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CHALLENGES OF MODERN PALLIATIVE CARE. A NARRATIVE REVIEW

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ABSTRACT

Palliative Care (PC) is a person-centered, integrated health service designed to support patients with serious illnesses in living actively and with minimal pain until death. It addresses the diverse needs of patients with both cancer and non-cancer diagnoses, aiming to improve quality of life (QoL), relieve symptoms, and provide comprehensive support to patients and their families. Despite its well-documented benefits and recommendations for early improvement, contemporary palliative care faces numerous challenges that limit its effectiveness and accessibility. This article explores the multifaceted obstacles confronting modern palliative care, analyzing why current practices often fall short of meeting patient needs and proposing areas for improvement to ensure timely, equitable, and effective palliative care delivery worldwide.

Methods: The research methodology included an in-depth review if scientific articles available through databases such as Pubmed and Google Scholar. The team analyzed content from 2000 to 2025, placing special emphasis on the latest development. Through careful organization and validation, 83 of the most reliable publications were selected as the primary foundation for the study. The cited references of these publications were included in the analysis.

Results: The scientific studies in this work have demonstrated that palliative care faces major challenges including limited global availability, insufficient specialized workforce, restrictive and inconsistent eligibility criteria, and stigma associated with its terminology. The growing demand from aging populations and increasing cancer cases further strains resources, while financial burdens and a fragmented, under-regulated mobile app market limit effective symptom management and care delivery. Additionally, delayed access to palliative care, insufficient integration within health systems, ethical and legal complexities, and inadequate psychological support for patients and families contribute to these challenges. Emerging technologies like AI offer promise but require careful implementation to maintain person-centered care and address ethical concerns.

Conclusions: A well-functioning palliative care system is vital as it enables patients with serious illnesses to live actively and with improved quality of life, reduces symptom burden, and supports both patients and caregivers throughout the illness trajectory. Effective palliative care also has the potential to decrease healthcare costs by reducing unnecessary hospital admissions and facilitating care in preferred settings. Priorities for advancing palliative care include expanding service availability, revising eligibility criteria to focus on patient needs rather than prognosis, and improving education to reduce misconceptions and stigma. Sustainable funding, policy standardization, and multi-sector collaboration among healthcare providers, policymakers, patients, and communities are essential to building robust palliative care frameworks. Moreover, regulating and enhancing the accessibility of palliative care mobile applications can further support patients and caregivers by improving communication, symptom management, and advance care planning. Coordinated efforts across all stakeholders are crucial to overcoming existing challenges and ensuring equitable, high-quality palliative care that improves quality of life on a global scale.

KEYWORDS

Palliative Care (PC), Quality of Life (QoL), Hospice, Pain Management, Mobile Health (mHealth), End of Life, Barriers to Care, Health Service Delivery, Ethical Challenges, Artificial Intelligence (AI) in Palliative Care, Aging Population

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Introduction

Palliative Care (PC) states a person-centered, integrated health services system to help patients live actively and without pain until death [1]. It addresses the meeds of a higly heterogeneous group of patients with their individual needs and different medical conditions, including both cancer and non-cancer diagnoses [2]. For eligible patients, PC significantly improves care outcomes compared to those without access, and guidelines recommend its early involvement [3 − 5]. Clinical trials have demonstrated important benefits of early integration of palliative care, including improved patient-reported outcomes, better quality of life (QoL), reduced symptom intensity intensity, longer overall survival, and reduction of inpatient care costs [3,6 − 12]. Nevertheless, PC still faces many challenges that need to be addressed in order to provide appropriate, feasible, and globally accessible care. In this article, we discuss some of the most pressing issues to be addressed in the development of modern PC.

Limited availability of Palliative Care

Globally, the availability and delivery of PC are still insufficient in many regions, especially rural areas [4,13,14]. A limited number of countries have fully integrated PC services into their health care systems, and less than 15% of the global population is comprised of PC at the highest level of provision [15,16]. What is more, even in high-resource health systems, PC is not yet available for every patient with serious illnesses, and referrals to PC occur too late [4,17 − 19]. Block et al. indicates that new systems should aim at a large population of patients who could benefit from outpatient PC as the current model of specialized care is feasible for only a small groups of patients [20].

Insufficient health workforce

Another barrier is the insufficient number of medical and nursing staff with expertise in PC [21]. In the last decade, the existing physician workforce in the United States alone has been estimated at 11-15% of what would be needed to provide full access to PC services [21,22].

