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ARTIFICIAL INTELLIGENCE IN THE ASSESSMENT AND MANAGEMENT OF CAREGIVER BURDEN: EMERGING OPPORTUNITIES AND ETHICAL CHALLENGES

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ABSTRACT

Caregiver burden is a multidimensional construct that includes the emotional, physical, social, and financial strain experienced by individuals who provide long-term care to persons with chronic illnesses, disabilities, and other health-related conditions. Although caregiver burden has been widely discussed in clinical psychology and healthcare research, the application of artificial intelligence (AI) in its assessment and management remains an emerging area of inquiry. The present paper explores the potential role of AI in identifying, monitoring, and understanding caregiver burden while critically examining the ethical issues associated with its use. Drawing upon existing literature on caregiver burden and recent developments in digital mental health, the paper discusses AI-based screening tools, predictive analytics, digital monitoring systems, and chatbot-assisted approaches that may contribute to the recognition of caregiver distress and facilitate access to relevant resources. At the same time, important concerns related to data privacy, informed consent, algorithmic bias, clinical validity, and the preservation of therapeutic relationships are considered. The paper argues that while AI presents promising possibilities within the context of caregiver assessment and support, its application requires careful ethical consideration, cultural sensitivity, and appropriate professional oversight. By integrating perspectives from caregiving research and digital mental health literature, this paper provides a conceptual overview of emerging opportunities and ethical challenges associated with the use of AI in caregiver-related contexts.

KEYWORDS: *Caregiver burden, Artificial intelligence, Caregiver assessment, Digital mental health, Ethical governance, Mental healthcare.*

INTRODUCTION

Caregiver burden is becoming a major public health concern especially in the context of long-term care of people with chronic medical conditions, disabilities and mental health disorders. Informal caregivers are usually family members, offer important emotional, physical and practical support. Many studies indicate that family members play an essential role in providing long-term support for their loved ones or family members who are not able to carry out daily activities on their own. However, family caregivers often experience significant burden due to the increasing demands of caregiving (Liu et al., 2020). The constant demands of caregiving can lead to significant psychological distress, physical strain, social isolation and financial problems. This combination of stressors is associated with increased risk for depression and anxiety, decreased quality of life and worsening of physical health problems for caregivers. (Schulz & Sherwood, 2008).

The early studies of caregiver burden have been vital in shedding light on the complexity of the issue, ranging from psychological, social, to physical problems associated with caregiving (Lu et al., 2009). With the increasing age among the global population as well as their increasing number suffering from chronic diseases, there has been increased emphasis on the importance of recognizing caregiver burden within the healthcare system and in medical practice. The World Health Organization has recognized the increasing necessity to establish a supportive system that would focus on taking care of not only the patient but also the person providing care. Taking into account caregiving as one of the key elements in dealing with chronic illnesses within the public health system is another indication of the significance of addressing caregiver burden. Despite the increasing emphasis placed on the issues faced by caregivers, various factors such as insufficient psychological support, stigmatization, lack of time, and unavailability of caregiver stress screening still make it difficult for caregivers to receive necessary assistance.

In the last few years, there has been a growing trend that has seen the emergence of AI as a transformational aid in the healthcare industry. AI technology presents itself as an innovative choice when it comes to the evaluation, monitoring, and delivery of mental health assistance. The utilization of AI technology, such as machine learning, online testing and screening, and chatbots, is becoming increasingly popular in mental health services. (Torous et al., 2021; Wang et al., 2024).

As seen from the growing field of digital mental health, it could be inferred that there is a need for AI tools to aid in the transport of services, particularly when there is a deficiency in conventional means(Luxton, 2016). For example, in countries like Italy, which experience an aging population and shortage of carers, applications such as the guardian ecosystem utilize robots and mobile applications in order to improve the quality of life among the elderly by interacting with robots (Borna et al., 2024).

In regards to caregiving, AI can be used to detect caregiver burnout at an early stage, track caregiver well-being through monitoring, offer psychoeducation, and facilitate accessibility to services (Wang et al., 2024). But the introduction of AI in caregiving services brings up several clinical and ethical concerns that should not be overlooked. Issues of data privacy, consent, clinical validity, algorithmic

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bias, and the therapeutic relationship must be considered. The global ethical guidelines call for transparency and human involvement in the use of AI in the context of clinical practice (Ethics and Governance of Artificial Intelligence for Health : WHO Guidance, 2021).

In considering the connection between digital innovations and mental health, it is essential to explore the role of AI in the evaluation and management of caregiver burden in relation to any threats posed by the application (Saeidnia et al., 2024). The purpose of this paper will be to evaluate the use of artificial intelligence in the context of managing caregiver burden. It will also examine the implications and ethical concerns associated with the application of AI in clinical settings. In bringing together perspectives from the field of caregiving and digital mental health, this paper will attempt to lay a foundation for future studies on the topic.

As the link between digital innovation and mental health care, we need to look at how AI can aid in understanding and tackling caregiver burden while taking into account potential risks and ethical consideration. This paper intends to explore the function of artificial intelligence in evaluating and managing caregiver burden. Additionally, it will address emerging opportunities and ethical dilemmas associated with its implementation in clinical settings. By integrating perspectives from caregiving research and digital mental health literature, this paper seeks to establish a framework that can promote future research and the ethical application of AI in supporting caregivers.

