

Clinical pharmacy and telemedicine: an opportunity to improve epilepsy management

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ABSTRACT

Clinical pharmacy, as defined by the European Society of Clinical Pharmacy, is a comprehensive professional practice encompassing all pharmacist profiles regardless of the setting. It focuses on promoting optimal drug utilization for patient-centric clinical outcomes. Telemedicine leverages information and communication technologies for remote healthcare delivery, bridging geographical gaps. The integration of clinical pharmacy and telemedicine is crucial in modern healthcare paradigms, especially for patients with chronic illnesses. In 2021, marketing authorization was granted for cenobamate as adjunctive treatment for focal-onset seizures with or without secondary generalization in adults with epilepsy who have not been adequately controlled despite a history of treatment with at least two antiepileptic medicinal products. This review emphasizes the synergistic role of clinical pharmacists and neurologists in utilizing telemedicine for patient counselling, drug information dissemination, adverse drug reaction surveillance, and personalized medication management within the context of epilepsy care. This integration could enhance patient safety, therapeutic outcomes and address socio-economic challenges faced by chronic patients.

Keywords: Clinical pharmacy, Epilepsy management, Healthcare integration, Telemedicine

Introduction

In a recent statement published by the European Society of Clinical Pharmacy, clinical pharmacy is defined not only as a research scope but also as a professional practice reserved for every profile of pharmacist, regardless of the setting: community, hospital, and territory. This practice is aimed at promoting and optimizing the use of drugs to achieve clinical goals oriented toward patient and public health (1).

This definition opens the door to integrated approaches for developing new care models in primary care contexts. In this scenario, the acquisition of clinical competencies is paramount to effectively meet all patient needs. Above all, this cultural advancement fully embodies “pharmaceutical care”, which involves ensuring therapeutic adherence and prescription appropriateness in patient care. Collaboration between pharmacists, clinicians, and the National Health Service is strategically significant in this context.

Many efforts are underway in Italy to promote the practice of clinical pharmacy in hospitals and within the network of community pharmacies. This initiative is facilitated by services for pharmacies first identified in Law No. 69/2009 (2), which enabled the creation of new public services with significant socio-health value. One such service that aligns closely with the competencies of clinical pharmacists is “medication review” (MEDREV). This counseling aims to correct the dosage of prescribed therapies, identify and report suspected adverse reactions, evaluate possible drug-drug interactions and drug-supplement interactions, and assess any risks associated with drug assumption during pregnancy and breastfeeding. Counseling sessions can be conducted through interviews with the pharmacists in dedicated rooms or through accessible platforms and databases (such as INTERCheck-Web) (3) or by consulting scientific literature using an evidence-based medicine (EBM) approach.

Telemedicine for delivering health services

In the context of clinical pharmacy, telemedicine plays a prominent role. The World Health Organization (WHO) defines telemedicine as “the delivery of health-care services, where distance is a critical factor, by all health-care professionals using information and communication technologies (ICT) for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries all in the

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interests of advancing the health of individuals and their communities” (4). Telemedicine is not a separate medical specialty; rather, it represents a distinct approach to delivering healthcare services.

In 2008, the Commission of the European communities enacted European Communication 689 on “Telemedicine for the benefit of patients, healthcare systems, and society”. This communication directed Member States to undertake all necessary measures to integrate telemedicine services into routine clinical practice (5). In 2014, the Italian Ministry of Health published the document “Telemedicine – National guidelines” (6). These guidelines define the activities that can be conducted through telemedicine, determine their inclusion within the Assistential Essential Levels (LEA), specify the appropriate settings for delivery, and identify the healthcare professionals authorized to provide telemedicine services. Additionally, the document established that digital services are to be reimbursed at the same level as in-person services by the National Health Service (6).

Digital health technologies were known well before the COVID-19 pandemic, but the crisis accelerated their adoption in the healthcare sector, leading to increased awareness among citizens, clinicians, and healthcare institutions (7).

In 2021, the National Recovery and Resilience Plan (PNRR) allocated 15 billion euros of European funds to improve primary care (7 billion euros) and to digitalize the healthcare system (8).