QoL in Palliative Care

The WHO proposed definition of PC is a milestone of changes that have taken place in the understanding of this type of care and its scope. In the context of PC, the WHO notably highlights the Quality of Life (QoL). What distinguishes it from earlier definitions is its shift away from placing primary emphasis on longevity, focusing instead on a more holistic understanding of health and quality of life [1]. Early focus on care aimed at improving QoL has been shown to improve patient and caregivers satisfaction, reduce depression and anxiety, and lead to care more consistent with patient preferences [2,12]. Plenty instruments are available to measure health-related Quality of Life (QoL), and several appropriate for use in palliative care have been identified [23]. In palliative care, where an evaluation of QOL is of high importance no questionnaire fits all purposes and individuals [24], therefore there are many in use [25]. On the other hand, formal assessment tools provide objective evidence and facilitate evaluation and comparison between different [26]. Lack of consensus regarding the selection of best approaches to measuring QOL and great heterogeneity of chosen tools generates a significant burden for research and evaluation of performance at the end of life care [25].

Naming Palliative Care

Chamberlain and Cacchione suggest that how we name and describe end-of-life care may be a barrier to patients' acceptance and participation in these care options. For example, the term PC evokes more negative emotions and is less preferred by staff and patients' families, in contrast to SC [27]. What is more, surveys revealed that the term PC is poorly understood, and many respondents identify it with death [28]. On the other hand, any alternative term when linked to dying or death diminishes the phenomenon of initial positive [29 − 31]. Health professionals, moreover, use many terms interchangeably, what creates another burden for building a consensus on the definition, use, or eligibility of PC [31], and, importantly, definitions of PC and SC remain insufficiently clear, with many inconsistencies in the literature [31 − 35]. Therefore, we foster patient misinformation in the context of access to palliative care and its understanding. Boldt suggests that those who regulate such care can contribute to these perceptual problems by establishing disturbing eligibility criteria that perpetuate the image of palliative care as no treatment and close-to-death [27].

Palliative Care Eligibility criteria

A significant problem with palliative care eligibility criteria is their variability, ambiguity, and restrictive nature, which can delay appopiate access to care. In many healthcare systems, eligibility is often limited to patients with certain specific diseases, mainly cancer, and a limited life expectancy, typically of 6 to 12 months. This narrow focus excludes patients with other serious illnesses such as organ failure, frailty, or progressive neurological dysfunctions who might also benefit from palliative care [36].

Moreover, these traditional eligibility criteria often emphasize a "terminal phase" or "end-of-life" status, reinforcing the misconception that palliative care is only appropriate when curative treatment has ceased [4,36]. This prognosis-centric approach often delayes referrals until the very late stages of illness, limiting patients' chances to benefit from early palliative care interventions [4,37]. The problem is compounded by patients' own self-perception of health. Many patients do not perceive themselves as "ill enough" to qualify for palliative care, even when they meet clinical criteria [37]. Furthermore, the strong association of palliative care with imminent death and hospice care fosters reluctance among patients and caregivers to accept referrals, often driven by misconceptions or fear regarding the term "palliative care" itself [37].

Overall, these issues underscore an urgent need to expand eligibility criteria beyond prognosis-based measures to incorporate needs-based assessments of symptom burden and complex care needs [36]. Standardizing referral criteria and improving communication to clearly differentiate palliative care from hospice or end-of-life care could promote earlier, more equitable access to essential palliative services for diverse patient populations [36,37].

Various Eligibility Criteria for Access to Hospice and Palliative Care Services Worldwide

Eligibility criteria for palliative care vary widely across countries, influenced by differences in health system structures, resource availability, and policy frameworks [15]. Referral guidelines have been developed internationally through consensus processes to standardize criteria, such as severe distress levels or specific clinical complications - aiming to ensure timely and appropriate access to palliative care [38]. To provide comprehensive care that addresses both disease management and quality of life, the integration of palliative care within oncology services is crucial [39]. Two primary models describe this integration: the consultative model and the integrated model, each with distinct advantages and global usage patterns [38,39].