Conceptualizing Caregiver Burden

Caregiver burden if often viewed as a complicated issue that includes emotional, physical, social, and financial stress this affects those who provide long-term care. The concept highlights the overall strain of caregiving, especially when caregivers support individuals with chronic illness, disabilities or mental health issue(Collins & Swartz, 2011; Lu et al., 2009).Caregiver burden has been seen into two dimensions: objective burden and subjective burden. Objective burden refers financial stress, challenges at work, and less social interaction. On the other hand, subjective burden refers emotional and psychological reactions to caregiving. It can include stress, guilt, frustration, anger (Chadda, 2014; Muñoz-Cruz et al., 2024). Machine learning helps caregivers who are feeling overwhelmed by offering a decision support system that directs them to the most suitable next actions in providing care(Borna et al., 2024).

Artificial Intelligence in Mental Health Care

Artificial intelligence is becoming more prevalent in healthcare system, providing novel methods for assessing and supporting mental health. Technologies like machine learning algorithms, digital phenotyping, natural language processing, and conversational agents are utilized to identify psychological distress, track behavioural trends, and deliver tailored assistance(Torous et al., 2021). These tools may help to improve the early detection of mental health issues, enhance access to services, and clinicians in their decision-making processes. The expanding area of digital mental health show case the potential of AI to enhance conventional care by facilitating remote monitoring, analysing data in real-time, and providing interventions(Luxton, 2016).

Evidence suggests that chatbots are valuable and effective tools for promoting mental health and also helps to deal with chronic illnesses. Randomized trials have shown that chatbots are helps to reduce symptoms of anxiety, depression, and stress (Shankar et al., 2025). Artificial intelligence aids in mental health support, improves decision-making processes, and alleviates pressures to enhance the quality of life of caregivers. This all-encompassing method allows us to precisely outline the various functions that Artificial intelligence serves in caregiving settings (Borna et al., 2024). Chatbots provide a conversational experience similar to speaking with a human, despite being driven by automated software. Studies suggest that having human support while using apps provides the best boost to engagement(Torous et al., 2021).

Role of Artificial Intelligence in Assessing and Supporting Caregiver Burden

There has been an increasing focus on the application of artificial intelligence technologies in the healthcare sector in recent times. These technologies assist healthcare providers and patients facing health challenges, facilitating more efficient care delivery. They have potential to enhance the effectiveness of healthcare operations while also linking healthcare with personal health management. This integration enables allows sharing information between both areas (Auf et al., n.d.). Chatbots are applications powered by artificial intelligence that interacts in a conversation similarly to human interaction, understanding inquiries and providing suitable responses. Digital technologies, especially chatbots, offers a valuable opportunity to address gaps in caregiver support (Shankar et al., 2025).

A constant challenge in developing chatbots is the attempt to offer emotional support through unfeeling computer code. Research indicates that people can build therapeutic relationships with digital tools this is a phenomenon called “digital therapeutic alliance” (Torous et al., 2021). In recent times, interventions driven by technology have emerged as effective solution to assist caregivers. E- learning systems, mobile apps, remote monitoring, and augmented reality present innovative approaches that deliver information, education, and continuous personal assistance. Research indicates that these technology-driven interventions can significantly alleviate caregiver burden and stress (Lumini et al., 2025).

Ethical challenges of Artificial Intelligence in Caregiver Support

Integrating artificial intelligence into mental health support presents numerous benefits, but it also raises significant ethical dilemmas. Issues surrounding data privacy and confidentiality are particularly important given the sensitive nature of mental health information. Upholding trust requires ensuring informed consent and providing clear information about how data will be utilized (Saeidnia et al., 2024). Algorithmic bias can lead to unfair or incorrect assessments, particularly among different cultural and socioeconomic groups. Additionally, an excessive dependence on automated systems might reduce the amount of human interaction. Thus, it is important to tackle these ethical issues to ensure responsible and fair use of artificial intelligence (Ethics and

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Governance of Artificial Intelligence for Health: WHO Guidance, 2021; Qasim El-Mashharawi et al., 2024).

The incorporation of artificial intelligence into mental health services gives considerable potential to improve care quality and lower healthcare expenses. Existing studies often focus on the effectiveness or ethical concerns of specific applications; however, limited attention has been given to the broader implications of incorporating artificial intelligence across the mental health care system furthermore, these technologies may play an important role in improving access to mental health services for underserved populations and enhancing life opportunities for individuals at risk (Fiske et al., 2019). Concerns like data protection, biased algorithms, and how automation affects the relationship between patients and healthcare professionals are essential factors that need to be examined to guarantee the ethical and responsible use of artificial intelligence interventions in mental health environments (Saeidnia et al., 2024).

