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OVERVIEW OF TELEMEDICINE ROLES IN IMPROVING DIABETIC PATIENTS CARE IN FAMILY MEDICINE

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Abstract:

Diabetes affect a chronic disease which affect very big population and has very dangerous consequences. This makes patient often visit physician for monitoring and checking, however telemedicine can improve life and easily report the current health status. In this review we discuss where telemedicine used, in which field it can be used and also its efficiency. We conducted a comprehensive electronic database of biological and health sciences including MEDLINE (PubMed), Scopus, EMBASE, Embase, Ovid, Google Scholar, and Scientific Information Database (SID). The main keywords used in search for studies included in this review included: "Diabetes", "primary care", "telemedicine", "family medicine", and "management". Diabetes Mellitus is just one of the persistent diseases which can impact mostly all age groups worldwide. Telemedicine approaches integrated with the usual treatment are associated with improved glycemic control in diabetic person individuals. Individuals surveyed reported seeing a physician and also going to the emergency room much less commonly. Patients also reported investing much less on traveling as well as handling their chronic problems more effectively with the help of telehealth.

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INTRODUCTION:

Diabetes belongs to one of the most prevalent chronic diseases around the world and is associated with premature death and also impairment. Over the past 3 decades, the prevalence of diabetes mellitus has more than twice increased globally and also is forecasted to increase additionally from 382 million in 2013 to 592 million in 2035 [1]. The disorder is associated with a number of health-related problems, high morbidity and death rates and thus imposes substantial social as well as economic concerns around the world [2]. Optimal glycemic control helps to stop as well as minimize difficulties of diabetic issues, including cardiovascular disease, kidney ailment, blindness, neuropathy and limb amputation [2] Nonetheless, preserving ideal glycemic control is difficult [2].

Challenges in the treatment of diabetic people require ingenious management techniques to improve glycemic as well as pressure control, as these are often above the desired objectives [3]. The optimum administration requires an organized, methodical as well as worked with approach [3]. Solid evidence demonstrates helpful impacts of patient monitoring and education and learning, focused on a noticeable duty of the specific self-care with the support of health care professionals [4]. This brings into focus the terrific breakthroughs in telecommunication modern technology as well as InfoTech, which can be made use of to improve diabetes mellitus administration [4]. Telemedicine can be a method for closer monitoring as well as intervention to attain not only far better metabolic control, but likewise to help in the global treatment of individuals with several chronic diseases [3]. Telemedicine has formerly been shown to have scientific benefits for people with severe bronchial asthma, persistent obstructive pulmonary disease, hypertension or persistent heart failure [5]. It may likewise be handy for providing care to people with diabetes mellitus, especially those incapable to take a trip to healthcare facilities owing to huge distances or specials needs. Particularly, telemedicine may assist in self-management, a crucial possible goal in diabetes treatment [6].

Over the last years, numerous researches have attended to the usefulness as well as efficacy of telemedicine methods on the administration of diabetes patients [7]. Several studies have verified it to be possible, but the genuine impact of this of intervention in general and also certain medical circumstances is still unknown as well as inadequately documented, as the results are not constant among different researches [7], [8]. If proven valuable, the intervention could be widely disseminated to clinical technique and also might aid to reduce the burden of the disease.

Diabetes affect a chronic disease which affect very big population and has very dangerous consequences. This makes patient often visit physician for monitoring and checking, however telemedicine can improve life and easily report the current health status. In this review we discuss where telemedicine used, in which field it can be used and also its efficiency.

METHODOLOGY:

We conducted a comprehensive electronic databases of biological and health sciences including MEDLINE (PubMed), Scopus, EMBASE, Embase, Ovid, Google Scholar, and Scientific Information Database (SID). The main keywords used in search for studies included in this review included: “Diabetes”, “primary care”, “telemedicine”, “family medicine”, and “management”. Search was restricted to English language published until December, 2018.

