Chapter 9
Smart and Digital Wellbeing Initiatives in Healthcare: The Way Forward

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ABSTRACT

Smart and digital wellbeing initiatives play a significant role in modern healthcare. This chapter explores current initiatives, their use and effectiveness, as well as their challenges and future directions, with a special focus on mental health. It explores

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digital wellbeing, the growing need for initiatives, and the tools available in India and the world. These initiatives enhance accessibility, reduce stigma, offer personalized interventions, and improve psychological and workplace wellbeing. However, current technology, especially AI-based chatbots, have limited user interaction and authentic therapeutic support. Additionally, biased datasets can lead to flawed responses and issues with inclusive support. Current initiatives face privacy concerns due to a lack of regulatory bodies, emphasizing the need for robust regulation and oversight. Collaborative development, appropriate marketing and improved security are key to improving existing initiatives. Future research needs to address and explore these concerns to ensure the development of effective and ethical initiatives.

INTRODUCTION

Digital Wellbeing in the 21st Century

The term *'digital wellbeing'* refers to the impact of digital technology on human lives within an informational society (Floridi, 2014). It encompasses the ability to use digital tools effectively and responsibly while minimising potential harm, such as digital fatigue, technology addiction, and declining attention spans (Vanden Abeele, 2021). With the increasing presence of digital devices in personal and professional spaces, ensuring healthy engagement with technology has become an essential goal for individuals, workplaces, and policymakers. The widespread adoption of digital technologies has reshaped interactions with oneself, others, and society at large. Consequently, individual and societal wellbeing are now closely linked to the quality of the digital environment and the tools that shape interactions (Floridi, 2014). 'Wellbeing' in recent times has come to be used in an all-encompassing manner, referring to positive health and fulfillment in all sectors of life, whether psychological, physical or social, rather than just being happy (Ruggeri et al., 2020).

In the 21st century, technology has transformed nearly every aspect of human life. Digital wellbeing is particularly crucial in today's hybrid work and learning environments, where remote interactions and digital collaboration have become the norm. The rapid expansion of digital tools, artificial intelligence, and online platforms has led to unparalleled convenience and efficiency (Twenge & Campbell, 2018). As such, utilising these tools and technology to further promote wellbeing is the fundamental basis behind digital wellbeing ventures. As digital tools become increasingly embedded in daily life, their impact on mental and emotional health has gained attention, leading to the development of digital wellbeing initiatives aimed at ensuring that technology use remains balanced, enriching, and aligned with and fostering human needs (Burr et al., 2020).

Technological advancements have improved access to education, healthcare, and economic opportunities. Online learning platforms, telemedicine services, and AI-driven productivity tools have revolutionised how people learn, work, and receive medical care (Khoury & Ioannidis, 2014), and the latter is the primary focus of this chapter, particularly in mental health, although other avenues will also be explored. Furthermore, digital tools have enhanced social connectivity, allowing individuals to maintain relationships across geographical boundaries, highlighting the necessity for these tools (Burr et al., 2020). The importance of digital wellbeing extends beyond individual mental health to broader societal wellbeing and economic productivity. As such, the development and progress of these tools stemmed from the need to rectify a long-standing inequality.

The Need for Digital Wellbeing Measures

Healthcare has historically been an unequal and deprived sector, mental health even more so, with the best services often restricted to the upper echelons of society in first-world countries. Imagine living with a debilitating mental illness but having absolutely no adequate care available. This is true for 80% of the people worldwide who are currently living with a mental illness in middle or low-income countries, and 90% of those lack any evidence-based care (Naslund & Deng, 2021). The mental health treatment gap is as high as 85% in low and middle-income countries and 40% in high-income countries (Ndetei et al., 2023). Certain governments, particularly in Africa and South-East Asia, spend less than 1% of their national healthcare budgets on mental health care (Patel et al., 2016). Various factors like stigma, poverty, geographical limitations, and cultural barriers aggravate the crisis, which calls for efficient initiatives to treat the gap, but building this remains an issue.