THEORETICAL FRAMEWORK

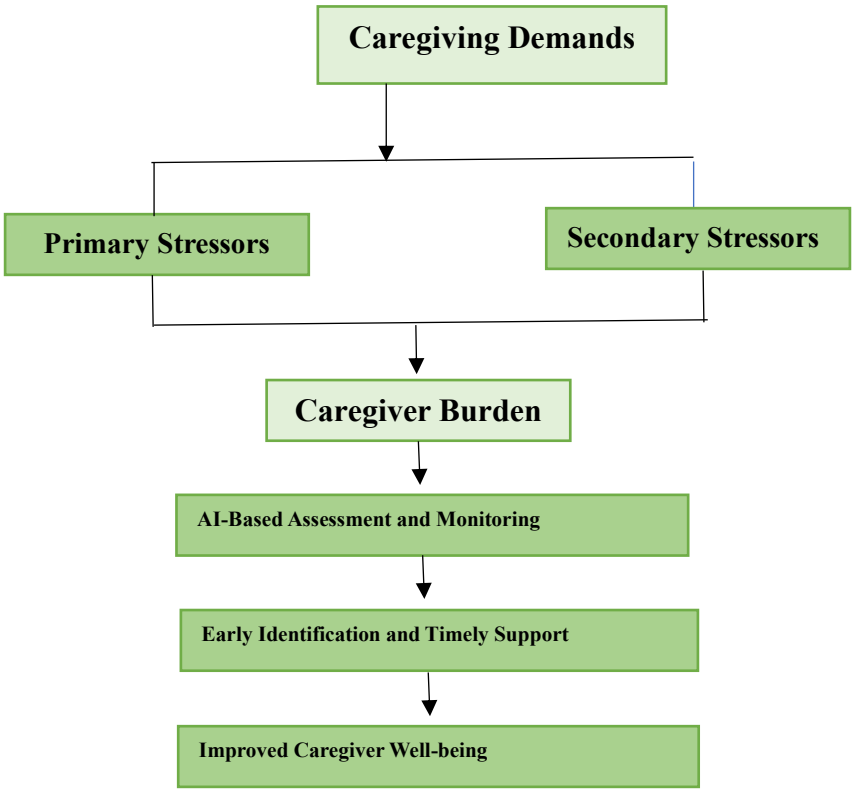
The present review is conceptually grounded in established theories from caregiving research and technology adoption. These theoretical perspectives provide a structured understanding of caregiver burden while also explaining the potential role of artificial intelligence (AI) in supporting caregiver assessment and management. The integration of caregiving theories with technology adoption theory offers a comprehensive conceptual foundation for examining both the psychological experiences of caregivers and the opportunities and challenges associated with AI-based healthcare technologies.

1. Stress Process Model

The Stress Process Model, proposed by Leonard Pearlin it is one of the most influential theoretical frameworks for understanding caregiver burden. The model explains that caregiver burden develops through a dynamic interaction between primary stressors, such as the demands of providing continuous care, and secondary stressors, including emotional strain, financial difficulties, social role conflicts, and reduced quality of life. The model further suggests that the impact of these stressors is influenced by coping resources, social support, and personal resilience.

Within the context of the present review, AI-driven screening systems, predictive analytics, and digital monitoring tools may assist in identifying caregiver stress at an early stage, allowing healthcare professionals to recognize individuals who may require additional psychological or social support. Thus, AI may complement existing caregiving practices by facilitating timely identification of caregiver burden while maintaining the importance of human-centred clinical care.

Stress Process Model



2. Transactional Model of Stress and Coping

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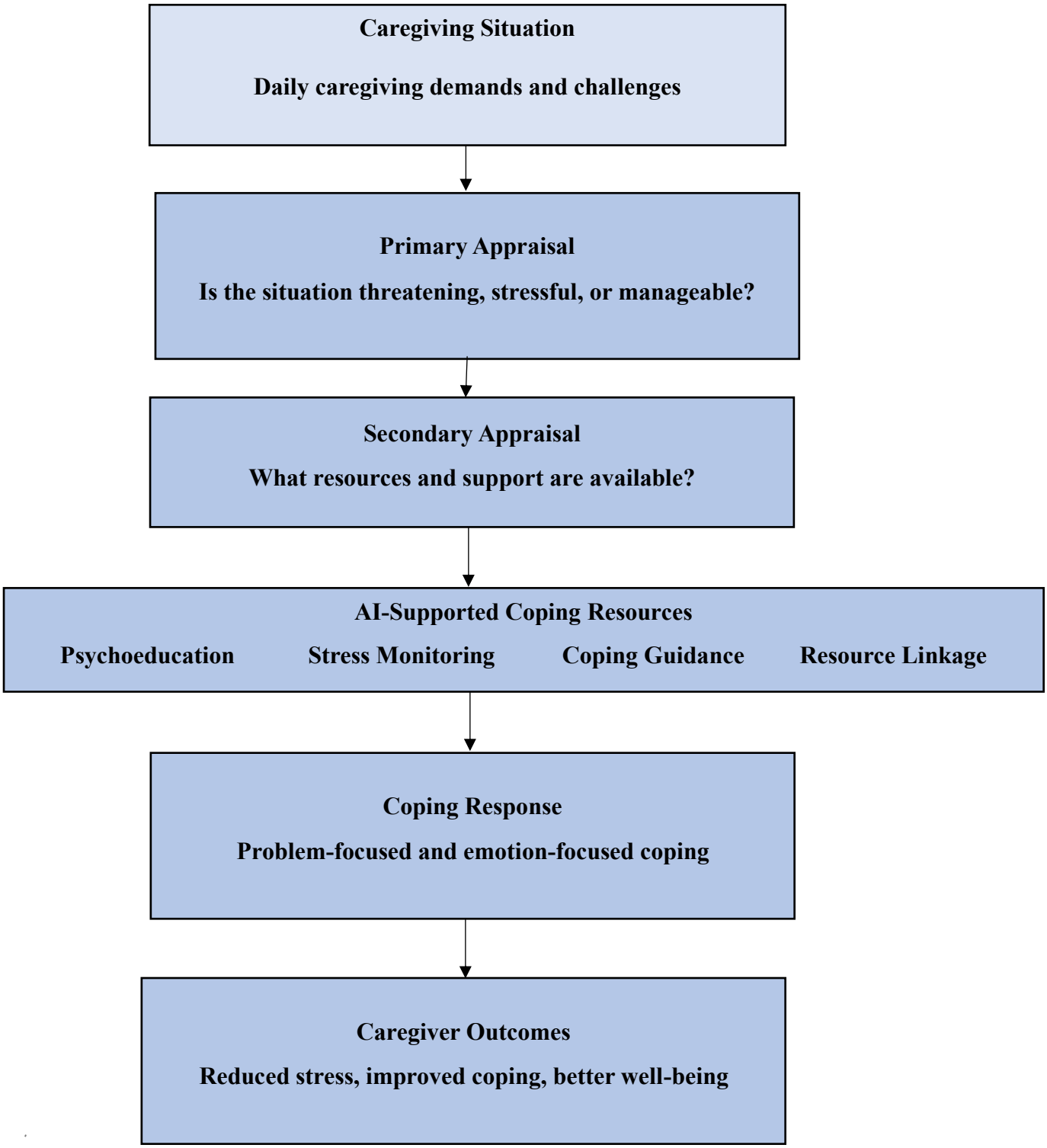
The Transactional Model of Stress and Coping, developed by Lazarus and Folkman (1984), proposes that psychological stress is determined not only by external events but also by an individual's cognitive appraisal of those events and the coping strategies used to manage them. According to this model, caregivers experiencing similar caregiving responsibilities may report different levels of burden depending on how they perceive caregiving demands and the resources available to cope with those demands (Folkman, 2013).