The consultative model, in which specialist palliative care teams are engaged upon request by primary oncology or other medical team, is more commonly used in many countries, especially where resources are limited and traditional care structures prevail [38,40]. For example, in the United States and parts of Europe, this model predominates in hospital-based settings. In this approach, the primary team retains responsibility for overall patient care, with palliative specialists addressing complex symptoms, facilitating goals of care discussions, and planning end-of-life care as needed. This model is typically implemented later in the disease trajectory, when symptom burden increases, and palliative care teams may gradually assume more responsibilities as illness progresses. Its advantages include the efficient use of limited specialist resources and the ability to target specialist expertise to patients with complex needs, which can be especially important in health systems facing workforce shortages [38].

In contrast, the integrated model incorporates palliative care early and systematically alongside disease-modifying treatments, providing concurrent symptom management, communication, and psychosocial support from the time of diagnosis [41]. This model is more common in countries with advanced palliative care systems, such as Canada, the United Kingdom, and some Western European nations, where oncology and primary care providers have been trained in basic palliative skills, with specialists stepping in only for complex cases [39]. The integrated approach aligns closely with World Health Organization (WHO) recommendations and has demonstrated benefits in improving patient outcomes by addressing needs earlier and more comprehensively [41,42]. Its advantages include better symptom control, enhanced quality of life, earlier advance care planning, and potentially reduced health care costs through fewer hospitalizations and more care delivered in patients' preferred settings [41,42].

Despite its benefits, the widespread adoption of the integrated model faces significant global challenges. These include restrictive, prognosis-based eligibility criteria that limit access primarily to terminal-stage cancer patients, as well as broader systemic and legal barriers. For instance, strict opioid regulations, fragmented healthcare systems, outdated or inconsistent policies, and a shortage of trained providers. [40,43]. These barriers contribute to delayed and inequitable access to palliative care worldwide.

In summary, while the consultative model remains prevalent due to resource and structural limitations, the integrated model represents the aspirational standard recommended by WHO to ensure equitable, timely palliative care for all patients with serious illness, regardless of diagnosis or prognosis [42].

Growing Cost of Palliative Care

The growing cost of palliative care is a significant problem in modern healthcare systems. Delivering palliative care, whether at home or in inpatient settings such as hospices and hospitals, incurs significant costs that include staff salaries, medications, medical equipment, transportation, and facility expenses. While hospital-based palliative care has been shown to reduce hospital admissions and increase home deaths- potentially lowering overall healthcare costs- expanding services to meet the growing demand driven by aging populations and chronic diseases remains financially challenging. Governments often struggle to reallocate resources from acute care to palliative care, resulting in inadequate funding that limits service growth and accessibility, thereby restricting the benefits available to patients and their families [44].

Pain itself represents a substantial economic burden on families and healthcare systems and is a major driver of cancer-related emergency service utilization [45 – 47]. The prevalent over-prescription of opioids for pain management has further exacerbated this burden, contributing to an epidemic of opioid misuse and addiction [45]. In recent years, mobile health (mHealth) applications have emerged as innovative tools to support pain self-management and potentially reduce costs by empowering patients [48]. However, many of these apps require users to pay monthly or annual fees, raising concerns about equitable access, especially for patients from lower socioeconomic backgrounds who are disproportionately affected by chronic pain and may face financial barriers to utilizing such interventions [49]. Addressing these financial challenges of palliative care requires coordinated efforts to balance funding between acute and palliative services, improve access to essential medications including opioids while managing misuse risks, and ensure affordable access to emerging digital pain management tools. These measures are crucial for expanding palliative care services and improving pain management outcomes for all populations in need [44,45,48,50].

Palliative Care policy worldwide

Palliative care policies worldwide have evolved significantly, particularly since the 1970s, when palliative care began to be recognized as an essential component of healthcare systems. Despite growing recognition, its implementation and accessibility remain highly variable across regions. Approximately one-third of the global population still lacks access to palliative care for individuals with serious or terminal illnesses, underscoring the urgent need for robust policy frameworks and integration of palliative care into mainstream health services. The variability in definitions of palliative care complicates policy development and implementation, with organizations such as the WHO and the Worldwide Hospice Palliative Care Alliance (WHPCA) advocating for unified terminology to guide strategic planning [51].

Across high-income countries, various models of palliative care coexist, shaped by funding, policy priorities, and historical development. In the United States, for example, palliative care services are common in hospitals and hospices, but often operate within a consultative model, typically activated late in the disease trajectory [52]. In contrast, Australia and many Western European nations have adopted integrated models, providing coordinated, interdisciplinary care within both hospital and community settings, often concurrent with disease-modifying treatment [53]. Evidence from Europe, including the work of Siouta et al., indicates that such integrated approaches enhance symptom control, patient quality of life, and alignment of care goals [54,55]. Meanwhile, in Central and Eastern Europe, palliative care services frequently remain fragmented or limited to pilot programs, reflecting persisting gaps in policy, infrastructure, and funding [56].