DISCUSSION:

Telemedicine

Telemedicine is a broad term consisting of a number of innovations, from digital X-rays to over-the-phone consultations, application of video conferencing and performance of remote surgical treatment [9]. In other words, it is just using telecommunications technology for the delivery of healthcare or services. It provides accessibility to treatment via video calls, e-mails, access to clinical info, and remote medical diagnosis including look after rural people in the near future. Breakthroughs in the field are to allow the substantial number of the earth to be within reach of medical care. This would certainly alter substantially the course of advancement of many countries. Telemedicine supplies flexibility by making it easier for people as well as individuals to access medical care. Rather than investing numerous hours or days traveling to a healthcare center, clinical advice as well as consultation could be obtained extra locally, liberating time and also enhancing the ease of obtaining treatment [10].

Nonetheless, this emerging innovation, as when it comes to arising technologies, has considerable obstacles to get over before it can realize the potential it offers. Understanding the area as it grows poses one major challenge. If the advancement of modern technologies consisting of e-mail and also cellular phone is thought about, it appears that accurate info as well as understanding of the technologies in the establishing country context in terms of the possibilities that it offers is lacking. For instance, global firms have a failure rate of 71% in adjusting Western information and communication technologies (ICTs) to creating nations [11]. This suggests a lack of sufficient info or research for the

application of emerging modern technologies in developing countries.

Telemedicine in developed countries

Telemedicine enhances the quality of health care distribution in the industrialized countries. Established countries such as USA, UK, Sweden, Australia, New Zealand, France, Switzerland etc., have actually taken on telemedicine in the healthcare settings to lessen the cost of the healthcare [12]. They established advance networks of digital health and telemedicine in their rural areas so that the people could quickly access healthcare, which lessen the cost of traveling to large cities. Telemedicine is being made use of a lot more successfully in US, UK, Australia and New Zeeland [13-15].

It's more tough to provide healthcare all over the globe in 21st century. Bulk of the electronic health and wellness and also telemedicine services given in the established countries are based on the diagnosis and also medical administration of the chronic diseases, specifically in UK, Scandinavia, Australia and North America [16]. Determining and keeping track of gadgets for heart rate, blood pressure and also level of glucose in the body are likewise made use of to remotely manage the individuals at remote places at homes [17], specifically in those areas where individuals cannot conveniently gain access to healthcare services. Nonetheless particular issues are being encountered by the established counties in supply of healthcare via telemedicine and also its execution. Significant concerns include breach in patient privacy and confidentiality, competition in different top priorities of health system and also viewed absence of need [18].

Use of mobile phone in health care provision

Enormous use of media as well as other digital devices in the field of health care has actually shown success in encouraging patients to boost their wellness habits. Instances of such technologies include television, computers, Internet as well as cellphones [19]. A study performed at St. Gabriel's Health center in Malawi, where community health workers were provided with smart phone and also were completely trained concerning its use in the far flung rural areas for different functions consisting of person compliance reporting, medical professional queries, and also visit reminders. It was located that overall 2,048 hours of functioning time was conserved, fuel saving was $2,750 and also the capability of tuberculosis treatment program was doubled, as much as 200 people [20]. Another research study carried out in USA reported that use smart phone is an inexpensive strategy to advertise healthcare provision and also its utilization in healthcare system in therapy of numerous illness like diabetes mellitus, asthma, hypertension and chlamydia trachomatis infection [21]. A study was carried out on cellphones with video camera to see its use for medical microscopy and also applicability for international health. The author reported a favorable result after making an instrument has camera-enable mobile as well as microscopic lense eye piece, which can aid in the very early diagnosis of various infectious ailments in those setups where technological equipment's are not available [22].

Smart phone was likewise made use of to see the adherence of the people with antiretroviral treatment. A randomized control trial conducted in Kenya in 2010 in three various centers on 538 participants, reported that those who were being advised via mobile text messages showed a better adherence to the therapy [23]. Likewise, an additional trial carried out in Korea on 51 participants to see the performance of cellphone and SMS in glucose control and behavioral modifications in diabetic individual located a significant decrease in the HbA1c [24].