This perspective is particularly relevant to the present review because AI technologies have the potential to support continuous monitoring of caregiver well-being and facilitate the early identification of psychological distress. AI-assisted assessment tools may contribute to recognizing changes in caregivers' emotional and psychological functioning, thereby supporting timely referrals and appropriate interventions. However, these technologies should be viewed as complementary to professional judgement rather than as replacements for human clinical decision-making.



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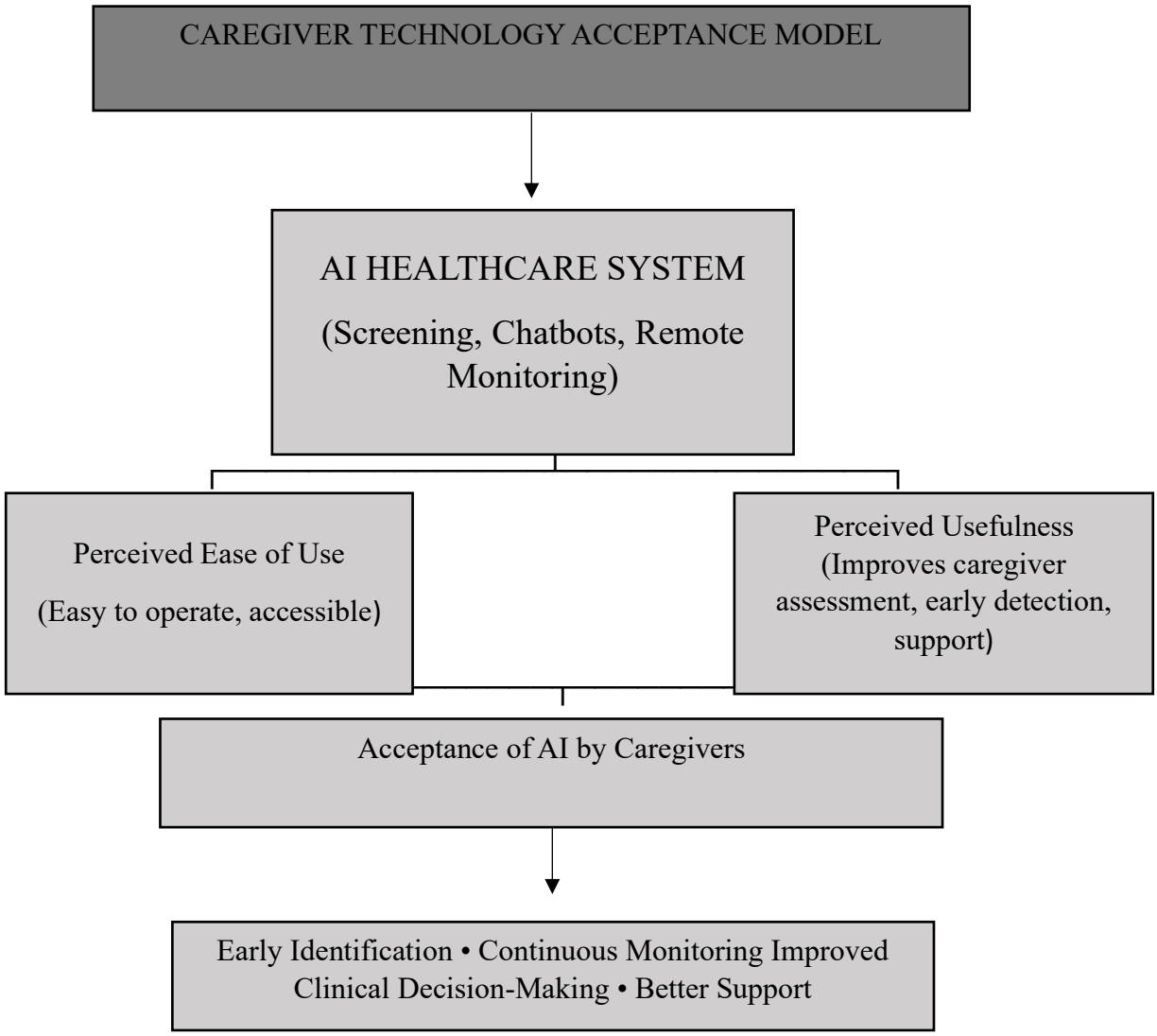
3. Technology Acceptance Model