A large-scale study covering 51 European countries found that the availibility of palliative care services in this region is still significantly below the European Association for Palliative Care (EAPC) recommendations [57]. Barriers include insufficient legal frameworks, lack of training and limited recognition of palliative care’s role beyond oncology. Nonetheless, certain countries, such Poland, have made substantial progress in expanding access, especially in hospice-based care, although coordination between medical and social sectors remains limited [58].

The development of comprehensive palliative care services depends heavily on national health policies, financial investments, and the engagement of diverse stakeholders. Funding and support from international organizations, governmental ministries, and NGOs are crucial to ensure sustainability. The International Palliative Care Initiative (IPCI) highlights the importance of collaborative policy design involving governments, healthcare providers, and communities to establish frameworks and roadmaps for expanding access to high-quality palliative care [51]. Without adequate financial commitment and systemic integration, progress remains slow and uneven.

Various stakeholders in Palliative Care

Palliative care involves a diverse group of stakeholders, including patients, healthcare professionals (such as physicians, nurses, social workers, and specialists), policymakers, insurance providers, community organizations, advocacy groups, and importantly, family caregivers [4,44,59]. Family caregivers are considered a vital part of the “unit of care” in oncology and palliative settings, reflecting a family-centered approach that acknowledges their crucial role, respects their opinions, and involves assessing their well-being - a factor often closely linked to that of the patient [60]. This approach contrasts with traditional patient-centered models that prioritize patient autonomy and confidentiality, which can sometimes lead to unmet informational and support needs for caregivers [60]. Caregivers provide essential information about the patient's condition and needs, and their involvement in decision-making is respected according to the patient's wishes [60]. Despite their central role, family caregivers frequently become “invisible” to the healthcare system as they prioritize patient needs over their own [59]. This invisibility can lead to significant caregiver burden, affecting physical, mental, social, and economic well-being [59]. Recognizing and integrating family caregivers as essential members of the care team is critical for enhancing outcomes for both patients and caregivers [59].

There are also other problems between different stakeholders due to differences in knowledge, communication, resources, attitudes, and systemic barriers. A significant issue lies in pervasive knowledge gaps and misconceptions about palliative care among patients, caregivers, and even healthcare providers [37]. Many patients and families mistakenly equate palliative care solely with end-of-life or hospice care, leading to reluctance in accepting these services [37]. This misunderstanding is compounded by healthcare providers, especially non-specialists, who often lack sufficient training and confidence to deliver palliative care or to initiate sensitive conversations regarding goals of care, prognosis, and advance directives [37,50,61]. Communication barriers worsen these challenges, with delayed referrals caused by ineffective patient-provider communication and hesitancy among physicians due to fear of upsetting patients or misunderstanding palliative care benefits [4,37]. Cultural factors and systemic resistance, including prioritization of curative treatments and death taboos, also hinder acceptance [51]. The term "palliative care" carries stigma, prompting calls for rebranding and public education to improve understanding and uptake [4]. Each stakeholder plays a unique role in delivering, supporting, or facilitating palliative care services, but the effectiveness of these services depends on their coordinated efforts.

Aging Population

The aging of society is often framed as a significant challenge because as populations grow older, there is an associated increase in the prevalence of chronic and non-communicable diseases, which typically require ongoing and complex care [44,50,51]. Older individuals frequently have multiple co-morbidities, making their healthcare needs more complicated and resource-intensive [51]. This complexity demands a healthcare workforce with specialized training in palliative care, which is currently insufficient in many regions [44,50,51]. Moreover, older patients often require a range of services across various settings, including home care, hospitals, and nursing homes, which strains the capacity of fragmented health systems that are predominantly oriented toward curative rather than supportive care [44,51]. The perception of an escalating “burden” due to aging populations is often amplified in policy narratives, sometimes portrayed as a looming crisis or catastrophe. This framing can create a sense of urgency but also risks inducing helplessness or defensive responses within healthcare systems, potentially impeding the pragmatic integration and scaling of palliative care services needed to meet the growing demand [51]. Furthermore, there is concern that existing healthcare systems may not adequately support the unique needs of older patients, including effective communication about their values and preferences for care, which is essential for delivering patient-centered palliative care [61,62].

