Application of Telemedicine during Covid-19 pandemic: ASL of Benevento experience with the use of "eCovid Sinfonia"

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Abstract— The development of telemedicine involves different areas: telephone consultations between doctor and patient, reports of diagnostic-instrumental tests, consultations between professionals for second opinion, home monitoring of vital parameters, first aid triage in emergency-urgency, as well as research or continuous training of health professionals.The health emergency from Covid-19 has made the importance of providing services and care even remotely even more evident. For this reason, the Campania Region (South Italy) has created a telemonitoring system for Coronavirus positive patients through the e-Covid SINFONIA App: a convenient and easy-to-use tool created to facilitate citizens during the Covid-19 emergency with which they can learn about results of antigenic, molecular, rapid and serological test, book vaccinations and, precisely, allow the monitoring of one's health status.

Key Words— Covid-19, Public Health, Telemedicine, ASL Benevento, eCovid Sinfonia.

1 Introduction

The term "telemedicine" was first introduced in 1970 by the American Thomas Bird to indicate "the practice of medicine without the usual physical confrontation between doctor and patient, using an interactive multimedia communication system". This definition testifies how the original impulse for the development of telemedicine was of a technological type while, in a modern perspective, telemedicine instead tends to be increasingly seen as a support tool for the creation of innovative models of organization and delivery of health care. In simple terms, it means giving doctors and healthcare workers the possibility of providing assistance to their patients even at a distance, using computers, smartphones or other connected devices. So, if the original goals of telemedicine were to make health care more accessible to people living in rural or isolated communities and to facilitate access to health services for people with reduced mobility, over time the goal of telemedicine services has been to improve the quality of health care [1]. Therefore, facilitate access to medical specialists, improve communication and coordination of care between members of a health team, support the patient in the management of therapies. The development of telemedicine involves different areas: just consider telephone consultations between doctor and patient, reports of diagnostic-instrumental tests, consultations between professionals for second opinion, home monitoring of vital parameters, first aid triage in emergency-urgency, as well as research or continuous training of health professionals [2].

2 Telemedicine

2.1 What are the advantages and benefits of telemedicine

Wthout prejudice to the fact that telemedicine must be considered alongside and in support of traditional medicine, its benefits are reflected both on health facilities, on doctors, and on patients and citizens in general: 1) From the point of view of doctors and specialists, it means being able to follow a greater number of patients, even outside their geographical area, also extending the hours of availability beyond the hours set by the health facilities. Another not negligible advantage is that the use of telemedicine reduces the percentage of "no shows" that is missed or postponed appointments. 2) From the point of view of patients, however, telemedicine assigns not only them, but also their family members or caregivers, an active role: it is up to the doctor to teach the patient to take care of himself, but it is then the patient's task to follow indications, prescriptions and therapies. 3) From the point of view of the health system, in addition to improving access to care by multiple subjects, telemedicine is a valid support for the management of workflows in the clinical setting. Supported by communication and collaboration tools, it allows a more effective management of

the individual case, of priorities and of the decision-making process. 4) From an economic point of view, always bearing in mind that it is not a substitute practice with respect to normal health services, television has a much lower impact on management costs [3].

2.2 Telemedicine during the COVID-19 pandemic

Telemedicine is certainly not new: it has been talked about for at least twenty years but it came to the fore in December 2020 when the Ministry of Health included it among the practices authorized by the National Health Service as a response to the need for resilience in the health care sector folded by the COVID-19 pandemic. In fact, the health emergency linked to the COVID-19 pandemic has made it even more evident the importance of providing services and care even remotely not only to ease the pressure on hospital structures but also for the legitimate fears of patients of contract the virus by going to clinics, hospitals or treatment centers in general [4]. In this urgent situation, telemedicine initially represented a compromise with respect to the traditional provision of hospital care or face-to-face visits, and was then also taken into consideration as an opportunity [5].

2.3 The reasons for promoting telemedicine today

Precisely in the light of the pandemic underway, some reasons have been highlighted why it is not only convenient but also appropriate to promote telemedicine: 1) In the first place, it allows better protection of both healthcare personnel and patients. Both doctors and patients are now more likely to carry out routine checks and screening visits electronically, opting for a face-to-face visit for the most critical situations;
2) Second, we have seen how senior residential communities have been hit hard by the pandemic. Also in this case, the use of telemedicine allows to improve assistance and management, especially with regard to routine visits and health screenings, reducing hospitalization rates [6]. But even outside the residences for the elderly, there is a proven need to safeguard people over 65 years of age and other frail people at high risk and telemedicine makes it possible to meet their care needs, without forcing them to go out home [7]. The direct consequence of the minor hospitalization of fragile patients or patients with minor pathologies, which can also be followed at home, is an easing of the pressure on healthcare facilities: healthcare personnel can better deal with the most acute cases and in any case a greater availability of places remains read in case of worsening of the epidemic curve [8].

2.4 What are the limits of telemedicine

As already underlined, telemedicine must be understood as a form of complementary assistance and treatment and in no way substituting for traditional medicine [9]. The most obvious limitation of telemedicine is the impossibility of "physically" visiting the patient, of not being able to perform, through a computer screen, maneuvers that can be diagnostic in some cases [10]. Precisely for this reason it is important to understand when and how much to use it, always having in mind the needs of patients [11].