Mental health stigma is especially prevalent in low-income and collectivistic countries. Seeking traditional help in these countries could mean facing harmful remedies, forced fasting, poor living conditions, physical abuse, and even violation of human rights, especially in more rural or isolated sections of society (Ben-Zeev & Atkins, 2017). Most trained professionals are found to be inadequately trained or carry misbeliefs about mental healthcare, which in turn exacerbates stigma among those seeking help (Patel et al., 2016). This prevents people from seeking help due to the fear of social judgment, victimisation or shame. Moreover, the lack of culturally sensitive and ethical approaches limits treatment effectiveness. This calls for the need for culturally fair, anonymous, and ethical platforms that do not make individuals suffering from mental illnesses feel like victims. Shwab (2018) argues that digital technologies have the potential to drive a new era of reduced social inequality by improving access to essential services such as healthcare.

Most of the stigma-based gap persists in collectivistic countries, and digital mental health initiatives such as peer-to-peer online support forums where individuals experiencing mental health issues could connect would be helpful. Naslund and Deng (2021) also suggest that digital platforms can protest against misinformation being spread about mental illnesses and educate others about the truthful portrayal of what mental health problems look like. Most government initiatives rely on psychoeducational workshops and campaigns, which lack implementation and long-term engagement goals. However, what low and middle-income countries (LMICs) require is something tangible, which might not replace traditional therapeutic practices but can help individuals cope with mental illnesses. This brings into the picture self or artificial intelligence (AI) based, easy-to-access apps that can provide useful tips and accurate information that can be used to understand and manage problems efficiently, while still retaining anonymity. These digital apps can be made a cost-effective and less time-consuming solution to maximise use in countries where poverty prevents individuals from seeking professional help (Ben-Zeev & Atkins, 2017), as a detailed review has found positive trends for improved states in cases of depression and anxiety following intervention from these apps (Gallegos et al., 2024).

Addressing mental health gaps does not only mean increasing the number of resources available, but also includes developing resources that are efficient, available, and easy to use. At the moment, many digital apps and interventions do exist, but they might not be clinically validated or may lack the marketing needed amongst vulnerable populations and trained professionals. This is particularly true for LMICs, where both the tools and their impact are not particularly well explored. An interesting study by Ben-Zeev and Atkins (2017) found that most people with severe mental illnesses were overlooked in treatment or excluded from research due to potential risks of complex data and rejections. However, they expressed that most of them own mobile phones and are willing to seek mental health treatment through digital methods, thus making the need for digital initiatives stronger (Ben-Zeev & Atkins, 2017).

The Rise of Smart and Digital Wellbeing Initiatives

As of today, very few preventative measures are being taken to address mental health issues in LMICs (Patel et al., 2016). With the advancement of digital platforms and apps, they could be one of the first preventative measures for individuals living in poorer countries who are on the verge of having mental illnesses. However, while

the current state in LMICs may still be limited, the idea of using chatbots for the betterment of mental health is not a new one.

The idea of chatbots has existed for many decades, ever since the cognitive revolution in the field of psychology that occurred in the 1950s. ELIZA, one of the first chatbots developed in the 60s by Weizenbaum, was an early natural language processing program and simulated a therapist's conversational approach. While it was reliant on pre-scripted responses, ELIZA laid a foundation for all future mental health applications by showcasing the ability of AI to engage users in therapeutic dialogue (Weizenbaum, 1966). Over at Stanford in 1972, psychiatrist Kenneth Colby developed PARRY, which simulated a patient with schizophrenia. Utilising a natural language program, it was able to mirror the behaviour of someone with the same disorder. One of the first AI programs to pass the Turing Test, PARRY highlighted AI's potential to embody specific mental health conditions (Colby et al., 1971). While these historical attempts existed, they lacked the conversational depth and dynamism needed to replicate human conversation.

However, like always, technology offered a solution in the form of Generative AI and Large Language Models (LLM), transforming chatbots into dynamic and interactive systems, often providing real-time, appropriate, and empathetic responses. This ability to foster feelings of understanding and support comes from extensive psychologically sensitive data, containing clues into conversational tones and empathy. This contextual understanding is the key reason behind the improved responses (Zhao et al., 2023; Banh & Strobel, 2023), and a key step in improving the issues of accessible and well-developed systems for populations struggling with accessible healthcare.