Use of mobile phone in the management of diabetes

Research study performed on using mobile phones in the tertiary health care setups in developed countries, especially in diabetic person individuals, proved that it can improve the blood glucose levels by motivating the individuals to adhere to the therapy [medications] [25].

Smart phone as well as net are mechanical support devices for the patients with type 2 DM to develop their health by promoting excellent interaction in between the people as well as professional endocrinologist. Various supporting systems have actually been made to upgrade the monitoring of type 2 DM. A randomized test on mobile tele-monitoring in diabetic people was conducted in UK, reported that it is useful in the maintenance of high blood pressure as well as glucose [26]. It assists in accumulating data to develop the treatment activity on blood glucose degrees, HbA1c, behavior transformation, such as nutritional adjustment, exercise, medicine does and number of emergency check outs.

A testimonial research study was carried out in 2009 [includes released research studies between January 1990 and also March 2008 on behavioral modification interventions delivered by mobile telephone short message service, showing 33 such researches, out of which 14 met their incorporation standards. 4 out of 14 researches reviewed targeted precautionary health and wellness behaviors, Ex: smoking cessation (various other research studies also reported that use of mobile phone for smoking

cessation is very efficient), as well as 10 concentrated on clinical treatment (Ex: type 2 DM self-management). According to this review, favorable behavior adjustment outcomes were observed in 13 out of the 14 studies [27].

Various research studies have been done on mobile text message to manage incurable illness like diabetes mellitus, with the help of behavior modification [28]. Studies have actually verified that by encouraging individuals with reminders via text messages can develop conformity to dietary counseling and developed problems of the patients. A randomized control test conducted in Netherland on type 2 diabetic person individuals (207 topics) to see the improvements in the adherence to therapy by using Real Time Medicine Tracking as well as mobile text message, located it as a reliable approach [29]. Lately a research was performed in UNITED STATES to assess the feasibility as well as approval of mobile text message by the diabetic patients as well as reported positive reaction was discovered and it was recommended that its usage will prove to be beneficial [30]. Each other stud on relevance of SMS particularly in inadequate resource setting carried out in India as well as it was reported that this strategy can be used as an ingenious technique to fight persistent diseases like type 2 DM [31].

Telemedicine in Diabetic Retinopathy

DM is recognized by the World Health Organization as a genuine pandemic that impacts more than 10% of the population over 14 years of age, with type diabetes mellitus 2 (DM2) being the most usual presentation and also related to way of living habits such as sedentarism or obesity [32]. Taken into consideration a chronic disorder, its morbidity is brought about by the complications it creates throughout an individual's life time, these being generally stemmed from damage to huge vessels, or macroangiopathy (complicated by cerebrovascular accidents and heart attack), or damages to little vessels, or microangiopathy, leading to nephropathy, neuropathy or retinopathy.

Eye diseases brought on by microangiopathy or diabetic retinopathy (DR) are the main reason for blindness among young adults in the western world (aged in between 45 and 60) and are carefully related to poor metabolic control of the DM and aggravated by various other comorbidities that are present in DM, such as high blood pressure, dyslipidemia or nephropathy. Early medical diagnosis of DR is really vital since it has been revealed that strict control over glycemia and also high blood pressure reduces the progression of the retinopathy and, if it is absent, prolongs the time until its look [33]. Evaluating diabetics is for that reason basic for detecting the presence of DR as soon as possible. This ought to be executed by taking retinal pictures with non-mydriatic video cameras, an approved cost-effective method that makes it feasible to cover a great deal of people with DM [34].

Even with the fact that a system such as the one provided right here would certainly enable the testing of a lot of patients, with the advantage for the diabetic person populace this represents, the fact is that, to date, the screening of diabetic patients does not happen on a general basis and many individuals with DM do not undertake regular eye exams. So much to make sure that in established countries such as those in the European Union location, there are substantial deficiencies in compliance with eye assessments for diabetic people. With this in mind, the European "Screening for DR in Europe" group changed the 1990 St Vincent Declaration [35]. A big group of ophthalmologists and also endocrinologists from 29 European countries attended a number of meetings between 2005 and also 2011, which exposed a series of problems in applying screening suggestions. Such difficulties were determined as a paucity of information provided to the general public pertaining to testing visits, a shortage of groups and training programs, as well as inadequate partnership among family doctors, endocrinologists and ophthalmologists. In view of this information, it was decided to execute organized screening programs developed to reach at least 80% of diabetics by utilizing staff as well as professionals specially educated for this purpose.

