English

Advances and difficulties of telemedicine as a tool for access to health services in Colombia

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Abstract

Introduction: *According to the World Health Organization (WHO, 2010), the improvement in the quality of life and health of human beings is due to projects such as e-health, cyber health and many others. In Colombia, telemedicine is defined as the provision of distance health services in the promotion, prevention, diagnosis, treatment and rehabilitation components, by health professionals who use information and communication technologies, which allow them to exchange data with the purpose of facilitating the access and the opportunity in the provision of services to the population that presents limitations of offer, of access to the services or of both in its geographic area.* **Objective**: *The objective of this article is to identify how the evolution of telemedicine has been in Colombia and what are the difficulties that are currently present for that topic.* **Results and discussion**: *In Colombia it has made important advances, fostered from the academic, technological and organizational levels, however there are still different barriers that must be minimized to make telemedicine a new way of providing health services.*

Keywords: *E-health; Telemedicine; Technology of the Information and Communication.*

Resumen

Avances y dificultades de la telemedicina como herramienta de acceso a los servicios de salud en Colombia.

Introducción: *Según la organización mundial de la Salud (OMS, 2010), la mejora en la calidad de vida y salud del ser humano se debe a proyectos como e-salud, ciber salud y muchos otros. En Colombia, la telemedicina se define como la provisión de servicios de salud a distancia en los componentes de promoción, prevención, diagnóstico, tratamiento y rehabilitación, por profesionales de la salud que utilizan tecnologías de la información y la comunicación, que les permiten intercambiar datos con el propósito de facilitar el acceso y la oportunidad en la prestación de servicios a la población que presenta limitaciones de oferta, de acceso a los servicios o de ambos en su área geográfica.* **Objetivo**: *El objetivo de artículo es identificar como ha sido la evolución de la telemedicina en Colombia y cuáles son las dificultades que se presentan actualmente para dicho tema.* **Resultados y discusión**: *En Colombia ha tenido avances importantes, fomentado desde lo académico, lo tecnológico y lo organizativo, sin embargo aún existen diferentes barreras que se debe de ir minimizando para hacer de la telemedicina una nueva forma de prestación de servicios de salud.*

Palabras-clave: e-salud; Telemedicina; Tecnologías de la Información y la Comunicación.

Resumo

Avanços e dificuldades da telemedicina como ferramenta de acesso aos serviços de saúde na Colômbia.

Introdução: *Segundo a Organização Mundial da Saúde (OMS, 2010), a melhoria da qualidade de vida e saúde dos seres humanos se deve a projetos como e-saúde, saúde virtual e muitos outros. Na Colômbia, telemedicina é definida como a prestação de serviços de saúde à distância nos componentes de promoção, prevenção, diagnóstico, tratamento e reabilitação, por profissionais de saúde que utilizam tecnologias da informação e comunicação, que lhes permitem trocar dados com o objetivo de facilitar o acesso e a oportunidade na prestação de serviços à população que apresente limitações de oferta, de acesso aos serviços ou de ambos em sua área geográfica.* **Objetivo**: *O objetivo deste artigo é identificar como está a evolução da telemedicina na Colômbia e quais são as dificuldades atualmente presentes para esse tópico.* **Resultados e discussão**: *A Colômbia fez importantes avanços, promovidos nos níveis acadêmico, tecnológico e organizacional, porém ainda existem diferentes barreiras que devem ser minimizadas para tornar a telemedicina uma nova maneira de fornecer serviços de saúde.*

Palavras-chave: *e-health; Telemedicina; Tecnologias de Informação e Comunicação.*

INTRODUCTION

Since the 1960s, telecommunications have made significant progress in all areas of society. This transformation has eliminated important factors such as space, time and existing physical barriers and for time were considered as important barriers in communication. With the passing of the years technological tools have had an accelerated growth, emphasizing the Internet and the communicational processes as the mobile phone, which have put at the hand of the societies different form of communication and interrelation.

Entering into context, health has not been a distant factor to the effects of telecommunications. As expressed by Haidegger, Sándor & Benyó[1], by the 1970s, technological progress allows terms such as telemedicine, developed as a form of remote consultation, to emerge.

Telemedicine has been defined by numerous international entities such as the World Health Organization (WHO), Pan American Health Organization (PAHO), European Economic Community (EEC) and others, establishing that telemedicine is established as a process of care in distant places, distance being a critical factor for health. This process is carried out by qualified personnel, who use ICT and telecommunications to establish diagnoses and care in order to improve the health of society[2].