LMICs primarily struggle with the accessibility of resources and do not have well-established traditional setups like maintained mental health hospitals or non-private clinics. Thus, low-resource-based mobile technology, such as text-based interventions and voice response technologies that preferably do not require a stable internet connection, would effectively utilise technological advancements in countries where it is most needed (Ben-Zeev & Atkins, 2017), while the developing systems of AI would ensure that these interventions are effective and empathetic.

Digital initiatives, however, are not meant to replace traditional therapy practices. It has occasionally been noticed that traditional therapy sessions remain unsupervised, and might leave the therapists and clients stuck in a rut owing to the lack of evidence-based care. Even if feedback is provided to the therapist, it comes at a much later point in the therapeutic relationship, where both the therapist and client have moved on to other issues. This is where digital initiatives like natural language processing and advanced text-based processing software can enter the picture as aids. They could help provide quick, evidence-based feedback and structure to a therapy session. Additionally, they can aid the therapist with automated summaries

and give feedback on paralinguistic features of the clients, such as facial expressions and vocally encoded arousals, which could be missed by a human therapist (Ben-Zeev & Atkins, 2017). They could use case studies and evidence-based data on mental health and coping strategies to serve as psycho-educators and co-therapists.

Thus, even though digital initiatives could be the answer to reduce the void in the number of people needing help and the number of people getting help, ideally, they must be used as supplementary interventions that could aid traditional practices and not replace them, albeit that may be a slow process. A common assumption about reducing the treatment gap comes from the belief that psychologists and psychiatrists must be the sole educators and providers of help and care. It is true that they are trained professionals and should be approached for professional help. However, non-professional support by adequately trained providers such as teachers, school counsellors, peers, and even religious leaders could help extinguish the gap among the population to a certain extent, utilising these chatbots as tools and aids (Ndetei et al., 2023). The role of digitalisation is key in fostering wellbeing and personal growth by integrating insights from behavioural and cognitive sciences on motivation and engagement to promote lasting habits and practices (Calvo & Peters, 2014; Desmet & Pohlmeyer, 2013; Peters et al., 2018).

Global Trends in Digital Wellbeing

While technology has empowered individuals with unlimited access to information, remote work opportunities, and digital healthcare, it has also contributed to issues such as screen addiction, cognitive overload, digital fatigue, and social isolation (Twenge & Campbell, 2018). The goal is to enable individuals to harness the benefits of digitalisation without compromising their overall wellbeing. A balanced digital lifestyle requires an awareness of how digital interactions affect cognitive functions, emotions, and social behaviours (Twenge et al., 2022). Recognising the pressing need to mitigate digital harm while maximising its benefits, various stakeholders, including governments, technology companies, mental health organisations, and researchers, have introduced smart and digital wellbeing initiatives.

These initiatives promote healthier technology habits, enhance digital literacy, and integrate wellbeing-focused solutions into everyday digital interactions. Tech companies have played a significant role in developing tools that encourage mindful technology use. Apple's Screen Time, Google's Digital Wellbeing tools, and Facebook's Take a Break feature are examples of industry efforts to empower users with greater control over their digital consumption. These features allow individuals to monitor screen time, set app usage limits, and reduce unnecessary notifications, fostering a more intentional approach to digital engagement, in turn fostering physical and mental health.

Governments and policymakers are also taking proactive steps to regulate digital wellbeing. France's "Right to Disconnect" law aims to prevent employees from being overburdened by after-hours work emails, thereby protecting work-life balance (Fana et al., 2020). Similarly, the European Union's Digital Services Act (2022) enforces ethical standards for online platforms, ensuring responsible AI deployment and content moderation. These regulatory measures reflect a broader commitment to creating a healthier digital ecosystem, and similar global frameworks need to be put in place, especially for mental health.

The advancements in digital mental health initiatives have not yet picked up the pace of digital-physical health initiatives, with the latter being widely used for diagnostic and screening purposes. For example, in the year 2023, the World Health Organisation (WHO) launched a global digital health initiative, but no international initiatives or toolkits are available for digital mental health to curtail broader mental illnesses. Moreover, there is limited mention of large-scale global investments in digital mental health (Naslund et al., 2019).