When determining to apply a system of DR testing, we require to consider what kind of health care expert need to be accountable for managing patients with DM. In the majority of nations this is the family physician, with control by endocrinologists being restricted to individuals with really inadequate metabolic control of the DM.

The family physician was, therefore, the specialist that it was believed need to have the ability to ensure partnership with DR testing, although there was some reticence among some sectors, particularly ophthalmologists and optometrists. The not enough variety of ophthalmologists for such huge populations such as diabetics, combined with different researches on the performance of testing by family doctors, led the different working teams to choose that the family doctor needs to be involved in the DR testing programs given they are professionals in the evaluation of retinal photographs as well as have the assistance of an ophthalmologist that can oversee them, without this implying non-performance of complete eye assessments [36], [37]. In the United Kingdom, a country where screening has actually been even more commonly created, family doctors

are included in the programs and different specialists are involved in assessment (family doctors or optometrists) [38]. Furthermore, in the authors' healthcare areas, the general practitioner plays an essential role in DR screening [39]. It is for that reason important to impart the essential training to these specialists to ensure that they can find the existence of an incipient retinopathy as well as communicate with reference ophthalmologists so that the latter can after that give the needed assistance [39]. If more advanced kinds of retinopathy are found, they would certainly have the ability to refer the patient for therapy as quickly as possible.

Telemedicine is clearly of fantastic use to this system of DR screening making it feasible to send out pictures and information for an appropriate diagnosis, and troubling diabetic person people as little as possible.

In the authors' experience, consisting of general practitioners and guaranteeing they are suitably overseen by ophthalmologists that are professionals in DR, has allowed the testing of a lot of diabetics [40], [41]. Considering that 2007, from an estimated population of 17792 diabetics, it has actually been possible to screen 15396 individuals (86.53%), with 3.18 ± 1 visits during in 7 years. The scheme includes first of all training family doctors, that would then be accountable for evaluating the retinal photographs of diabetics in their area. In case of any type of suspicion of the visibility of indications suggesting DR, the reference ophthalmologist would certainly be consulted, and he/she then makes the final medical diagnosis and decides just how to manage the person. This procedure has actually caused the discovery of a yearly incidence of between 8.06% as well as 8.92% of people with DR, with the occurrence of individuals with diabetic macular edema being in between 2% and also 2.8% each year. It is additionally important to note that between 9.2% as well as 10.3% of various other pathologies have been found each year, consisting of macular degeneration connected with age, pathological myopia and the visibility of pigmented lesions such as nevi. Despite the initiatives we have actually made in our area, only between 32.40% and 41.16% of diabetic individuals go through screening for DR annually. Part of the problem is that screening is opportunistic rather than organized, and inadequate awareness amongst the population.

CONCLUSION:

The meaning of telemedicine is using telecommunications to support healthcare. Telemedicine includes prompt transmission and remote analysis of person data for follow up as well as preventative interventions. By the use of various forms of information technology like the internet, cellphone calls, text messages as well as television programs the provision of therapy can be made a lot more reliable. The crucial purpose of telemedicine is to strengthen the communication between people as well as the health care company which might bring about the improvement of individual's health as well as lessens the cost of the therapy. Mediums which are being utilized to distribute the health care are cellphones, digital diaries, notebook computer and medical choice support group. Diabetes Mellitus is just one of the persistent diseases which can impact mostly all age groups worldwide. Telemedicine approaches integrated with the usual treatment are associated with improved glycemic control in diabetic person individuals. Individuals surveyed reported seeing a physician and also going to the emergency room much less commonly. Patients also reported investing much less on traveling as well as handling their chronic problems more effectively with the help of telehealth.

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