Similarly, the advance of telecommunications in the health sector has a main objective of improving the quality of life of the human being. According to the World Health Organization[3], this improvement in the quality of life and human health has accommodated projects such as e-health, e-health and many others.

When evaluating telemedicine or telehealth in Colombia, telemedicine is defined through Law 1419 of 2010, which states that:

"The provision of remote health services in the promotion, prevention, diagnosis, treatment and rehabilitation components, by health professionals using information and communication technologies, which allow them to exchange data for the purpose of facilitating access and opportunity in the provision of services to the population with supply limitations, access to services or both in their geographical area"[4].

It is notorious to perceive that the standard refers to ICT as a way of establishing strategies in the health care of populations. In the country, telemedicine has had a place since 1986, when agreements were made with the private sector for this purpose. Another important fact of telemedicine in the country is carried out in 2002, with the project called "Apaporis-Leticia-Bogotá telemedicine pilot project", in which the National University of Colombia (UNAC) and the Technological Institute of Electronics and Telecommunications joined forces together with Colciencias, to provide consulting and teaching services in remote areas of the country.

For 2007, the Universidad Distrital Francisco José de Caldas, carries out the project Information System for Telemedicine Projects SITEM. According to Sánchez and Sánchez[5], the purpose of this project is "to support basic activities in the area of telemedicine, offering them a repository of data and tools that facilitate the tasks of capturing, extracting, organizing, analyzing, finding, synthesizing, distributing and sharing information and knowledge".

From another point of view, functions such as the Hispanic American Health Link (EHAS) have also emerged, an entity focused on the health care of the most remote communities in developed countries making use of ICTs.

As has been evidenced so far, telemedicine in Colombia has had projects that have sponsored the development of it. Similarly, it has a section of law that supports the use of telemedicine in order to reach distant elderly people and offer them a health service according to their needs.

However, the remote health service possible from telemedicine has been affected by the limited number of people destined to travel to rural areas and the little incentive on the part of the institutions that sponsor telemedicine:

What have been the advances and difficulties of telemedicine as a tool for access to health services in Colombia?

This bibliographic research article sets as objectives: To identify the advances or difficulties that telemedicine has presented as a tool for access to health services in Colombia.

Analyze the use of ICTs in telemedicine in Colombia as a means of reducing physical barriers to access to health services.

METHOD

The current methodology is based on a bibliographic research through the research of repositories such as Scielo, Redalyc, and Colombian Journals such as the Colombian Dental Act and others to achieve the objectives established in this research. It is necessary to emphasize that the articles of bibliographic review compile the most important and relevant information about a topic, which for the current case, is telemedicine as a tool of access to health services in Colombia. The expected results are aimed at identifying how telemedicine has evolved in Colombia and what the current difficulties are for this space. Similarly, an analysis of ICT and ICT tools in telemedicine will succeed in establishing such mechanisms for the current problem study which is aimed at the lack of incentive by institutions and personnel willing to serve the most vulnerable populations of Colombia, which has almost non-existent access to health services.

RESULTS AND DISCUSSION

Application of telemedicine in Colombia

Within Colombia, there are regions with a varied level of access to health, from the State and academia have been

proposed a series of initiatives that have accommodated studies related to the subject. One of these proposals has come from the Ministry of Health, which has developed a document called, Baseline of Telemedicine in Prioritized Municipalities of Colombia, one of the most important issues addressed in it, lies on the entities that should promote telemedicine and services offer.

Among the vulnerability criteria established to determine the most vulnerable populations in Colombia are: the current health situation, health management areas, border populations, consolidation and peace populations, among others. Social security in Colombia has been a system related to various criticisms of the effectiveness of its services, however, as established by Restrepo[6], Colombia has the third best health system and coverage in the world. Similarly, the country has difficult access zones, due to factors such as conflict, geographic system and other variables, where telemedicine can play a fundamental role in access to health for most of the country's population.

Regarding those who can provide a telemedicine service, Resolution 1448 of 2006[7] clearly establishes that only Health Service Providing Institutions (IPS) can carry out such work. Likewise, they must comply with certain regulations established by the norm in question; it is also necessary that the Health Service Provider Institutions are registered in the Special Registry of Health Service Providers as referral institutions or as referral centers.

Referral entities may be defined by the same standard as IPS(s) located in an area with limited access, while referral centers are institutions that provide health services with specialized assistance resources and information technologies sufficient and necessary to provide remote support in the promotion, prevention, diagnosis, treatment or rehabilitation of the disease required by one or more referral institutions in conditions of opportunity and security[7].