Growing number of cancer Patients

The growing number of cancer patients has significant implications for palliative care, particularly in addressing the increasing demand for effective symptom management and support. With approximately 18.19 million new cases of cancer reported in 2018 and projections suggesting this number will exceed 20 million by 2030, the incidence of persistent cancer pain during treatment is also rising [63].

As the patient population expands, the prevalence of untreated or inadequately managed symptoms—such as pain, anxiety, and psychological distress—poses a major challenge [40,63]. Reports indicate that about 69% of cancer patients experience daily pain, which can lead to serious psychosocial consequences, including anxiety and depression [63].

One major problem is the shortage of trained healthcare providers skilled in palliative care. Many healthcare professionals outside oncology lack adequate training in basic palliative care skills, and there are insufficient specialist palliative care providers to meet the growing needs [4]. Another significant issue is the late referral of cancer patients to palliative care services. Studies show that patients often receive palliative consultations only weeks before death, limiting the potential benefits of early integrated palliative care that include better symptom management and improved quality of life [4,37]. In addition, there are systemic challenges such as insufficient integration of palliative care within national health systems and the inconsistent availability of essential medications like opioids for pain management, particularly in low- and middle-income countries [4,50]. Regulatory restrictions and "opioiphobia" contribute to inadequate pain control, causing unnecessary suffering [50]. The increasing number of cancer patients intensifies the demand for palliative care services and underscores the importance of addressing the associated challenges to improve patient outcomes [4,50].

Delayed Access to Palliative Care

Access to palliative care is often delayed, which can significantly impact patient outcomes. According to the literature, many patients who would benefit from palliative care do not receive these services until late in their illness trajectory [37]. It is estimated that only about 14% of the approximately 40 million people who need supportive or palliative care each year receive adequate help [31,37].

This late application of palliative care can be attributed to several factors, including a lack of awareness among patients and healthcare providers about the benefits of early palliative care, reluctance to discuss end-of-life issues and the stigma associated with the term “palliative care”, which can evoke negative emotions [4,31,37].

Furthermore, the World Health Organization emphasizes that palliative care should be integrated early in the treatment process, alongside curative measures, to improve the quality of life for patients and their families [31].

Psychological Support for patients and their families.

One of the key elements of improving the QoL in PC is psychological and spiritual support [61,64]. Patients often experience existential suffering, grappling with questions about meaning, purpose, death, and legacy. Addressing these anxieties through psychological support helps patients find meaning and purpose despite their suffering. Psychological support also aids patients in coping with death anxiety, guiding them toward death acceptance and peace [64].

As well family and caregivers need support in this area as they are the substantial part of the PC [60]. The period that showed how important psychological support is for patients and families was the time of the covid-19 pandemic. Research conducted at that time showed that existential anxieties and grief experienced by palliative care patients often extend to their families. COVID-19 lockdowns have increased anticipatory, disenfranchised, and complicated grief among family members who are unable to see their loved ones in palliative care. Family members may also experience feelings of isolation and loneliness during this time [64].

A Holistic approach to PC can improve caregivers mental health, quality of life, and ability to provide care, which ultimately benefits both caregivers and patients[60,64,65].

However, effective psychological care in palliative settings involves interdisciplinary teams including psychologists, social workers, chaplains and other professionals, which are too few to meet the growing needs and provide sufficient care for the mental support [44]. Additionally, healthcare providers may lack sufficient training and confidence in addressing complex psychological and existential distress, particularly in non-cancer illnesses, where palliative care integration is less established. This is associated with difficulties in initiating and conducting conversations about end of life care and prognosis [65]. An important future focus should be to develop communication skills training and feasible interventions on other PC/EoL issues than breaking bad news, such as goals-of- care discussions or preparing for the future [65].

Pediatric Palliative Care

While palliative care is often associated with adult patients facing serious illnesses, it is essential to recognize that children with life-limiting and life-threatening conditions also require specialized support tailored to their unique needs. Pediatric Palliative Care (PPC) specifically addresses these needs by focusing not only on the child’s physical symptoms but also on their psychological, emotional, and spiritual development throughout childhood and adolescence [66]. Unlike adult palliative care, PPC must address the complexities of a child’s developmental stage and the unpredictability of their disease trajectory, which presents distinct challenges such as prognostic uncertainty and timing of interventions [67]. Adult palliative care generally deals with fully developed individuals with more stable cognitive and emotional frameworks [68].

