

Original Paper

Integrated Multidisciplinary Diagnostic Service Using a Telemedicine Platform

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REZUMAT

Serviciu integrat de diagnostic multidisciplinar ce folosește o platformă de telemedicină

Obiectivul primar al acestui proiect a fost de a dezvolta o platformă funcțională de telemedicină pentru diagnostic multidisciplinar, în timp real, de la distanță, și a dovedi eficiența acesteia.

Metodă: proiectul a dezvoltat echipamentele pentru deplasarea instrumentarului medical la domiciliu pacientului, instrumentele de comunicare și softul pentru transmiterea informațiilor specializate, cât și un algoritm de colaborare multidisciplinară.

Concluzii: proiectul a obținut rezultate pozitive în implementarea platformei de telemedicină, care aduce servicii medicale pacienților vârstnici sau greu deplasabili, ce necesită consulturi multidisciplinare.

Cuvinte cheie: telemedicina, echipamente medicale, IT, comunicații, calitatea vieții

ABSTRACT

The primary objective of this project consists in developing and testing the effectiveness of a telemedicine service for multidisciplinary diagnostic and treatment.

Methods: The project have been developed as hardware and software and then the algorithm for communicating, collaborating and feeding-back for the on-line panel of specialists was tested in a clinical setting.

Conclusions: The project contributes to an improvement of the quality of life, filling a gap between medical services and existing demands, which is now partially covered by emergency services, saving time for patients and emergency units.

Key words: telemedicine, medical equipment, IT, communication, quality of life

INTRODUCTION

The term of telemedicine involves the use of medical information sent between two or more sites via electronic communication means, having as an ultimate goal the improvement of patients' clinical condition. After already four decades of development and practical use of this

diagnostic and treatment modality, with demonstrations in hospitals extending their remote healthcare services, the use of telemedicine extended rapidly, now being integrated in different current operations in hospitals, specialty departments, home care agencies, private practice offices, and also in different workplaces or residential sites, benefiting nowadays of a variety (constantly increas-

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ing) of applications and services using bi-directional video broadcasts, e-mail services, smart phones, wireless devices and other forms of telecommunication technology. (1,2)

OBJECTIVE AND METHOD

The present project, first of its kind in Romania, created by Gnosis Evomed and initiated in the autumn of 2013, was entitled „Integrated service of multidisciplinary diagnostic using a telemedicine platform” (acronym MultiMED, ID 1714), being co-funded via the European Fund of Regional Development, according to the funding agreement with the Ministry of National Education having the quality of Intermediate Organism, in the name of and for the Ministry of Economics having the quality of Management Authority. (3)

The primary objective of the project is the development of a diagnostic and treatment service originated in the patent registered at OSIM under no. A/00630/30.08.2012 and entitled „Metodă de diagnostic complet prin integrarea on-line a unui panel de specialități medicale ce interacționează în timp real și sistem necesar pentru implementare”, internationally registered at WIPO with the title "Complete diagnostic method and implementation system by on-line integration of a real time interacting panel of medical specialties", no. PCT/RO2012/000029. (3)

RESULTS

The implementation of the multidisciplinary interaction protocol, conceived in the research phase of the project, resulted in a telemedicine system, called Multimed. This, enables the interpretation of the lab tests and other medical investigations by a multidisciplinary team of medical specialists, situated in different locations, using a specialized application that runs on any mobile device, to view, interpret and discuss the results of medical tests and investigations and to determine a consensus diagnosis and an appropriate treatment. The system consists of 8 mobile intervention teams, one call center that schedules and manages the medical team of doctors and pool of specialists.

The study technical solutions were applied on a group of 40 patients in the development phase and 50 patients in the closing stage of the project created clinical and marketing results that confirmed the expected results of the project.

Since 2014, the telemedicine system prototype was presented at various national and international events, enjoying significant appreciations. Thus Evomed Gnosis managed to win at the 42 edition of the International Fair of Inventions in Geneva, the special prize of emergency services and safety of Geneva city (the equivalent of the service, SMURD Romania). At the award ceremony it was highly appreciated the major contribution that this invention can have to improve the quality of life of

patients by filling an empty field for medical services, in situations that can be considered grave but not emergency and at this time are consuming the resources of the emergency services.

The market introduction of this telemedicine system, that proved reliable and effective, is the final stage of this project and is underway.

DISCUSSIONS

At the national level, the applications for this platform are numerous, first due to the usefulness as an alternative to the public or private health providers in the areas where there is a lack in availability of clinics or they are insufficient or less equipped. Furthermore, the access to care is facilitated for a special category of patients such as those with difficulties in locomotion (elderly or persons with a locomotor disability). In this case, this innovative service brings a considerable enhance in quality of life. Furthermore, in our pilot project, the service proved to be beneficial for the patients with concomitant co-morbidities in which the therapeutic decision needs the quick opinion of the specialists in different medical specialties.

The studies suggest that tele-consultation is acceptable to patients in a variety of circumstances, but issues relating to patient satisfaction require further exploration from the perspective of both clients and providers (4, 5).

The emergence of new topic areas in this dynamic field is notable and reviewers are starting to explore new questions beyond those of clinical and cost-effectiveness (6, 7).



Figure 1. Shockproof bag with laptop, EKG and Holter, electronic stethoscope, spirometer



Figure 2. Mobile unit with shockproof bags for ultrasound, EEG, EKG, dermatoscope, laryngoscope, retinoscope, otoscope. The blood test devices are at the back of the car connected to a central computer

Most reviews have concluded that there is not much difference in the cost-effectiveness when delivering health services via telemedicine or by conventional means. It also becomes useful as an economic evaluation framework for decision makers (7, 8, 9).

There are also differences in the demographic characteristics of those who ask for telemedicine services, for example younger persons who prefer it for convenience reasons, but also for lower transportation costs (8, 9, 10).

The decision factors must take into consideration that investments in telemedicine won't bring clinical or economical benefits, but most probably patients with a higher risk for a sudden, severe evolution will appreciate it (10).

It is necessary that long term studies should demonstrate the persistence of the benefits proved in these limited studies.

CONCLUSIONS

This project contributes to a higher quality of life through completing a lack of medical services for which

there is a demand from the patients.

The project proves that a protocol for a multidisciplinary panel to work online, remotely, in real time, on a clinical case, can provide a quick diagnosis and complete a patient evaluation.

MultIMED has proved that it can bring specialist doctors in areas with low health coverage, with a minimum of human and financial investment, but bringing valuable medical tests and diagnosis to these populations.

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