Analysis of the most important barriers to telemedicine in Colombia

Taking into account the research carried out by Correa[8], a quantitative study on the major barriers to the consolidation of telemedicine, it can be seen that among the main barriers to incorporating telemedicine in Colombian health institutions are those related to the lack of knowledge of telemedicine benefits, paradigm changes in EPS, unauthorized access to patient information and the loss, deformation or deterioration of medical records.
These can be seen in figure 1:

Figure 1. Barriers to telemedicine in Colombia.

Source: Correa, M[8].

In general, it is necessary in the medium term to strengthen the action of medicine from proposals, which must be established from the legislative, this mainly due to the permanent modification of the rules that regulate medical work with the help of ICT. Similarly, when new applications and new technologies arise, their use must be regulated, and the consequences of a

system failure must be foreseen. Technology is advancing at an accelerated pace, as is the case law and regulations that constantly regulate telemedicine and its actions.

From the point of view of ignorance, it is necessary to know the importance of telemedicine today, an important advance in health, through technological progress, which can be used in Colombia to ensure the enjoyment of health services contained in the constitution. As it has been expressed in other paragraphs, the geographic situation of Colombia hinders the access or the total coverage of the services of Health, fact that can be minimized through the use of the telemedicine.

Correa[8] states that these barriers can be overcome through a training program, mainly because the model of traditional or conventional change in the provision of medical health services cannot be peaceful without adequate knowledge of the norms and standards of distance medicine.

Decree 3039 of 2007[9] states that telemedicine barriers increase inequity in access to health, hence the perpetuation of the problem of differences in the well-being of men; to this end, the solution to be reached is to eliminate the causes that perpetuate them through plans, programs and constant training.

Likewise, Overby, Slaughter & Konsynski[10]; Alves[11], express through their researches that in the study of the laws and norms that govern telemedicine, timid or incomplete laws can be felt, due to laws that must be adjusted to the constant technological advance, since although there are laws that accredit the conditions of qualification of telemedicine and the accreditation in the academic formation of professionals in the handling of telemedicine technology, legally there persist gaps in resolutions and norms.

ICTs as a form of access for the entire Colombian population

A doctor and his patient contact each other personally, which is why the provision of medical services at a distance manifests itself as an innovative element. The foregoing makes room for what is known as virtual medicine, a figure that arises from the current need to provide the service and a lack of specialized medical equipment in the most remote areas of the country[12].

At present, a doctor has different tools that benefit non-presential care, understanding this as a distance, either from scenarios to provide a health service or a difficulty for patients to physically approach medical care centers.

The technological advances that a current hospital has, compared to those of a decade ago, represent an important step forward. As expressed by Monteagudo[12] "information and communication technologies are at the core of the health strategies of advanced countries and are one of the three main factors of change along with genomics and consumerism".

This allows the provision of medical services through telemedicine to go beyond existing spatial barriers and limits, making it a new way of looking at conventional medicine. From the explanatory point of view, conventional medicine frames a typical situation in which the patient must personally go to the doctor's office in order to be assessed. It is common in medicine to find a family doctor who has attended to your pathologies in different opportunities and therefore has access to the patient's medical history,

Likewise, conventional medicine requires the physical presence of the patient, so that in this way there is direct contact with the patient and a diagnosis can be generated about the pathologies or symptoms presented. From telemedicine, the treating physician and the specialist physician work together by means of a videoconference, video call or transfer of medical data, but always with the intention of cooperating to provide a health service with dignity.

What is expressed in the previous section is known as teleconsultation, defined by the World Health Organization and the Pan American Health Organization as: "the use of telemedicine resources to obtain a second opinion from a health professional through the exchange of clinical information".

Current uses of telemedicine

From a theoretical point of view, the totality of medical services can be provided through telemedicine. Nevertheless, Anvari[13]; Douglas[14], Espada, Muñoz and Magriña and others, express that the telehealth areas that have had more development are: teleradiology, telecardiology, teledermatology, telepathology, teleophthalmology, telepediatrics, telepsychiatry and teleodontology. Each of these areas has been developed from different ICTs advances and development of protocols, equipment and personnel training for the development of: teleducation, telementorship, teleconsultation, telediagnosis, telesurgery, teleuci, teletrauma and telerrehabilitation, among others.

