Chapter 6
Empathetic Algorithms: Integrating Emotional Intelligence and AI in Chronic Pain Management for Older Adults

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ABSTRACT

This chapter explores how the fusion of Emotional Intelligence (EI), Artificial Intelligence (AI), and Integrative Medicine can redefine chronic pain care in older adults. Grounded in research, it addresses the biopsychosocial complexities of pain through a multidimensional lens of gerontological nursing. It examines how emotionally intelligent communication enhances AI-driven tools and supports integrative therapeutic models to improve outcomes, empathy, and dignity in older patients. The chapter presents person-centered interventions, such as AI-assisted pain assessment with emotional profiling, integrative therapies like mindfulness and acupuncture, and emotionally intelligent nursing training. It aligns with Sustainable Development Goals (SDG 3 – Good Health and Well-being, SDG 9 – Industry, Innovation and Infrastructure, and SDG 10 – Reduced Inequalities), offering scalable, ethical, and interdisciplinary strategies to transform pain care for ageing populations.

1. INTRODUCTION

Chronic pain in older adults is a significant public health challenge that often remains under-recognised and inadequately addressed. Older adults frequently deal with multiple co-morbidities, which contribute to the complexity of pain manage-

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ment in this population (Cravello et al., 2019). Statistics indicate that up to 70% of older adults experience chronic pain, affecting their quality of life and leading to increased healthcare costs (Ehde et al., 2019; Cravello et al., 2019). Chronic pain is defined as pain that persists beyond the normal healing period, typically longer than three months. It is not merely a symptom of an underlying disease but a condition that can lead to biopsychosocial consequences affecting the individual's physical, emotional, and social well-being (Treede et al., 2019; Watson et al., 2019). As the population continues to age, the implications of chronic pain are likely to escalate, necessitating a more focused approach to its management and understanding (Ehde et al., 2019; Reis da Silva, 2024a).

The rationale for addressing chronic pain in older adults extends beyond medical concerns; it embodies social and economic dimensions as well. Chronic pain can lead to substantial functional impairment, making routine activities difficult and increasing dependence on caregivers (Souza et al., 2019). This dependency affects the older adult and imposes emotional and physical strains on family members, fostering an intergenerational cycle of stress and health decline (Shipton et al., 2018). Furthermore, untreated chronic pain among older adults has been linked to adverse mental health outcomes, including depression and anxiety, which can exacerbate physical symptoms (Crofford, 2015; Gagliese et al., 2018).

In addition, healthcare systems are challenged by the rising costs associated with managing chronic pain and its comorbid conditions. The World Health Organization has identified chronic pain as a growing health crisis, necessitating efficient care strategies that align with public health policy (Gatchel, 2015). To reiterate, the significance of chronic pain in older adults highlights the need for an integrated approach that encompasses medical, psychological, and sociocultural factors to deliver comprehensive care (Treede et al., 2019; Sonis, 2024).

An interdisciplinary framework is needed to understand chronic pain through the lens of the biopsychosocial model. This model interconnects biological, psychological, and social components to provide a holistic perspective on pain management (Driscoll & Kerns, 2016). Biology informs us about pain mechanisms and the physiological state of the patient, including the role of comorbidities prevalent in older populations (Kusnanto et al., 2018). Psychological aspects encompass cognitive-behavioural factors that can influence pain perception and coping strategies, such as anxiety, depression, and strategies of resilience (Meints & Edwards, 2018). Lastly, social elements involve the broader context of the older individual's lives, including their socioeconomic status, community support, and overall health literacy (Luque-Suárez et al., 2019).

The interdisciplinary framework is particularly relevant as it forms a comprehensive approach that can guide clinicians in tailoring effective intervention strategies for chronic pain management in the older population (Henschke et al., 2016). By