However, that has not stopped various global inventions of digital mental health interventions and devices that can aid in better awareness and building a robust social support system globally. In today's age, interventions for specific mental health disorders, wearable devices, virtual therapies, and preventative apps for yoga and meditation have led to the democratisation of digital tools. Preventative apps can also make life easier for users with chronic illnesses, with frequent reminders for medication and symptom checking fostering self-management. Digital communities have worked towards connecting individuals with similar experiences, extinguishing the stigma around mental illnesses, something that traditional communities would have taken decades to accomplish (Twenge et al., 2022).

Telehealth initiatives have started being used worldwide, incorporating diverse individuals, surpassing geographical barriers and catering to individuals with busy schedules, making therapy flexible and user-friendly. Telehealth also allows users with accessibility or age-related difficulties to easily access medical practitioners without having to travel miles at a stretch. The same also allows remote patient monitoring and patient interaction without putting a strain on either the patient or practitioner, even allowing for the development of virtual wards in the future for non-emergency cases (Abernethy et al., 2022).

Wearable devices like sleep trackers, blood pressure detectors, and biofeedback tracers have started developing, and play a very important role in integrating both mental and physical wellbeing, which is essential to look at an individual holistically. These tools can be further utilised in preventative healthcare, helping people keep track of their health markers even before they're able to seek medical advice. The same could also make the work of overworked and underfunded practitioners easier (Abernethy et al., 2022) as these wearable devices, like pedometers, can also

make symptom tracking easier, giving more accurate recollections so that doctors can offer tailored suggestions and treatments. Similarly, AI tools can be used for screening purposes in cases like MRIs and CAT scans, alongside human expertise, to expedite the process and catch potential risks even earlier (Alowais et al., 2023).

Kim (2024) carried out a meta-analysis to assess the effectiveness of AI chatbots and apps in addressing women's health, especially in a medical system which is often biased against their problems, often leading to delayed treatment and misdiagnosis. They were positively correlated to women's health, whether related to menopause, menstrual and hormonal health, reproductive and sexual health, or even cancer care and detection, highlighting their importance in the coming years.

Collaborations between public and private mental health and technology companies are fostering ethically sound and clinically validated digital interventions that are easy and safe for the general public to use. Lastly, the development of multilingual interventions ensures that countries with diverse populations are not overlooked in the inclusion of digital mental health initiatives (Ogugua et al., 2024).

Indian Trends in Digital Wellbeing

The current trends of digital initiatives in low to middle-income countries like India have taken significant strides towards digital mental health in their capacity. The COVID-19 pandemic played a huge role in making people aware that mental health services can go on even without physical proximity (Basavarajappa et al., 2022). The pandemic was a strong force in bringing out telemedicine and other digital initiatives in India. This brought forth the need for guidelines to practice telepsychiatry, which was established soon after the pandemic. To this date, however, practitioners prefer in-person consultations but are open to practising digital interventions like teleconsultation and telemedicine. A study found that 19% of the patients were open to tele-consultations compared to 2% of those who were not. This increase in demand could be a response to the usage of high-end digital devices and software for teleconsultations. However, the disadvantage of limited accessibility to mobile phones continues to prevail in remote areas (Basavarajappa et al., 2022).

While telepsychiatry has gained momentum post the COVID-19 pandemic, its efficiency depends not merely on technological advancements, but also on how well technology can replicate human warmth and connection. A study conducted on human mediation found reduced emotional and social responses amongst participants as a response to automated messages. This kind of rational thinking approach is useful if the clients wish to talk about sensitive and confidential issues like abuse or intimate partner violence. However, to gain trust and compliance from the user, it is advisable for automated chatbots to have human-like warmth and empathy (Chatterjee et al.,

2023). Fortunately, as of today, many government and organisational led initiatives have been taken that incorporate human mediation into digital interventions.