The Technology Acceptance Model (TAM), proposed by Davis (1989), explains the factors that influence individuals' willingness to adopt and use new technologies. According to the model, two primary determinants influence technology acceptance: perceived usefulness, referring to the belief that a technology enhances performance or outcomes, and perceived ease of use, referring to the belief that the technology is simple and convenient to use (Davis, 1993). Within caregiver support and mental healthcare, TAM provides a useful framework for understanding the acceptance of AI-based applications, including digital screening systems, chatbot-assisted support, predictive analytics, and remote monitoring technologies. The successful implementation of AI in caregiver assessment depends not only on technological capabilities but also on caregivers' and healthcare professionals' perceptions of its usefulness, usability, trustworthiness, and ethical acceptability. Consequently, the application of AI should emphasize transparency, user-centred design, privacy protection, and clinical reliability to encourage responsible adoption.



Integration of the Theoretical Framework

Collectively, these theoretical perspectives provide a comprehensive conceptual basis for the present review. The Stress Process Model explains the development of caregiver burden, the Transactional Model of Stress and Coping illustrate how caregivers perceive and respond to caregiving-related stress, and the Technology Acceptance Model explains the factors that may influence the adoption of AI-based technologies in caregiver assessment and management. The integration of these theories supports the central argument of this review that AI has the potential to enhance caregiver assessment and support while ethical principles, professional oversight, and human-centred care remain essential for its responsible application.

OBJECTIVES OF THE STUDY

1. To explore the role of artificial intelligence in the assessment and management of caregiver burden.
2. To examine the potential applications of AI technologies in identifying, monitoring, and supporting caregivers.
3. To critically analyse the ethical challenges associated with the use of AI in caregiver support.

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4. To integrate existing literature on caregiver burden and digital mental health to provide a conceptual understanding of this emerging field.
5. To identify emerging opportunities, existing challenges, and future research directions regarding the application of artificial intelligence in caregiver burden.

METHODOLOGY

This paper adopts a narrative review approach to examine the emerging role of artificial intelligence in the assessment and management of caregiver burden. A narrative review was considered appropriate because it allows for the integration and critical discussion of evidence from diverse sources, providing a comprehensive conceptual understanding of an emerging interdisciplinary topic. Unlike a systematic review, the objective of this paper was not to quantitatively synthesize findings but to critically examine existing literature and discuss the opportunities, challenges, and ethical considerations associated with AI in caregiver support.

LITERATURE SEARCH STRATEGY

A comprehensive literature search was conducted using electronic databases, including Google Scholar, PubMed, Scopus, ScienceDirect, PsycINFO, and Web of Science. Searches were performed using combinations of keywords such as *caregiver burden*, *informal caregivers*, *artificial intelligence*, *digital mental health*, *machine learning*, *predictive analytics*, *chatbots*, *mental health technologies*, and *ethical challenges*. Additional relevant publications were identified by examining the reference lists of selected articles to ensure broader coverage of the topic.

Literature Synthesis

The reviewed literature consistently demonstrates that caregiver burden is a multidimensional phenomenon encompassing emotional, physical, social, and financial challenges experienced by individuals providing long-term care. Earlier studies have established that caregiving responsibilities often contribute to psychological distress, reduced quality of life, social isolation, and physical exhaustion, highlighting caregiver burden as a significant public health and mental health concern(Collins & Swartz, 2011; Lu et al., 2009; Schulz & Sherwood, 2008). More recent evidence further emphasizes that caregiver burden should be understood as both an objective and subjective experience, influenced by caregiving demands as well as caregivers' emotional responses to those demands (Chadda, 2014; Muñoz-Cruz et al., 2024).

The literature also indicates a growing recognition of artificial intelligence as an emerging resource within mental healthcare. Across the reviewed studies, AI technologies including machine learning, predictive analytics, natural language processing, digital phenotyping, and conversational agents have demonstrated potential for improving the early identification of psychological distress, facilitating continuous monitoring, supporting clinical decision-making, and expanding access to mental health services (Luxton, 2016; Torous et al., 2021; Wang et al., 2024). These findings suggest that AI has the capacity to complement conventional mental healthcare by providing timely, data-driven support, particularly in settings where access to psychological services is limited.

Within caregiver-related contexts, the reviewed literature suggests that AI applications extend beyond symptom detection to include psychoeducation, remote monitoring, decision-support systems, chatbot-assisted communication, and technology-enabled caregiver support. Studies examining digital interventions indicate that these technologies may reduce caregiver stress, improve care coordination, and facilitate access to information and emotional support (Borna et al., 2024; Lumini et al., 2025; Shankar et al., 2025). The concept of a digital therapeutic alliance further highlights that meaningful engagement between users and AI-supported platforms may enhance the effectiveness of technology-assisted mental health care when combined with appropriate human involvement (Torous et al., 2021).

Despite these promising developments, the literature consistently emphasizes that the application of AI in caregiver support must be accompanied by careful ethical consideration. Common concerns identified across the reviewed studies include data privacy, informed consent, algorithmic bias, transparency, clinical validity, accountability, and the preservation of therapeutic relationships(*Ethics and Governance of Artificial Intelligence for Health : WHO Guidance*, 2021; Fiske et al., 2019; Qasim El-Mashharawi et al., 2024). These findings collectively indicate that technological innovation alone is insufficient and that ethical governance and human oversight remain fundamental to the responsible integration of AI into mental healthcare.