This specialized care supports both the patients and their families, acknowledging the profound impact of serious illness on the family unit [67]. However, misconceptions persist among healthcare providers and families, often equating palliative care solely with end-of-life, leading to delayed referrals and underutilization of PPC services [66]. Cultural and religious beliefs may further influence parents to prioritize life-prolonging treatments and hesitate to accept palliative care, fearing it signifies giving up hope for their child [68]. Additionally, healthcare providers may lack adequate training or feel discomfort in discussing prognosis and end-of-life issues, which can affect their ability to effectively refer and integrate PPC [67].

Addressing these barriers, PPC development needs to focus on specialized communication adapted to development stages, cultural and religious competence, early integration with education, family- centered care, managing prognostic uncertainty and expanding workforce capacity [66 – 68]. These needs often exceed those in adult palliative care because of the unique characteristics and vulnerabilities of the pediatric population [66]. This comprehensive approach ensures that children and their families receive quality, compassionate care throughout the entire course of illness, reflecting the evolving understanding and importance of PPC within the broader palliative care framework [66 – 68].

Ethical and legal challenges in Palliative Care

Palliative care inherently involves complex ethical and legal considerations [69,70]. With the progress of medicine and increasing availability of life-sustaining technologies, healthcare proffesionals often face the dilemma of balancing treatment possibilities with the real needs and wishes of patients nearing the end of life [71]. These dilemmas are further complicated by varying cultural, religious and legal frameworks across healthcare systems [70,71]. Issues such as medical futility, informed consent and the appropriate use of palliative sedation are central to this discussion. This chapter explores the most pressing ethical and legal issues that shape palliative care delivery.

Medical futility refers to interventions that are unlikely to produce meaningful benefit for the patient [71]. Distinctions are often made between quantitative futility – where an intervention is unlikely to achieve its intended psychological goal, and qualitative futility – where the outcome may not provide sufficient quality of life [69,71]. Disagreements can occur when families or surrogate decision-makers request aggressive treatments despite clinical assessments deeming them futile [69]. These situations require transparent communication, compassionate explanation, and often institutional support through ethics consultations. Clear institutional policies on non-beneficial treatment are essential to guide practice [69,71].

Informed consent is a cornerstone of ethical medical care. However, in palliative care, obtaining valid consent may be complicated by cognitive decline, emotional distress or urgent clinical deterioration. It is vital that patients understand the nature and purpose of proposed treatments, their alternatives and potential outcomes. Respecting patient autonomy also means acknowledging the right to refuse treatment or demand care that clinicians might consider non-beneficial. These conflicts require sensitive negotation and often legal interpretation [70].

Palliative sedation involves the use of medications to relieve intractable suffering by reducing consciousness [71]. It is ethically distinct from euthanasia when used appropriately, guided by the principle of double effect – an action with both a good effect (relief of suffering) and a potentially harmful side effect (possible life shortening). However, the application of this principle is debated. Clarity if intent, proportionality and appropiate documentation are crucial to ethical justification [69,72].

Ethical and legal challenges in palliative care reflect deeper societal values regarding life, death and dignity. As the field continues to evolve, clinicians must be equipped not only with medical expertise, but also with ethical sensivity and legal awareness. Clear policies, education and open dialogue with patients and families are essential to support humane, justice and patient-centered care [69,71].

Lack of regulations in Palliative Care App Market

The palliative care app market has experienced significant growth in recent years, with a rapid increase in the number and variety of mobile applications aimed at supporting both clinicians and patients/families involved in palliative care [73,74]. These apps primarily focus on clinical guidelines (especially symptom management), advance care planning, training materials, pharmaceutical tools, and platforms for distributing palliative care news and opinions [74,75]. However, the quality and evidence base of these apps vary, and many lack adequate information to judge their effectiveness [74 – 78]. There is also a call within the professional community for developing a rating system to assess app quality [77].

