.4 Recommendations for Future Research

The initial study results are encouraging, but more research is warranted to explore different areas of telemedicine in chronic disease follow-up. To evaluate telemedicine's impact on disease control, patient adherence and quality of life will require long-term evaluations. This shall help validate telemedicine's ability to improve patient outcomes and lead to evidence-based recommendations. Exploring cost-effectiveness analysis is another area to be considered, helping healthcare policymakers gauge the difference between remote treatment and traditional care. There is a need to consider different points of view from within the larger patient-provider community in preparing target campaigns for telemedicine (Wan et al., 2020). Target chronic diseases such as diabetes, hypertension and cardiovascular diseases also deserve special attention in their own right. Studies are needed on the effectiveness and impact in enhancing patient satisfaction of different types of telemedicine, such as video consultations and phone conversations (Tan et al., 2022).

5.5 Limitations of the Study

It is important to note that there are certain caveats to this study's findings, despite the fact that they shed light on the potential of telemedicine for the follow-up treatment of chronic illnesses. First, the research included a limited sample size of

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patients and doctors, which might restrict how widely applicable the results are. The study's external validity would be improved and new insights gained from a bigger and more varied sample. Second, the research only included participants from one hospital, thus the results may not apply to patients and doctors at other healthcare facilities. The availability of resources, the structure of existing healthcare systems, and the local culture all have the potential to affect how well telemedicine works (Pierce et al., 2021). In order to have a more complete picture of how telemedicine might be used in the follow-up treatment of chronic illnesses, future research should involve numerous healthcare facilities and varied demographics. Patients' and doctors' dependence on self-reported data raises the possibility of response bias. The results may be less accurate and reliable due to the subjective nature of replies and possible recollection bias. Self-reported data may be supplemented with objective assessments or mixed-method techniques in future research. In addition, the research may have underrepresented other telemedicine modalities since it largely focused on telephone-based telemedicine. A more complete picture of the pros and downsides of various telemedicine systems might be gained by include additional modalities like video consultations or remote monitoring.

5.6 Conclusion

In conclusion, this research analyzed how patients and doctors feel about using telemedicine for long-term care follow-up. The results show that people have a favourable first impression of telemedicine due to its many advantages, which

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include greater accessibility, ease, and efficiency. Patients valued not having to leave their homes to obtain treatment, which cut down on both travel time and stress. Physicians saw that telemedicine may improve patient outcomes, including as satisfaction, default rates, and resource use. Challenges and worries were also noted in the research, such as erroneous contact information, the need for home surveillance, early nervousness, and inconsistent internet connections. Successful introduction of telemedicine requires addressing these difficulties via patient education, enhanced infrastructure, and continued assistance (Ullah et al., 2019). The study's findings emphasize the need to include telemedicine into care models, involve patients in their own care via education, provide a solid technology foundation, educate healthcare professionals adequately, and put in place quality assurance measures. These suggestions may help medical professionals and institutions improve their use of telemedicine for monitoring patients with chronic diseases. Although this research adds important new information, it does have certain restrictions. Further study is needed because of the study's limitations, including its small sample size, narrow emphasis on one healthcare facility, heavy dependence on self-reported data, and restricted range of telemedicine modalities. Long-term patient outcomes, cost-effectiveness, viewpoints of varied stakeholders, and the influence of different telemedicine modalities should all be investigated in future research that try to solve these shortcomings.

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