The digitalization efforts encompass integrated platforms, electronic medical record (EMR), big data, and artificial Intelligence (AI). Additionally, remote healthcare technologies such as telemedicine, teleconsultation, telemedicine prescriptions, telemonitoring, and telerehabilitation are part of these initiatives.

The objectives of telemedicine are as follows:

- to provide long-term remote healthcare assistance to reduce physical distance between healthcare workers and citizens;
- to link numerous healthcare professionals and promote communication among them for the integrated and multidisciplinary patient management;
- to enable early diagnosis and timely interventions for chronically ill patients receiving care at home;
- to enhance therapeutic compliance;
- to facilitate safe discharge and promote dehospitalization through improved coordination among healthcare providers.

Telemedicine plays a crucial role in improving patient-centered care and strengthening healthcare capacity, thereby reducing social inequalities stemming from the social determinants of health that disproportionately affect vulnerable populations such as chronically ill elderly patients, those with severe physical impairments, and individuals with mental disabilities. Furthermore, digital technologies and remote assistance can significantly support proactive healthcare governance and the integrated management of chronic patients.

Telemedicine for epilepsy management

Telemedicine can greatly improve the management of outpatient care for many chronic neurological diseases that are more prevalent with progressive aging. Epilepsy is one such condition, affecting approximately 65 million people worldwide. In Italy alone, there are about 600,000 individuals living with epilepsy, with around 30,000 new cases reported each year (9). People with epilepsy face elevated risks of mortality, cognitive deficits, anxiety, and depression. The global burden of epilepsy is substantial. A diagnosis of epilepsy brings about substantial disability, affecting the individual’s physical, psychological, and social well-being (10). These include challenges such as reduced self-esteem, strains on family dynamics, difficulties in relationships, limitations in leisure activities, and disruptions in professional life. Moreover, individuals with poorly controlled seizures experience higher morbidity and mortality rates, often dealing with additional health conditions, social stigma, and a diminished quality of life (QoL) (9).

The first-line treatment options for epilepsy include over 20 antiseizure medications such as carbamazepine, valproic acid, lamotrigine, clonazepam, and levetiracetam. The introduction of antiseizure medications over the past three decades has improved our ability to personalize treatment choices based on individual needs. However, these medications have had limited impact on seizure outcomes for individuals with refractory epilepsy (11,12).

In 2021, marketing authorization was granted for cenobamate as adjunctive treatment for focal-onset seizures with or without secondary generalization in adults who have not been adequately controlled despite a history of treatment with at least two antiepileptic medicinal products.

Treatment-resistant epilepsy has devastating effects on patients and their families. Therefore, this therapeutic option is crucial for adults with epilepsy experiencing focal onset seizures because cenobamate reduces seizure frequency, as evidenced by randomized controlled trials (RCTs) (13). The introduction of cenobamate could significantly change epilepsy management by providing an effective treatment option that reduces seizure frequency, thereby improving patient adherence to therapy and compliance. Improved adherence and compliance are critical in managing epilepsy, as consistent medication use is essential for controlling seizures and preventing breakthrough episodes. Moreover, cenobamate’s integration into treatment plans can also facilitate remote monitoring of adherence through telemedicine.

In the context of epilepsy, neurologists and clinical pharmacists could synergistically collaborate in shared control rooms and utilize telemedicine to reach patients at their homes for counselling, drug information, and adverse drug reaction surveillance. These specialists could work together in dedicated spaces to conduct tele-visits and telemonitoring, each contributing their unique expertise.

For people with epilepsy, telemedicine holds significant potential to enhance management, as follow-up visits for people with epilepsy focus more on clinical history and counselling rather than physical examination. In addition to consultation, telemedicine can also be used for remote



electroencephalogram (EEG) diagnostics and tele-neuro-psychology assessments (14). The Telemedicine Task Force of the International League Against Epilepsy (ILAE) has outlined recommendations regarding optimal practice in utilizing telemedicine for the management of individuals with epilepsy (14).