National-level initiatives in India have launched various campaigns and apps like *E-Manas* to advocate positive health amongst the young working population. Various digital initiatives have been initiated by several state governments in India that aim to increase the scope of digital mental health services, mainly through psychoeducation, tele-counselling sessions, training of community healthcare providers, and provision of helplines. Moreover, startups have also taken a step towards digital mental health by launching apps or online counselling services that cater to all age groups across all states (Wadhwa, n.d.).

Some Indian chatbots, like Infiheal's *Healo*, or *Wysa,* are trailblazing apps focusing on holistic mental health and offering a novel approach by providing constant emotional support and psychoeducation to their users. The use of generative AI for regular functionality like venting, insights, short-term solutions, long-term recommendations, and guided meditations alongside algorithms being able to factor in diverse modalities, specialisations, and even language preferences showcase the growth in the sector.

Although governments and start-ups have launched various digital initiatives, their implementation remains in the early stages due to countless issues, including regulatory gaps, access to phones, and lack of infrastructure. Moreover, simplification of user interfaces is needed to cater to the non-tech-savvy population of lower to middle-income countries. There are a lot of apps available on the market today catering to digital interventions; however, they need to be clinically and ethically validated to be able to survive in multi-linguistic countries like India (Menon & Varadharajan, 2020).

Hence, the future of digital mental health and the research surrounding it lies not only in the provision but also in the advocacy and inclusion of multilingual, ethically sound, and culturally adaptive digital mental health tools. As a society, we deserve more structured regulatory frameworks for digital mental health. At an individual level, we need to establish a sense of curiosity and willingness to use the existing digital mental health tools, seek professional help, or merely reach out to people to receive or give mental health support through digital platforms.

TYPES OF DIGITAL WELLBEING TOOLS

Technological advancements have taken over every part of an individual's life. Like any other advancement, it comes with pros and cons, with the significant challenge being digital wellbeing. Promoting digital literacy and quality technological resources has become essential to ensure the digital wellbeing of vulnerable groups

such as children and adolescents (Pedrouzo et al., 2024). Further, with children's increased engagement in digital play, research has highlighted the need for digital citizenship and self-regulation to ensure positive long-term outcomes (Bittner, 2021).

Unchecked digital habits can lead to chronic stress, sleep deprivation, and declining cognitive function, which, in turn, affect work performance, academic success, and interpersonal relationships. Without proper digital wellbeing strategies, individuals may experience constant connectivity pressure, leading to burnout and reduced engagement. Smart initiatives that promote structured screen time, mindful technology use, and digital detox practices can help restore a sense of balance in this digital-first world (Ben-Zeev & Atkins, 2017).

Various tools have been developed to promote digital wellbeing in multiple ways. One of which is by enabling individuals to manage their use of technology through complete disconnection or nuanced ways to manage connectivity (Nguyen, 2021). These tools promote digital wellbeing in everyday life through features such as self-regulation and monitoring, as well as supporting mental health issues through interventions and crisis management support. Research has indicated that digital wellbeing tools promote workplace wellbeing through better psychological needs satisfaction, a greater level of work wellbeing, and less burnout (Poirier & Gelin, 2024).

Digital Disconnection Tools

Modern devices often offer features tailored for unplugging from digital environments, as research indicates that excessive engagement with digital platforms, particularly social media, is linked to increased anxiety, depression, and sleep disturbances. Android's bedtime mode allows users to turn off notifications at night, while the work profile feature helps separate work and personal life by unplugging at the end of the day. Apple's focus feature similarly enables users to customise notifications and regulate access to different apps and content based on their current activity. These features have elicited positive responses and have been reported to help individuals improve their digital wellbeing (Stanphill, 2019). In addition, various apps like *StayFree, ScreenZen* and more can be used to limit screen time and app usage.

Usage Monitoring and Self-Awareness Tools

Balance mode features to track device usage are provided by both major platforms. Android's balance mode offers features to track phone usage and set app timers to monitor digital presence. Similarly, Apple provides access to screen time data, allowing users to analyse patterns of their device and app usage (Chantelle,

2023). These features help promote self-awareness, urging users to avoid addiction or overuse of specific apps and regulate screen time.