For patients and families, there are fewer apps compared to clinician-targeted ones, but the market is growing [79]. Patient-oriented apps often focus on advance directives, general information about hospice and palliative care, legacy creation, and symptom tracking [79]. Yet, research on their effectiveness is limited, and many apps lack comprehensive features that address the full scope of palliative care needs [75]. Apps are also often fragmented, focusing separately on symptom management, decision support, education, or advance care planning rather than providing integrated solutions, which can burden users who must engage with multiple apps [80]. Furthermore, many apps target specific diseases, such as cancer or heart failure, which may limit their applicability to patients with multiple or different conditions [80]. A significant limitation is also the lack of inclusion and functionality for social convoys—family members, friends, and caregivers [47,80]. Most apps allow only one-way information flow, reducing the benefits of team-based care [80]. Accessibility issues arise from apps being mostly in English and limited to Android and iOS platforms, restricting reach in diverse populations [75,79]. Cost is also a notable issue in the palliative care app market. While the majority of palliative care apps targeting clinicians are available for free, some apps have associated costs, and more expensive apps tend to have fewer downloads [75]. Similarly, among apps targeting patients and families, many are free, but the cost factor can still be a barrier for some users [79]. Furthermore, the presence of in-app purchases in some apps adds complexity to the overall cost structure, which may not be transparent upfront [75]. Therefore, cost-related barriers, including app prices and hidden charges, can limit accessibility and widespread adoption of palliative care apps, compounding the challenges faced in this market [75,79]. There is a pressing need for user-centered design, integration of emerging technologies, and research to develop comprehensive apps that support communication, advance care planning, and caregiver involvement, to fully realize the potential of mobile apps in improving palliative care [73 − 77,79,80].

The role of AI in Palliative Care

Artificial intelligence has recently developed significantly and is increasingly being used in palliative care (PC) [81]. Recent advancements in AI, particularly in machine learning (ML) and natural language processing (NLP), can analyze large volumes of clinical data to identify patients who would benefit from PC, predict disease progression, which may facilitate timely-goals-of-care discussions and facilitate early and appropriate interventions [81,82]. These predictive models help personalize care according to individual needs and preferences, improving quality of life and emotional support for patients and families [81,83]. AI can also assist healthcare professionals by simplifying complex medical information, suggesting phrasing for difficult conversations, and supporting transparent communication and advance care planning [81]. Additionally, conversational agents powered by AI can provide accesible, personalized informational support to caregivers, addressing unmet needs outside of clinical settings [82]. The integration of AI in PC can reduce workload, optimize resource allocation, and improve the efficiency of healthcare delivery, including interpreter services for patients with language barriers [81].

However, the use of AI in PC raises both ethical and practical concerns [81,82]. Challenges include maintaining authentic, empathetic communication, as AI lacks true human empathy and the ability to interpret non-verbal cues or emotional nuances [81]. Another issue is the potential for AI to disrupt patient autonomy and the person-centered nature of palliative care. For instance, mortality-predicting algorithms might overly focus care allocation on patients nearing end of life, neglecting others with significant palliative needs [82]. Concerns also exist regarding data privacy, security, transparency, and potential biases in AI algorithms, which may exacerbate existing inequalities in care if underrepresented populations are not adequately included in training data [82,83]. Moreover overreliance on AI predictions may introduce cognitive biases in provider decision-making, such as automation bias, thereby undermining clinical judgment [82]. Overall, while AI offers promising advancements in PC planning, it must be implemented with caution, critical reflection, and a commitment to person-centred care to mitigate risks and uphold human dignity [81 − 83].

Conclusions

Modern palliative care faces multifaceted challenges that span clinical, ethical, systemic, and technological domains. As populations age and the burden of chronic, life-limiting diseases grows, the demand for high-quality, person-centered palliative care continues to rise. Yet disparities in access, insufficient integration into mainstream healthcare, and ongoing ethical dilemmas remain significant barriers. Improving palliative care requires early integration into the care pathway, interdisciplinary collaboration, and clear communication with patients and families. Ethical issues such as end-of-life decision-making and medical futility must be addressed within culturally sensitive and legally sound frameworks. At the same time, emotional and psychological support for patients, caregivers, and healthcare professionals must be recognized as an integral part of comprehensive care. Digital tools offer promising support in extending palliative services, especially in underserved areas, but their use must enhance, not replace, the relational core of care. National health policies should promote equitable access, provide adequate resources, and support ongoing education and workforce development. Ultimately, the future of palliative care depends on a collective commitment to uphold dignity, compassion, and autonomy for all patients facing serious illness. Bridging current gaps requires continuous innovation, policy reform, and a renewed focus on the human dimension of healthcare.

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