Guest editorial

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Applications of technology in mental health support: a multifaceted and rapidly expanding field of potential

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Abbreviations

AI = Artificial intelligence;

CBT = Cognitive–behavioural therapy;

DIMH = Digital innovations for mental health;

F2F = Face-to-face;

GPs = General practitioners; and

UK = United Kingdom.

Introduction

The purpose of this editorial is to introduce this special issue of Mental Health and Social Inclusion and provide an overview of the papers included. All the papers within this special edition share an interest in developing technologies to support people's mental health and emotional wellbeing. This editorial introduces the reader to the area of applications of technology for mental health and its value. A rapidly growing body of literature continues to emerge regarding technological applications to mental health support for both service providers and service users. This edition brings together some of the latest research into this area covering technologies such as artificial intelligence, computer games, chatbot services, tools for ecological momentary assessment, educational tools and the ethics of digital health care. Papers included in this issue were also presented at the 2023 edition of the International Conference for Advancements in Communication Technology and Computer Engineering (ICACTCE).

As the technological world and its reach grows at pace, so too does its influence in mental health care. As digital innovations become a more pervasive part of care provision, research into their reach, efficacy, implications and value grows ever more important. Within the selected papers, technological tools and interventions are considered in terms of their potential effects on mental health care and access to psychological intervention.

As is well documented, the global burden of mental health is significant and growing (Vigo *et al.*, 2022; Patel *et al.*, 2018). An array of scientifically validated treatment protocols exist for intervention across the range of psychiatric disorders and diagnoses; however, their efficacy can be blunted by numerous impediments to successful outcome. These may include social barriers such as actual or perceived stigma, practical complications regarding accessibility and availability of suitable treatment, and attrition, among others (Westberg *et al.*, 2022; Hamilton *et al.*, 2022) and have been exacerbated by the COVID-19 pandemic (Pierce *et al.*, 2021; Probst *et al.*, 2020; Czeisler *et al.*, 2020).

It is therefore perhaps unsurprising that health-care systems, clinicians and service-users have turned to alternative mediums for alleviating the above pressures. As the demand for mental health services is unlikely to be satisfied solely by face-to-face (F2F) care, and as

such provision is unlikely to reach all those in need, interest continues to grow in the benefits and potential applications of digital innovations for mental health (DIMH) (Torous *et al.*, 2021).

DIMH are multifaceted. While the term has often been associated merely with digitised versions of F2F clinical interventions (e.g. cCBT or online support groups), the term more broadly may include telephone-based counselling (Rowen *et al.*, 2022), serious and therapeutic games (Barnes and Prescott, 2022; Maurin *et al.*, 2020), exposures and interventions using virtual and augmented reality (Freeman *et al.*, 2022; Almurashi *et al.*, 2022), ecological momentary assessment tools with the capacity for outpatient monitoring packages (Verhagen *et al.*, 2022; Schwartz *et al.*, 2016), early-intervention and deep-learning (Kim *et al.*, 2020; Reece and Danforth, 2017) predictive tools, and chatbots and artificial intelligence (AI)-powered systems (Pham *et al.*, 2022), among others. Consequently, DIMH ought not to be viewed simply as a derivative of traditional health care – the cyberspace cousin of *in vivo* treatment, but in some respects an extension of it. In some instances, DIMH offer the potential to expand the reach of health-care systems and processes into previously unexplorable areas and cohorts.

Traditional treatments, while effective, are beset by barriers associated with their delivery. Treatment-seeking, often the first step in the therapeutic process for individuals not directly referred by general practitioners or other services, can be compromised by issues related to perceived stigma, treatment costs and poor expectations of outcome (Wuthrich and Frei, 2015). For those seeking treatment, problems such as long waiting lists, practical difficulties in accessing appropriate intervention and lack of social support can lead to non-attendance and drop-out (Sweetman *et al.*, 2021). Following intervention, numerous ongoing factors such as symptom residuality mean that, despite successful outcome at the conclusion of a treatment programme, some conditions demonstrate high levels of relapse (Lorimer *et al.*, 2020). DIMH, in part due to their accessible mode of delivery and discreet asynchronicity, show promise in helping to alleviate some of the barriers to treatment associated with F2F intervention, for example in expanding reach, reducing stigma, reducing reliance on client ability to travel, reducing clinician workloads and affording opportunities for social support (Carswell *et al.*, 2018; Torous *et al.*, 2020; Richards *et al.*, 2018).

While there is potential for DIMH however to come to represent a new conceptualisation of psychological health care in light advances in technology, such advances necessitate (and will continue to require) appropriate scientific scrutiny, with user-involvement, to assess their suitability, acceptability, use, and ultimately efficacy (Barnes *et al.*, 2022; Barnes and Prescott, 2022; Torous *et al.*, 2019).

In this special issue, authors address a number of areas of digital mental health care, from initial evaluations of novel interventions, to protocols for ongoing research, and discussion of the empirical, ethical and practical challenges facing work in this fast-moving area of interest. The original research papers included in this special edition include innovative research on therapeutic computer games as well as AI. Indeed, the paper by us, the editors, of this special edition (Barnes and Prescott) addresses the successful initial evaluation of a mobile therapeutic game designed to reduce symptoms of anxiety in adolescents, building on previous work with prospective users to assist its conceptualisation and development (Barnes and Prescott, 2022).

Approaching gamification from an educational standpoint, Conn *et al.* present the development and findings of an initial evaluation of a gamified tool for developing risk-assessment skills in trainee counsellors in the UK. Examining perceptions of AI in the therapeutic process, Prescott and Hanley present findings from an assessment of practicing and trainee therapist attitudes towards machine therapy, finding that while reservations exist, participants demonstrate openness to the potential of AI. In a similar vein, Ogilvie and Prescott present the implementation, design, and user-evaluation of a chatbot-based tool for positive recovery in addiction. Also considering psychological interventions in the context of health conditions with significant physical implications, Adeel *et al.* examine applications of technology for mental health interventions for people with diabetes.

In this edition, we also present a handful of study protocols as a glimpse into the early stages and planned analysis of future digital innovations. One such paper concerns a pilot evaluation of a gamified intervention developed during COVID-19 in collaboration with a mental health charity in Bolton, UK (Barnes *et al.*, 2022), designed as a means of delivering educational and therapeutic content to adults to improve wellbeing. Showcasing the potential for the deployment of ecological momentary assessment strategies, Kornacka *et al.* present a protocol concerning the development of a mobile application to aid cognitive–behavioural therapy practitioners in developing a dynamic network in case conceptualisation.

Finally, we present a discussion paper concerning ethical and practical considerations regarding the design, evaluation and implementation of serious games. This special edition therefore represents an extensive, if by no means complete insight into some of the latest work in the area of DIMH. The field of digital health is expanding rapidly, and as the drive for applications of technology to mental health becomes more pervasive, it becomes ever more important to ensure that their potential is fulfilled in a way that enshrines effective evaluation, clinician and user trust, and overcoming barriers to treatment at its heart. Many of the papers are UK based but with a wider international audience in mind as digital innovations have broad applications.

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