Apps such as SPACE Break Phone Addiction and Google Digital Wellbeing (GDW) focus on promoting digital wellbeing through user self-awareness. They use the theory of planned behaviour and nudge theory to encourage users to set goals, track their usage, and change behaviour patterns. Users felt a greater sense of perceived control and benefited from features such as visualization to regulate their digital usage (Almourad et al., 2021).

Digital Self-Control Mechanisms

A review by Roffarello and Russis (2023) identified 41 tools used for digital self-control, including Freedom, Let's FOCUS, and HabitLab. These tools were available on smartphones or PCs, and used a variety of delivery platforms, including mobile applications and browser extensions. These tools used strategies such as app blocking, device usage statistics, time limit restrictions, lockout mechanisms, persuasive messages, and negative reinforcement to enable users to regulate their device usage.

Sites such as YouTube offer modes to promote user focus. The *SwitchTube* mobile app was developed to enable users to toggle between focus mode and recommendations mode, simultaneously encouraging self-control and exploration. The initial research on its utility indicated that users experience greater agency, satisfaction, and goal alignment (Lukoff et al., 2023). Hence, self-regulation can also be promoted through such adaptable commitment interfaces in contrast to indiscriminate blocking and locking strategies

Parental Control and Family Management

Android's *Family Link* app allows parents to monitor and regulate their child's access to apps and websites, even providing the option to remotely lock the child's phone (Android, n.d.). Apple offers similar parental controls through its Screen Time features, which can be configured to limit access to certain apps and content. These tools help create age-appropriate digital environments and establish healthy technology habits from early childhood.

Mental Health and Wellbeing Support

The National Institute of Health Research (NHS) also launched *InHand*, a free-to-use mobile application to promote mental wellbeing among young people. It aimed to help users regain balance and regulate their emotions based on their mood. Research indicated that users found the app helpful in improving self-awareness and

self-monitoring of their moods (Simons et al., 2015). Apps like *Healo, Wysa,* and *Woebot,* alongside many others, can offer chatbots to assist users in talking about their issues. Furthermore, apps like *Calm* and *Headspace* are able to assist users in more symptomatic management, such as dealing with panic attacks. Apple's "My Wellbeing Toolkit" has been proposed to promote student wellbeing using iPad features such as Pages, Keynote, GarageBand, and Freeform (Coby, 2023). These creative applications can be harnessed to express emotions and develop coping strategies.

Healthcare Integration and eHealth Tools

The upcoming use of eHealth tools is reforming the healthcare domain by providing multi-domain, multi-informant integrated services. These tools deliver interventions, provide education, and facilitate communication between clients and professionals. A systematic review by Stewart et al. (2022), which included 39 papers, reported that such tools were used to track mental and general health across outpatient health clinics, hospitals, community outreach, or a combination of these settings. Although these tools are still in the basic stages of usage, they can be harnessed to offer the much-needed support to vulnerable populations across rural and urban regions and longitudinally.

Babbott and Serlachius (2023) highlighted that digital tools can offer essential psychological support for individuals with chronic conditions such as diabetes. They can help promote equity of services by combating cost, stigma, and accessibility barriers. The *EmpowerKids* tool enables professionals to discuss health and wellbeing with children from low-income families. Research indicated that the tool provided professionals with an understanding of the child's overall health and information about their individual needs (Skogberg et al., 2022).

Therapy Extension and Virtual Care

Digital tools can be used as therapy extenders and virtual care platforms to support wellbeing. Skills learnt within the therapeutic setting can be practised through these apps to support individuals outside the setting as well as make the therapy sessions more effective. Further, virtual care platforms such as *Brightline* can be used to offer online therapy support in remote locations and save travel costs (Schueller & Histon, 2023).

These tools can also be used for self-management to promote health and wellbeing with or without professional support (van Olmen, 2022). Finally, digital tools could offer self-guided approaches, appropriate linking to services, and customisation of services based on the specific needs of the user, even in cases of severe distress (Balcombe & de Leo, 2022).