3 ECOVID SINFONIA

3.1 The use of the SINFONIA e-Covid App in the Campania Region

The health emergency from Covid-19 has made the importance of providing services and care even remotely even more evident. For this reason, the Campania region (South Italy) has created a telemonitoring system for Coronavirus positive patients through the e-Covid SINFONIA App, a convenient and easy-to-use tool created to facilitate citizens during the Covid-19 emergency with which they can learn about results of antigenic, molecular, rapid and serological swabs, book vaccinations and, precisely, allow the monitoring of one's health status (Fig.1).

Fig. 1. Web Application eCOVID SINFONIA.

4 DISCUSSION

Covid-19 epidemiological emergency has led to the need to identify new organizational models able to respond to the care needs of patients. From here it was born the experience of So. Re. Sa, an instrumental company of the Campania Region. To ensure that the monitoring process on the whole regional territory was carried out in an effective and uniform way, the Campania Region has created a platform for the active surveillance of Covid-19 positive patients or quarantine called “e-COVID SINFONIA”. The platform designed and managed by Soresa, implements the regional operational protocol for the care and home management of patients suspected / affected by Covid-19 from May 2020. Operators engaged in the health emergency with personal credentials had the opportunity to register the molecular test (Covid-19 PCR test) that were carried out on a single regional platform. Each operator, after having recognized the patient to be swabbed by viewing documents such as an identity card or passport, uploads his / her tax code to the platform [12]. Each patient has their own page, where their sensitive data (date of birth, residence, domicile, telephone number) are uploaded and where the patient authorizes the processing of personal data [13]. The second page loads the execution of the buffer: place, date and time. This generates a unique code which is affixed to the test tube. Through that code, the laboratory will be able to identify the patient and upload the result and report. The next day, the list of patients who tested positive opens. Each Local Health Authority (ASL) will have a list of its residents or domiciled. In addition to the ASL and the laboratories associated with them, the "accredited" laboratories, i.e. authorized by the Campania region, can upload patients and reports [14]. When a healthcare professional registers a buffer, they can specify whether it is the first or

subsequent diagnosis buffer or screening buffer. Subsequently, the platform was expanded with the ability to also load rapid antigenic swabs. This possibility was given to the ASL, hospitals, private centers and pharmacies accredited by the Campania region. It is also possible to load serological tests, describing the method used, the presence of IgG or IgM and also their single value [15]. Also, from the SINFONIA e-Covid platform you can centrally manage the list of subjects exposed (at risk), object of the verification and identification survey, so contact tracing. The Regional Health Service is called to deliver services to persons obliged to quarantine or in home isolation. These services have the dual end of help to contrast the diffusion of Covid-19 and to assure the continuity of care and assistance, to which people have a right. The patients isolated in their own home are followed not only by their doctor of general medicine, but also by health professionals (doctors and nurses) of the Local Health Authority. Daily, in the “Contact Tracing Home” screen, and precisely in the Positive to Interview section, we visualize positive patients on swab reporting. For each positive patient is generated an identifier “Number Case”. The tracing begins: date of interview, symptoms, hospitalization, date of admission, hospital, ward, isolation extension, isolation end date, isolation ending days, work done, place of work, any travels and countries of origin [16]. Once the interview is over, the control molecular swab must be reserved at your health authority. Following the rules of the Ministry of Health, those exposed will observe a mandatory quarantine of ten days if not vaccinated or one week if vaccinated [17]. Once the procedure is completed, the Sinfonia system sends in automatic the positive patients in home isolation. This last will be visible in the Positives with Interview Completed section. One year after the birth of the “eCovid Sinfonia” platform, thousands of citizens were followed and monitored for their health (Fig.2).

hrough the “Allegato7” function, the platform allows you to have an overview of all current positive patients. In Italy “Allegato7” is a nationwide notification method of Covid-19 infection. Every day the list of positives is updated through this operation. This is important in the notification process of infectious diseases, of Covid-19 infection in this case. Each ASL sends the daily database of positive patients to the Region and the Region can transmit them to the Central Government of Public Health. In this way the database of positive patients is always updated and it is possible to create reports at local and national level. The incidence and prevalence of Covid-19 infection are always updated thanks to the use of the eCovid Sinfonia platform. In addition, the informatic system of the digital platform allows the patient's recovery to be updated. By loading the negative tests performed, the system updates the list of healed. These must always be validated by a healthcare worker who verifies healing and sends the number of healed or clinically cured patients to the central system for the transmission of reports. Daily, eCovid Sinfonia system also makes it possible to update the list of the deceased and hospitalized. All this is done together with another digital platform: ISS platform, a national platform for the global monitoring of positive patients in Italy.

Fig. 2. Activity monitoring after one year from the start.

5 CONCLUSION

Telemedicine is proving to be increasingly useful and effective in healthcare. In Campania Region (South Italy) a digital platform has been created for the management of Covid-19 positive patients: “eCovid Sinfonia”. The health emergency caused by the pandemic has shown that telemedicine is a valid adjuvant tool in health care.

Conflict of interest statement

The authors declare they have no competing interests that could have influenced the work.

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