It is important to highlight what was expressed by Haidegger, Sándor and Benyó[1], which show that telemedicine has led to the development of telesurgery protocols in space, in order to ensure care for health problems faced by astronauts of NASA missions and the Space Station. Studies and experiments in space have tested the development of mechanisms, medical equipment skills and the necessary telecommunications structure. The results obtained through this have demonstrated that telemedicine becomes an effective form of access to health services in the most distant places in a safe and timely manner.

In the same descriptive way, Ortiz[16], expresses that in terms of a temporal factor, telemedicine can be classified as

synchronous and asynchronous. The first of these refers to services in which the health professional meets the patient, as well as clinical and diagnostic support, at the same time, i.e. simultaneously. As for the second, this includes all services in which data and images are stored for later consultation or referral for reading by a specialist.

In the same succession of categorizing ideas, based on time and the synchronicity of the connection one has three groups:

- The first category refers to processes in which there is only one way of communication, therefore, the data are sent for offline contact to be evaluated by relevant professionals who then send the results of their analysis to the place of origin.
- The second category enables health professionals to collect information from patients remotely using different sensor modalities.
- the third category refers to real-time communication between two sites, which can be extended through different forms of interaction, thus allowing a wide range of telemedicine services to be provided.

As it has been evidenced that the use of telemedicine offers important advantages over health services, one of these is robotics, as an impact of services at short distances. As for long distances, the most important variables are: cost, reduction of customer service times, high quality service and others. At this point also highlights the services provided in the space where the way to provide medical service is more than remote[1].

DISCUSSION

When the present bibliographic review article was initiated, clear objectives were established to carry it out. With reference to identifying the advances or difficulties that telemedicine has presented as a tool for access to health services in Colombia, it is important to point out that telemedicine has made advances from the 1980s to the present, in which a section of laws and regulations has been established according to the use of telemedicine as an aspect of notorious improvement in the country's health services. Similarly, at the academic level, important universities and institutions such as the Universidad Nacional de Colombia (UNAC), the Universidad Distrital Francisco José de Caldas, the Instituto Tecnológico de Electrónica y Telecomunicaciones and others have made their contribution to make telemedicine a new approach to the country's health services. However, all the progress made so far, there are still barriers that do not allow it to reach every corner of the country. These barriers are manifested in many technological, organizational, human, economic, legal and other areas[5].

From the technological point of view, in Colombia there is broadband Internet, a point in favor of health services through ICTs, however, not all health centers have a computer with suitable conditions for a teleconference, even more in geographically inaccessible places where the economy and resources do not reach the same way as other major cities. It is also necessary to emphasize that the technological level is the lowest barrier due to the substantial advances of the same throughout the world, where Colombia is no exception.

From an organizational point of view, IPS networks and health coverage and centers that can carry out telemedicine services still have an enormous field to travel, establishing an important telemedicine network in the country is still a challenge for this. The human point of view is related to the training and formation of professional doctors to carry out this task and although the advances have been significant, only professional doctors have the skills that allow them to practice telemedicine. It is also important to emphasize that these professionals must have knowledge in different areas, such as medicine, telecommunications, robotics, use of ICT and other necessary health services provided through telemedicine.

The economic issue should be promoted by the State, institutions, the private sector and others in order to change from the conventional paradigm of health to telemedicine and its benefits, especially for the country, in which many Colombians live in rural and remote areas where there is no pediatrician, internist, gynecologist or any other medical specialty.

The juridical aspect as it has been expressed in previous chapters has empty numbers that must be coupled to the level of advancement of technology, which will allow a section of rules and laws that will allow access to health services for the vast majority of Colombians. In the words of the American Hospital Association (AHA, 2015), the existence of legislation that does not reflect the growing use of technology.

Referring to the use of ICTs in telemedicine in Colombia as a means of reducing physical barriers to access to health services. It is notorious that this alludes to technology, which has had an important growth, ICT and its advance have allowed a wide field of application of health, which allows remote diagnostics, use of robotics in short distances that have allowed the growth of telemedicine in the region.

CONCLUSION

In conclusion, telemedicine has represented an important advance in health and telecommunications worldwide, which have eliminated physical, economic and organizational barriers so that the health service reaches the most remote places in the world. In Colombia there have been important advances, promoted from the academic, technological and organizational, however there are still different barriers that must be minimized to make telemedicine a new way of providing health services. Finally, it is emphasized that telemedicine must be strengthened in the medium term, telemedicine is not of the future, and if it were so, the future is today.

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