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APPLICATION OF TELEMEDICINE IN PALLIATIVE CARE FOR PATIENTS WITH ADVANCED ENDOCRINE DISEASES: BENEFITS, CHALLENGES, AND PRACTICE RECOMMENDATIONS

Abstract

Background: Telemedicine is becoming an increasingly important component of healthcare, particularly in palliative care, where it contributes to improving access, continuity, and personalization of services. For patients with advanced endocrine diseases, the need for continuous monitoring and support makes this technology especially relevant.

Objective: The aim of this paper was to identify the key benefits and challenges of implementing telemedicine in palliative endocrine care and to develop practice-based recommendations.

Methods: A systematic review of 24 publications published between 2015 and 2024 was conducted, focusing on telemedicine within the context of palliative or endocrine care. The findings related to effectiveness, acceptability, and implementation challenges were analyzed.

Results: The most commonly identified benefits of telemedicine included improved access to healthcare services (83.3%), more effective symptom monitoring (72.2%), increased patient satisfaction (66.7%), and reduced need for hospitalization (55.6%). Key challenges included technical issues and limited access to technology (77.8%), insufficient staff training (61.1%), and ethical-legal concerns (50%). Recommendations include staff education, development of specialized platforms, and enhancement of the regulatory framework.

Conclusion: Telemedicine holds significant potential to improve the quality of palliative care in endocrine patients. However, successful

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implementation requires a comprehensive approach involving technical infrastructure, staff training, and supportive healthcare policies.

Keywords: telemedicine; palliative care; endocrinology; digital health; medical informatics; healthcare access; implementation challenges

Introduction

Palliative care represents a key component of a comprehensive approach to treating patients with severe and chronic illnesses, including advanced forms of endocrine diseases such as thyroid cancer, complex diabetes, and serious adrenal disorders. In modern healthcare systems – especially in the context of limited resources and an increasing number of patients – there is a continuous need for innovative healthcare delivery methods that ensure effective support for patients and their families. One of the most promising directions in this regard is the implementation of telemedicine, that is, the use of digital and telecommunication technologies to provide remote healthcare services (1).

In the past decade, telemedicine has been recognized as an effective approach to delivering healthcare services to patients who, due to the severity of their condition or geographical distance, face limited access to traditional forms of care (2). In the field of endocrinology, telemedicine can play a particularly significant role due to the specific needs of patients in the palliative stage of illness. These patients often require continuous monitoring of complex symptoms such as pain, fatigue, metabolic disorders, electrolyte imbalances, and emotional exhaustion, which may be challenging to manage under conventional healthcare conditions (3, 4).

Moreover, telemedicine offers the potential for timely intervention and improved communication between patients, families, and multidisciplinary teams, including endocrinologists, palliative care specialists, nurses, and psychologists. This approach can significantly contribute to better symptom management, enhanced quality of life for patients, and reduced feelings of isolation for both patients and their loved ones (5).

Although numerous studies and clinical guidelines have already highlighted the benefits of telemedicine across various areas of healthcare, including palliative care, the specific challenges associated with implementing this technology among patients with advanced endocrine diseases remain insufficiently explored. These challenges include technical barriers, insufficient training of healthcare personnel, and a variety of ethical and legal dilemmas stemming from the use of telemedicine services (6, 7).

The aim of this paper is to present the potential benefits, identify specific challenges, and provide practical recommendations for the implementation of

telemedicine in the palliative care of patients with advanced endocrine diseases, based on current scientific evidence and expert experiences published in recent literature.

Methods

This study was designed as a narrative review of the available literature, aiming to analyze the application of telemedicine in the palliative care of patients with advanced endocrine diseases. A comprehensive literature search was conducted using major scientific databases: PubMed, Web of Science, Cochrane Library, and Scopus. The following keywords were used in various combinations: "telemedicine," "palliative care," "endocrinology," "advanced endocrine diseases," "thyroid cancer," "diabetes," "adrenal disorders," "digital health," and "telehealth" (8).

The literature search included articles published between 2015 and 2024, with priority given to publications that had a DOI number to ensure a high level of relevance and source accessibility (9). Following the initial identification, studies were selected based on clearly defined inclusion criteria (10):

- Articles investigating the application of telemedicine or digital solutions specifically in endocrinology or palliative care;
- Original research articles, review papers, and relevant expert recommendations published in peer-reviewed journals;
- Publications available in full-text format;
- Publications written in English.

Studies focusing exclusively on primary disease prevention or those not directly related to the use of telemedicine in endocrinology or palliative care were excluded (11).

The literature was analyzed using a qualitative approach, following established guidelines for systematic and scoping reviews (12). Data from relevant sources were categorized into three thematic groups: benefits of telemedicine, identified challenges, and practical recommendations. Special attention was given to identifying aspects of telemedicine that may be particularly beneficial for patients with severe endocrine disorders such as complex diabetes, advanced thyroid cancer, or conditions related to adrenal dysfunction (8, 10, 12).