Overall, the reviewed literature demonstrates strong evidence regarding caregiver burden and the expanding applications of artificial intelligence within healthcare. However, relatively few studies have directly examined the integration of these two fields. Existing research has primarily focused either on caregiver burden or on AI-based mental health applications, with limited attention given to how AI can specifically contribute to the assessment and management of caregiver burden. By bringing together evidence from caregiving research, digital mental health, and AI ethics, the present review provides a conceptual synthesis that highlights current knowledge, identifies existing gaps, and offers an integrated perspective on the emerging role of artificial intelligence in caregiver support.

Ethical Framework

The ethical application of artificial intelligence (AI) in the assessment and management of caregiver burden requires a structured framework that ensures technological innovation is implemented responsibly while protecting the rights and well-being of caregivers. Based on the literature reviewed, the ethical framework adopted in the present paper is informed by the World Health Organization's Ethics and Governance of Artificial Intelligence for Health, together with the ethical considerations discussed by Fiske, Saeidnia, and Qasim El-Mashharawi. These sources collectively emphasize that AI should function as a supportive clinical tool rather than a replacement for professional judgement and human-centred care.

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Respect for Privacy and Confidentiality

AI-based systems used in caregiver assessment frequently collect sensitive psychological, behavioural, and health-related information. The reviewed literature consistently emphasizes that the protection of personal data is fundamental to the ethical use of AI. Appropriate safeguards, secure data management, and confidentiality measures are essential to maintain caregivers' trust and protect their privacy(Fiske et al., 2019).

Informed Consent and Autonomy

The literature further highlights that caregivers should be fully informed regarding the purpose, scope, and potential limitations of AI-based assessment tools before their information is collected or analysed. Respecting individual autonomy requires that caregivers understand how AI systems operate, how their data will be used, and that participation remains voluntary. Transparent communication strengthens trust and supports ethical decision-making.

Fairness and Algorithmic Bias

Several authors have raised concerns regarding algorithmic bias arising from unrepresentative datasets or biased computational models. Such bias may result in inaccurate assessment outcomes or unequal access to support for particular groups of caregivers. Consequently, AI systems should be developed and evaluated using diverse and representative data while ensuring fairness, equity, and transparency throughout the assessment process (Fiske et al., 2019; Qasim El-Mashharawi et al., 2024).

Transparency, Accountability, and Human Oversight

The reviewed literature consistently argues that AI systems should be transparent, explainable, and subject to appropriate professional oversight. Healthcare professionals remain responsible for interpreting AI-generated outputs and integrating them with clinical judgement. AI should therefore be regarded as a decision-support technology that complements, rather than replaces, human expertise and therapeutic relationships (Ethics and Governance of Artificial Intelligence for Health : WHO Guidance, 2021; Saeidnia et al., 2024).

Beneficence and non-maleficence

The ethical implementation of AI should promote caregivers' well-being while minimizing potential harm. AI technologies should contribute to the early identification of caregiver burden, facilitate timely support, and improve access to mental healthcare without increasing psychological distress, discrimination, or dependence on automated decision-making. Continuous evaluation of AI systems is therefore essential to ensure that their benefits outweigh potential risks (WHO, 2021; Fiske et al., 2019).

Ethical Integration of AI in Caregiver Support

Collectively, the reviewed literature suggests that the responsible application of AI in caregiver assessment should be guided by the principles of privacy, autonomy, fairness, transparency, accountability, beneficence, and human oversight. These ethical principles provide a conceptual foundation for balancing technological innovation with compassionate, person-centred care, ensuring that AI enhances rather than diminishes the quality of caregiver support.

Practical Implications

The findings of the present review have several practical implications for clinical psychology, mental healthcare, and caregiver support services. As caregiver burden is frequently associated with emotional distress, physical exhaustion, and reduced quality of life, the integration of artificial intelligence (AI) into caregiver assessment has the potential to complement existing healthcare practices by facilitating the early identification of caregivers who may be at risk of significant burden (Schulz & Sherwood, 2008; Wang et al., 2024).

AI-based screening systems and predictive analytics may assist healthcare professionals in identifying changes in caregivers' psychological well-being through continuous monitoring of behavioural and emotional indicators. Such technologies have the potential to support early recognition of caregiver distress, allowing timely referral to appropriate mental health services while complementing, rather than replacing, professional clinical judgement (Luxton, 2016; Torous et al., 2021).

The reviewed literature also highlights the potential value of AI-enabled digital platforms, including chatbot-assisted psychoeducation, remote monitoring systems, and decision-support technologies, in improving caregivers' access to information and support. These technologies may be particularly beneficial for caregivers who experience barriers to accessing conventional mental health services due to time constraints, geographical limitations, or caregiving responsibilities (Borna et al., 2024; Wang et al., 2024).

From a clinical perspective, AI should be integrated as a supportive tool within multidisciplinary healthcare settings. Mental health professionals should interpret AI-generated information alongside comprehensive clinical assessment to ensure that decisions remain individualized and contextually appropriate. The practical implementation of AI in caregiver assessment should also be guided by ethical principles, including privacy protection, informed consent, transparency, fairness, and human oversight. Adherence to these principles will be essential for promoting trust, ensuring responsible use of AI technologies, and safeguarding caregivers' rights throughout the assessment and support process. (Qasim El-Mashharawi et al., 2024)The reviewed literature consistently emphasizes that AI is intended to augment professional expertise rather than replace therapeutic relationships or clinical decision-making (*Ethics and Governance of Artificial Intelligence for Health : WHO Guidance*, 2021; Fiske et al., 2019; Qasim El-Mashharawi et al., 2024; Saeidnia et al., 2024).