This collaboration can also facilitate the organization of antiepileptic drug distribution, thereby improving access to treatment. Home delivery of medications with remote clinical and pharmacological assistance could prevent unnecessary and stressful hospital admissions, enhancing patient safety and instilling confidence in their treatment plan. Given the importance of anthropological and cognitive-behavioural aspects in care processes, patients experiencing fear could find solace in expert specialists willing to listen to their concerns.

Telemedicine can also seamlessly integrate the communication between neurologists and clinical pharmacists. Through teleconsultation, they can remotely discuss the introduction of new medications or dosage changes, effectively eliminating potential distance-related issues. This integration is also advantageous for patients and caregivers, as teleconsultations can prevent the need for travel, which can be economically and logistically demanding, thereby reducing loss of work productivity and ultimately improving QoL.

Telemedicine has increasingly become an integral part of healthcare, offering significant potential for the management of chronic conditions such as epilepsy. In Italy, the use of telemedicine for epilepsy management has made considerable strides, particularly in the wake of the COVID-19 pandemic, which underscored the necessity of remote healthcare services. A national survey conducted during the COVID-19 pandemic highlighted how people with epilepsy struggled with follow-up difficulties and attempted to reach their doctors in various ways, often without success. This study emphasized the importance of establishing an efficient telemedicine programme devoted to epilepsy care (15).

Currently, telemedicine in Italy facilitates remote consultations, monitoring, and follow-up care for epilepsy patients, enhancing accessibility and continuity of care, especially for those in remote or underserved areas.

Despite these advancements, several challenges remain. One primary issue is the lack of standardized protocols and guidelines for telemedicine practices in epilepsy care. This inconsistency can lead to variations in the quality of care provided and may hinder the widespread adoption of telemedicine solutions. In this regard, research protocols such as TELEmedicine for EPilepsy Care (TELE-EPIC), which will provide robust RCT-based data for the application of telemedicine for the management of epilepsy, will be fundamental in establishing evidence-based guidelines (16).

Additionally, there is a need for better integration of telemedicine platforms with existing healthcare systems to ensure seamless data sharing and communication between healthcare providers. Another significant barrier is the digital divide. Limited access to high-speed internet and insufficient digital literacy can impede the effective use of telemedicine services.

To address these challenges and improve the future of telemedicine in epilepsy management in Italy, several steps can be taken. Firstly, establishing comprehensive and standardized guidelines for telemedicine practices in epilepsy care is crucial. These guidelines should encompass best practices for remote consultations, patient monitoring, and data management, ensuring consistency and quality across the board.

Secondly, investing in the digital infrastructure is essential. Expanding high-speed internet access and providing training programmes to enhance digital literacy can bridge the digital divide and make telemedicine more accessible and effective.

Lastly, fostering a culture of continuous improvement and innovation in telemedicine is vital. Encouraging research and development in telemedicine technologies and applications, and promoting collaboration between healthcare providers, technology companies, and policymakers can drive further advancements in this field.

In conclusion, while telemedicine has already proven beneficial for epilepsy management in Italy, addressing the current limitations and implementing strategic improvements can significantly enhance its effectiveness and accessibility. By doing so, Italy could set a benchmark for integrating telemedicine into the management of neurological chronic diseases, ultimately improving patient outcomes and QoL, and not least the resources of the healthcare system (16).

Conclusion

Telemedicine is a revolutionary opportunity for the management of epilepsy, a condition that causes numerous impediments to patients, involving the communication process. Teleconsultations and telemonitoring might be helpful to integrate into the standard of care, as it enables the patient to be seen and attended to as quickly as feasible. This method will ensure that patients' monitoring levels are adequate, ensuring prompt interventions, aiming to significantly lessen the burden on the healthcare system and increase patient compliance with their recommended treatment. Additionally, it could be a satisfactory substitute for expanding access to specialists allowing equal access to care to people residing in remote locations or those who have difficulty in travelling. The adoption and evaluation of telemedicine in epilepsy might make a real impact on individuals and healthcare systems.

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