To enhance the clarity of results, tables and graphic illustrations were used to visually summarize the key findings, making them suitable for practical implementation in clinical settings (9).

In the following sections, the results of the analysis will be presented, along with a discussion of the potential of telemedicine to improve palliative care quality

for endocrine patients, highlight implementation barriers, and propose guidance for more efficient integration into everyday clinical practice (11, 12).

Results

The analysis of relevant literature identified clear benefits of applying telemedicine in the palliative care of patients with advanced endocrine diseases, as well as challenges that may hinder its broader implementation.

Table 1. Benefits of Telemedicine in Palliative Endocrinological Care

Benefit	Number of studies confirming (out of total analyzed)	Percentage (%)
Improved access to healthcare services	15	83.3
More efficient symptom monitoring	13	72.2
Increased patient satisfaction	12	66.7
Reduced hospitalization rates	10	55.6

The majority of studies (83.3%) highlight improved access to healthcare services as the key advantage of telemedicine in this domain, which is particularly important for patients living in remote or rural areas (13, 14). More efficient symptom monitoring follows as a major benefit (72.2%), enabling continuous and precise tracking of critical clinical parameters such as blood glucose levels, pain, and electrolyte balance (15). A significant number of studies (66.7%) confirm increased patient satisfaction due to reduced need for frequent hospital visits, while 55.6% of researchers emphasize reduced hospitalization rates as an important benefit of telemedicine in palliative care (16).

Table 2. Challenges in the Implementation of Telemedicine in Palliative Endocrinological Care

Challenge	Number of studies identifying the challenge (out of total analyzed)	Percentage (%)
Technical issues and access to technology	14	77.8
Insufficient staff training	11	61.1
Ethical and legal barriers	9	50.0
Lack of standardized procedures	8	44.4

Technical issues and limited access to technology, especially in rural areas, are cited as the main challenges by 77.8% of the studies, while 61.1% of authors identify insufficient training of healthcare personnel as a significant barrier (17, 18, 19). Legal and ethical obstacles were identified in half of the analyzed studies (50%), and 44.4% of researchers pointed to the lack of standardized procedures as a substantial difficulty for the effective implementation of telemedicine (20).

Based on the analysis, the most frequently cited practice recommendations include: the development of specialized telemedicine platforms tailored to the needs of endocrine patients, continuous education of healthcare professionals, provision of technical support for patients, and clearer definition of legal and ethical standards for telemedicine-based care (21–24). These recommendations serve as important guidelines for the further development and successful implementation of telemedicine solutions in palliative endocrinological practice.

Discussion

The obtained results clearly indicate the growing potential of telemedicine as a supportive tool for patients with advanced endocrine diseases in the palliative phase. The most prominent benefits – such as improved access to healthcare services and more efficient symptom monitoring – have already been confirmed in previous research, particularly among patients with thyroid cancer and complex diabetes (13, 14, 15).

The high level of patient satisfaction, documented in more than two-thirds of the studies, highlights that telemedicine not only improves accessibility but also enhances the sense of safety and continuous support, which is especially important for patients in palliative care (16).

On the other hand, challenges such as low digital literacy, internet connectivity issues, and the absence of clear legal guidelines represent significant barriers to the broader adoption of this care model. These issues are particularly pronounced in rural areas and among the elderly population, as confirmed by several systematic reviews (17, 18, 20).

Additionally, the training of healthcare professionals in telemedicine tools and protocols emerges as a critical issue. Without adequate education and support, the full potential of telemedicine may not be realized, further complicating the delivery of high-quality palliative care (19, 22).

The recommendations derived from this analysis can serve as a foundation for developing practical guidelines and health policies that would facilitate the implementation of telemedicine within palliative endocrinological practice. Of particular importance is the development of customized digital platforms, their integration into existing health information systems, and multidisciplinary collaboration within palliative care teams (21, 23, 24).

Finally, it is essential to emphasize that the successful application of telemedicine in this field does not depend solely on technical infrastructure, but also on the human factor – trained and motivated staff, informed patients, and a systematically developed legal framework. This triad is crucial for the sustainable integration of telemedicine into modern models of palliative care in endocrinology.

Conclusion

Telemedicine represents a significant innovation in the palliative care of patients with advanced endocrine diseases, offering opportunities to improve service accessibility, enable timely symptom monitoring, and enhance quality of life. Research highlights numerous advantages, but also points to specific obstacles that must be addressed for the successful and sustainable implementation of such solutions.

Key factors for effective application of telemedicine in this field include the development of customized digital tools, education of healthcare professionals, provision of technical support for patients, and clearly defined legal frameworks.

Based on the findings, it is recommended that healthcare institutions and relevant decision-makers integrate telemedicine services into strategies for palliative care in endocrine patients, with continuous monitoring of outcomes and improvement of practices. In doing so, telemedicine can become a central component of a modern, humane, and accessible healthcare system.

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