Overall, the literature suggests that the responsible integration of AI into caregiver assessment and support has the potential to strengthen existing mental healthcare services by enhancing early detection, facilitating continuous monitoring, improving accessibility, and supporting informed clinical decision-making. However, these technologies should always be implemented within ethically governed and human-centred models of care to ensure that technological innovation complements, rather than compromises, the quality of caregiver support.

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Future Directions

The rapid advancement of artificial intelligence (AI) presents significant opportunities for improving the assessment and management of caregiver burden. However, the existing literature indicates that this field remains in its early stages and requires further conceptual, empirical, and clinical development. Future research should therefore focus on strengthening the scientific evidence supporting AI-assisted caregiver assessment while ensuring that technological innovations remain ethically responsible and clinically meaningful.

One important direction for future research is the development and validation of AI-based assessment tools specifically designed to identify caregiver burden. Although recent studies have demonstrated the potential of AI technologies for psychological assessment and digital mental healthcare, relatively few investigations have focused exclusively on caregivers. Future studies should evaluate the reliability, validity, sensitivity, and clinical utility of AI-assisted screening systems across diverse caregiving populations and healthcare settings (Luxton, 2016; Torous et al., 2021; Wang et al., 2024).

Future research should also prioritize longitudinal investigations examining changes in caregiver burden over time. Caregiving is a dynamic process in which emotional, physical, social, and financial demands evolve according to disease progression and caregiving responsibilities. Longitudinal studies may provide greater insight into how AI can continuously monitor caregiver well-being, identify early warning signs of psychological distress, and facilitate timely support throughout different stages of caregiving (Muñoz-Cruz et al., 2024; Schulz & Sherwood, 2008).

The reviewed literature further indicates the need for interdisciplinary collaboration in the design and implementation of AI-based caregiver support systems. Future developments should involve psychologists, psychiatrists, healthcare professionals, computer scientists, AI developers, ethicists, and caregivers themselves to ensure that technological innovations are clinically relevant, user-centred, culturally appropriate, and responsive to caregivers' real-world needs (Borna et al., 2024; Lumini et al., 2025).

Ethical governance should remain a central priority in future AI research. Although AI offers considerable potential for improving caregiver assessment, concerns regarding data privacy, informed consent, algorithmic bias, transparency, accountability, and equitable access continue to require careful attention. Future investigations should therefore focus not only on improving technological performance but also on developing ethical governance frameworks that promote fairness, explainability, and responsible implementation of AI within mental healthcare settings (Ethics and Governance of Artificial Intelligence for Health: WHO Guidance, 2021; Fiske et al., 2019; Qasim El-Mashharawi et al., 2024; Saeidnia et al., 2024).

Finally, future research should move beyond demonstrating the technical capabilities of AI and examine its practical integration within routine caregiver support services. Greater emphasis should be placed on evaluating how AI can complement existing mental healthcare systems, strengthen early identification of caregiver burden, improve accessibility to psychological support, and enhance clinical decision-making without compromising therapeutic relationships or person-centred care. As digital mental healthcare continues to evolve, integrating technological innovation with established caregiving research will be essential for developing effective, ethical, and sustainable approaches to caregiver assessment and support (Shankar et al., 2025; Torous et al., 2021; Wang et al., 2024).

Overall, the future of AI in caregiver burden research depends upon the generation of robust empirical evidence, interdisciplinary collaboration, ethical governance, and the responsible translation of technological advances into clinical practice. Addressing these priorities will contribute to a more comprehensive understanding of caregiver burden while supporting the development of AI-assisted approaches that enhance, rather than replace, human-centred mental healthcare.

Limitations

The present paper should be interpreted in light of several limitations. First, this study is a conceptual narrative review that synthesizes existing literature rather than presenting original empirical findings. Consequently, the conclusions are dependent upon the quality, scope, and methodological approaches of the studies included in the review and should not be interpreted as direct evidence of the effectiveness of artificial intelligence (AI) in reducing caregiver burden.

Second, the literature examining AI specifically within the context of caregiver burden remains limited. While substantial research exists on caregiver burden and, separately, on AI applications in healthcare and mental health, relatively few studies have directly investigated the integration of these two domains. As a result, several conclusions presented in this review are based on the conceptual integration of findings from related areas rather than on a large body of caregiver-specific AI research (Luxton, 2016; Wang et al., 2024).

Third, AI technologies continue to evolve rapidly, and many of the reviewed studies represent emerging developments rather than well-established clinical practices. Consequently, future technological advances, regulatory changes, and additional empirical evidence may influence the applicability of the conclusions discussed in this review(Lumini et al., 2025; Saeidnia et al., 2024).

Another limitation relates to the diversity of caregiving contexts represented in the literature. Caregiver burden varies according to the nature of the illness, caregiving responsibilities, cultural background, healthcare systems, and available social support. Although previous studies have demonstrated the multidimensional nature of caregiver burden, the findings reviewed in this paper may not be equally applicable across all caregiving populations or clinical settings (Chadda, 2014; Collins & Swartz, 2011; Liu et al., 2020; Muñoz-Cruz et al., 2024).

