

Emerging applications that solve health related challenges: a focus on medication adherence and pain assessment

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The number of digital health technologies has boomed lately and the field has considerably evolved in the last two decades.¹ It is recognized that these technologies are also becoming major drivers towards improved quality of healthcare.³ Digital health solutions have benefited from increased capabilities of more specific areas such as artificial intelligence (AI) whilst the type of AI can vary and is subject to ongoing innovations, most health-related interventions use a form of signal processing or machine learning.⁴ In terms of scope of application, these solutions address various health related problems in therapeutics, diagnostics, education and health promotion. Here we focus on two health-related challenges that can be assisted by use of digital health technologies and supported by artificial intelligence. Finding better ways of detecting and therefore improving medication adherence is one challenge that currently has a number of health consequences. Over half of people with chronic conditions are non-adherent to their medications and this results in increased hospitalizations, mortality and healthcare cost.^{5,6} Much of this non-adherence relates to issues with medication self-administration. In this regard, we used an AI-driven system to wirelessly detect and evaluate the technique of inhaler and insulin self-administration.⁶ Secondly, use of digital health technologies supported by AI can also be demonstrated in the area of pain assessment in people unable to communicate. Population groups such as infants and people living with advanced dementia are unable to self-report their pain.^{7,8} People with dementia often experience behavioural and psychological symptoms whilst the underlying cause of that may be undertreated or undetected pain. There are other multiple health related challenges that can be assisted by use of digital health solutions and continuous advancements in AI techniques will further facilitate development and clinical deployment of these solutions.

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