OPEN ACCESS
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Publications 2024
ONLINE ISSN: 2992-5460
PRINT ISSN: 2992-6041

NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN MEDICAL SCIENCES (NIJRMS)

Volume 5 Issue 3 2024

https://doi.org/10.59298/NIJRMS/2024/5.3.20230

The use of Telehealth in Managing Diabetes

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ABSTRACT

The rising prevalence of diabetes, particularly type 2, has put enormous strain on worldwide healthcare systems. Telehealth is becoming an increasingly important aspect of modern healthcare, and it offers a viable approach to improve diabetes management by improving patient outcomes, access to care, and medication compliance. This study investigates the use of telehealth technologies in diabetes management, focussing on their benefits, problems, and future potential. Telehealth can help to overcome geographical boundaries, provide regular monitoring, and deliver personalised care. However, it has limits, such as discrepancies in technology access and data security. Understanding these aspects is critical to optimising telehealth's role in diabetes care.

Keywords: Telehealth, Diabetes Management, Type 2 Diabetes, Remote Patient Monitoring, Healthcare Access.

INTRODUCTION

Today's diverse health landscape presents various challenges, including increasingly complex chronic conditions, a fast-growing number of older adults, and continued financial strains. Naturally, these demands have sparked a renewed focus on effective healthcare delivery, as evidenced by the Global Strategy on People-Centred and Integrated Health Services. It should not come as a surprise, then, that telehealth has been a topic of increasing interest among researchers, policymakers, and practitioners in recent years. Among the conditions primed to see significant benefits from telehealth intervention is diabetes particularly type 2 diabetes. Diabetes prevalence increased from 6.4% to 8.5% in adults, with significant morbidity and mortality in people older than 50 years. Since the condition has reached near-epidemic status around the world, innovative solutions and integrated approaches for better diabetic care should be addressed [1]. Some of the most important benefits that telehealth applications can offer are quality-of-life improvement and patient outcome enhancement; these are the primary biological and personal objectives of diabetes management. Telehealth-based interventions are designed to make these outcomes more accessible without the presence of an endocrinologist or diabetes educator, and access to healthcare resources in rural areas often needs telehealth applications. It has been shown that the use of telecommunication technology as part of healthcare will expand interventions within context care outcomes. Therefore, this review will outline available telehealth applications in the management of diabetes in the U.S., from technology types to their use in diabetes care. In addition, it will discuss telehealth in diabetes care and possible strategies for its development in the future [2].

UNDERSTANDING DIABETES AND ITS MANAGEMENT

A person living with diabetes is affected in several ways and across all areas of their life, including physical, emotional, and social. People often think of diabetes as Type 1 diabetes, which generally has a sudden onset affecting mostly young people and children, or Type 2, which tends to present progressively after the age of thirty and is largely lifestyle-based. There is also gestational diabetes, which is diagnosed during pregnancy. All types of diabetes are due to the pancreas not functioning correctly. This means insulin is either not produced at all, or in insufficient amounts, or the body is not able to utilize it properly [3]. The management of diabetes is challenging. If there is too much sugar, the condition is hyperglycemia, and if there is too little sugar, it is hypoglycemia; both can lead to complications. It is important to have physical activity, healthy eating, and regular blood glucose monitoring as part of day-

ONLINE ISSN: 2992-5460
PRINT ISSN: 2992-6041

to-day life, although some people will also require medication to maintain their blood glucose levels. Strong evidence from around the world shows that people who engage in lifestyle management of their diabetes can achieve good outcomes. Management of diabetes is undertaken through a team to help support a person to be able to manage their diabetes and their life as best as they can [4].

TELEHEALTH: DEFINITION AND EVOLUTION

Understanding telehealth requires a definition of what is at the heart of the technology. Telehealth describes the use of a variety of systems from one-on-one videoconferencing to virtual visits, remote consultations, virtual group meetings, mental health counseling, rehabilitation virtual sessions, telephone sessions, and single or multiple health provider communication to provide advice or support. Unlike some interventions like food access, transport, and housing which take on specific causes for health disparities and poor health outcomes telehealth is a function of health care delivery on par with everyday medical consultations and health management. Accessing health care is a foundational element of support for all programs and practices. Accessibility to in-person care is likely the most pressing challenge for many disadvantaged and remote communities, and so telehealth operates as an evolution over an age-old model of serving hard-to-reach populations from farther away [5]. Telehealth has become a familiar term in recent years, but the ability for patients to access care over a PC or via a mobile app has taken some time to develop. Telehealth was once mostly defined by the physical setting for patients to access remote care clinics or centers a model that extends back to the 1950s. As chronic care practices have evolved, dramatic changes in technology have emerged first analog, and digital, then transferring to the internet, then smartphone platforms, and have pushed an evolution in telehealth approaches to remote patient monitoring and mobile health applications. Remote patient monitoring, or telemonitoring, led the way in developing a health technology space in slimmer watches and digital monitoring in services, but today's wearable health tech is a mix of both ECG/EKG analysis, blood oxygen level monitoring, immunosignal testing, and a long list of tools and data services designed to give users deeper insights into personal health. Technology advancements have been matched by major regulatory changes easing remote health services. By building a relationship between a patient and telehealth online consults and physical services, professionals have been removed significantly from their patient or client markets. However, the health innovation of consumers purchasing low-cost connected health tools to test vitals has expanded patient-client behavior. This convergence of consumer-oriented tech-enabled health data with clinician-interpreted data did not address the long-running challenge for patient use of telehealth, however. Acceptance into daily care routines has been an ongoing process for practitioners, and some norms and preferences have kept specific subgroups from taking advantage of the services. Telehealth acceptance begins with the first impressions. For engaged patients who like to follow health news, the benefit of changing workflows with group or single interactions is dominant. Some areas of acceptance include active military duty members and employees during times of travel or those who have workplace-sponsored telehealth programs for remote access to medical care. We must understand the history of telehealth and how we came to be to assess the value of telehealth today [6].