Furthermore, this review primarily discusses the potential applications of AI from a conceptual perspective and does not evaluate the clinical effectiveness, diagnostic accuracy, cost-effectiveness, or long-term outcomes of individual AI-based interventions. Such evaluations require rigorous empirical research, including longitudinal studies and controlled clinical investigations (Borna et al., 2024; Shankar et al., 2025).

Finally, although ethical issues such as privacy, informed consent, algorithmic bias, transparency, and

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accountability have been discussed, the rapidly evolving regulatory landscape surrounding AI may introduce additional ethical and legal considerations beyond the scope of the present review. Continued research and international collaboration will therefore be necessary to ensure the responsible development and implementation of AI within caregiver assessment and support(*Ethics and Governance of Artificial Intelligence for Health : WHO Guidance*, 2021; Fiske et al., 2019).

Despite these limitations, the present review provides a comprehensive conceptual synthesis of the existing literature by integrating evidence on caregiver burden, artificial intelligence, and ethical considerations. It offers a foundation for future empirical investigations while highlighting the opportunities and challenges associated with the responsible application of AI in caregiver-related mental healthcare.

DISCUSSION

The present paper highlights the growing significance if artificial intelligence in identifying and addressing caregiver burden in both clinical and community settings. Caregiver burden is recognized as a complex challenge influenced by emotional, physical, social, and financial stresses (Schulz & Sherwood, 2008). Artificial intelligence technologies may improve collaboration between formal healthcare providers and informal caregivers, which could enhance telehealth support and continuity of health care. However, there is still limited research on assistive technologies like social robots and mobile health applications, showing the need for more exploration (Milella & Bandini, 2024). As healthcare system face rising demands from aging populations and more chronic health issues, there is a pressing need for innovative methods to provide support for mental health. In this context, artificial intelligence offers valuable chances to improve traditional support systems (Torous et al., 2021). Technologies improved by AI can improve care coordination and provide both information and emotional support to caregivers. Future studies should look into the different needs of informal caregivers and develop more targeted AI solutions for them (Borna et al., 2024; Wang et al., 2024). Digital and technology-driven solutions have demonstrated potential in alleviating the stress and burden experienced by caregivers. This is accomplished via psychoeducation, virtual support, and monitoring tools (Lumini et al., 2025).

As a growing use of automated systems raises questions about transparency, accountability, and the possible effects on therapeutic approach. Global guidelines highlight the importance of transparency, human oversight, and ethical governance when using AI in healthcare settings (Ethics and Governance of Artificial Intelligence for Health: WHO Guidance, 2021). Ethical evaluations highlight concerns like algorithmic bias, issues with transparency, and difficulties in assessing the clinical validity if AI tools, all of which could affect trust and equity in healthcare environment(lumke et al., 2019; Saeidnia et al., 2024). Overall, evidence shows that artificial intelligence is a promising yet developing field in caregiver support. Future studies should concentrate on assessing the efficiency, clinical relevance, and cultural sensitivity of artificial intelligence interventions for caregivers. It is essential for clinicians, researchers, and technology developers to guarantee that AI tools are created with ethical protections and user centered perspective.

CONCLUSION

Caregiver burden remains a significant psychological, social, and public health concern that affects the well-being of individuals providing long-term care for persons with chronic illnesses, disabilities, and mental health conditions (Chadda, 2014; Cham et al., 2022; Collins & Swartz, 2011; del-Pino-Casado et al., 2021; Liu et al., 2020; Morgan et al., 2022). As the demand for caregiving continues to increase, there is a growing need for innovative approaches that can complement existing caregiver assessment and support systems. The literature reviewed in the present paper suggests that artificial intelligence (AI) has emerged as a promising technological advancement with potential applications in the assessment, monitoring, and management of caregiver burden through digital screening, predictive analytics, remote monitoring, and AI-assisted support systems (Luxton, 2016; Torous et al., 2021; Wang et al., 2024).

At the same time, the findings of this review demonstrate that the successful integration of AI into caregiver support extends beyond technological innovation. Ethical considerations, including privacy, informed consent, algorithmic fairness, transparency, accountability, and human oversight, remain fundamental prerequisites for the responsible implementation of AI within mental healthcare (*Ethics and Governance of Artificial Intelligence for Health : WHO Guidance*, 2021; Fiske et al., 2019; Saeidnia et al., 2024). Consequently, AI should be regarded as a complementary decision-support tool that enhances, rather than replaces, professional clinical judgement and person-centred caregiving.

A key contribution of the present review is the integration of evidence from caregiver burden research, digital mental health, artificial intelligence, and healthcare ethics into a unified conceptual perspective. By synthesizing these interdisciplinary areas, the review highlights emerging opportunities for AI-assisted caregiver assessment while simultaneously emphasizing the ethical responsibilities that accompany technological innovation. In doing so, the paper addresses an emerging area of inquiry where existing literature remains relatively limited and fragmented.

Overall, the present review underscores that the future role of AI in caregiver support should be guided by scientific evidence, ethical governance, clinical validation, and interdisciplinary collaboration among researchers, clinicians, policymakers, and technology developers. Continued research is required to strengthen the empirical evidence base, evaluate AI applications across diverse caregiving contexts, and ensure that technological developments remain responsive to the real-world needs of caregivers. With responsible implementation and appropriate human oversight, AI has the potential to complement existing caregiver support services while contributing to more accessible, equitable, and person-centred mental healthcare.

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