BENEFITS OF TELEHEALTH IN MANAGING DIABETES

One of the most crucial aspects of diabetes management is regular monitoring of various health parameters. While some patients may find in-person appointments challenging or inconvenient, the use of telehealth could supplant this need, making diabetes management more accessible to all. The use of telehealth in diabetes management would eliminate geographic barriers. Through telehealth, patients could access care from diabetes specialists, such as endocrinologists, regardless of where they live. Patients with physical disabilities or health problems may not be able to travel to see specialists, but with telehealth, those with health problems could still receive appropriate care. Convenient care through the internet could improve patient adherence, as patients may be more likely to access telehealth services, as opposed to in-person care. Telehealth could be a relatively efficient means of delivering quality care, as travel time and expenses would be removed for both patients and healthcare providers. Patient care could improve from more efficient patient monitoring capabilities for healthcare teams. Personally designed mobile phone alerts could prompt lifestyle management activities tailored to the individual patient profile. Through telehealth, a clinical team could have improved channels of communication with patients [7]. Telehealth can facilitate team-based diabetes management. Mobile phone-based glucose records and assisted disease-acuity analytics can support real-time proactive care decisions. Telehealth analytics can create patient profiles based on their clinical data. These profiles could indicate disease complexity or acuity, serving as a predictor for future diabetes-related complications. As service providers learn more about diabetes, technology-enabled care evolution would use data analytics to expand its categories of care and personalize them to meet the needs of the populations served. Policy barriers previously inhibiting telehealth are being reduced. Overall, telehealth's biggest promise is its potential to transform

ONLINE ISSN: 2992-5460
PRINT ISSN: 2992-6041

the current burdensome lifestyle of diabetes management into personalized, efficient, and effective care. With the excitement over this relatively new tool and its initial potential, it is likely that much more capacity and promise exists in telehealth to monitor and manage diabetes [8].

CHALLENGES AND LIMITATIONS OF TELEHEALTH IN MANAGING DIABETES

Telehealth can be a useful tool to help manage diabetes and perform tasks such as monitoring blood glucose levels, contacting doctors when needed, and providing dietary and exercise recommendations. However, there are limitations and challenges to telehealth for diabetes. For example, these types of programs may not be suitable for those who are at high risk of developing diabetes or those who are the least self-sufficient. The digital divide is another challenge. More than 30% of those who must manage diabetes may not have internet access. Internet access rates for people with diabetes are lower among the elderly, minorities, and those in certain geographic areas. Some people may not want to use telehealth because they are too old, have never used the internet, or are afraid to use technology. As a result, their digital literacy may be limited. Health information technologies are still developing, making it difficult for a wide range of people to access and use them. There are also concerns that data collected through telehealth would not be secure. Other issues include human interaction between clinicians and people with diabetes. People worry that telehealth will result in less personal care for them. Another concern about telehealth technology, even though diabetes management is not well controlled, is the issues associated with the platform. These are mainly related to operational as well as regulatory and reimbursement challenges. For many people, telehealth services are difficult to access, which limits their diabetes management capabilities. It's a tool that doesn't yet meet the needs of some people with diabetes who want to use it. This shows that future telehealth services may need to target segments of the population that are not currently interested in interventional studies. The uptake of diabetes telehealth and the benefits of these programs will be maximized. There is a need for further development, connectivity, education, and research [9].

CONCLUSION

Telehealth has the potential to revolutionize diabetes care by providing improved access to healthcare, especially for remote or underserved populations. Its benefits include real-time monitoring, personalized care, and convenience, which could enhance patient adherence and outcomes. However, the effectiveness of telehealth in diabetes management depends on addressing current challenges, including digital literacy, data security, and technological infrastructure. For telehealth to reach its full potential, efforts must focus on overcoming these barriers and ensuring equitable access to digital health solutions. The future of diabetes care lies in the continuous development of telehealth technologies, better integration with existing healthcare systems, and the promotion of its use across diverse patient populations.

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CITE AS: Wambui Kibibi J. (2024). The use of Telehealth in Managing Diabetes. NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN MEDICAL SCIENCES 5(3):20-23
https://doi.org/10.59298/NIJRMS/2024/5.3.20230