ADVANCES AND BENEFITS OF DIGITAL WELLBEING TOOLS

The increasing integration of technology in daily life has led to the emergence of smart and digital wellbeing initiatives, which leverage artificial intelligence (AI), machine learning, mobile applications, and digital platforms to enhance physical and mental health. These initiatives encompass digital health tracking, smart wearables, AI-driven chatbots, and online mental health resources. The shift towards digital wellbeing solutions has been accelerated by advancements in health informatics, user-centred design, and behavioural science (Bucci et al., 2019).

Enhancement of Mental Health and Psychological Wellbeing

Digital wellbeing initiatives have significantly transformed mental health care by increasing accessibility, scalability, and effectiveness in delivering psychological support. AI-driven tools and mobile applications provide immediate and personalised interventions, addressing barriers such as stigma and lack of access to traditional therapy (Bucci et al., 2019). Research suggests that digital mental health interventions have been particularly beneficial in reaching underserved populations, reducing disparities in mental healthcare availability (Naslund et al., 2017).

AI-powered chatbots have gained prominence in providing psychological assistance through real-time conversations, offering coping strategies, psychoeducation, and emotional support (Zaky, 2023). Studies show that chatbot-based interventions can alleviate symptoms of anxiety and depression by engaging users in structured therapeutic conversations and guiding them through evidence-based exercises (Fitzpatrick et al., 2017). Furthermore, chatbots facilitate a sense of anonymity, encouraging individuals to seek help without fear of judgment, increasing mental health service utilisation (Miner et al., 2019).

Mobile-based cognitive-behavioural therapy (CBT) applications have experienced clinically significant improvements in mental health outcomes comparable to traditional face-to-face therapy. These applications also promote long-term adherence by allowing users to engage with therapy at their own pace, which enhances treatment effectiveness (Linardon et al., 2019). Digital mood-tracking tools have become essential in detecting early signs of mental health deterioration. These applications use machine learning algorithms to analyse behavioural patterns, including sleep, activity levels, and social interactions, enabling early intervention (Aggarwal et al., 2023). Moreover, digital self-monitoring tools have been particularly effective in workplace settings, where they help employees manage stress, track mood fluctuations, and implement self-care practices (Lang, 2024).

The integration of digital wellbeing initiatives in workplaces has been associated with improved productivity, reduced absenteeism, and enhanced job satisfaction

(Paganin & Simbula, 2020). Studies indicate that workplace digital interventions, such as mindfulness applications and AI-driven stress management tools, reduce burnout and improve employee emotional resilience (Joyce et al., 2016). Digital interventions also provide organisational benefits by fostering a culture of mental health awareness and support, leading to better overall employee wellbeing (Stratton et al., 2017).

Personalisation and Adaptive Interventions

One of the most significant advantages of digital wellbeing initiatives is their ability to deliver personalised and adaptive interventions. Digital platforms leverage real-time data analytics to tailor interventions according to individual needs, improving both effectiveness and user engagement (Deniz-Garcia et al., 2023). The integration of machine learning algorithms allows these platforms to continuously analyse user data, ensuring that recommendations are dynamic and responsive to changing health conditions.

Wearable health devices, such as smartwatches and fitness trackers, play a crucial role in personalised health monitoring. These devices continuously track physiological parameters such as heart rate variability, sleep quality, and activity levels, allowing for timely health recommendations based on real-time insights (Ajagbe et al., 2024). AI-powered chatbots further enhance personalisation by adapting their responses based on user input and demographic features, making interactions more relevant and supportive. Individuals interacting with adaptive AI chatbots experienced greater satisfaction and emotional relief compared to those using static, preprogrammed interventions (Sharma et al., 2023). The impact of hyper-personalised digital interventions extends beyond short-term engagement; research indicates that individuals who receive customised health recommendations are more likely to make sustainable behavioural changes. Personalised digital interventions have also been associated with increased motivation and self-efficacy, as individuals feel more empowered when recommendations align with their unique needs and preferences (Honka, 2024).

Improved Accessibility and Inclusivity

Traditional healthcare services are often constrained by geographical, financial, and infrastructural barriers, making it difficult for individuals in remote or rural areas to access timely medical and psychological care. Digital health interventions, including telemedicine services and AI-driven self-help tools, bridge these gaps by offering virtual consultations, real-time symptom monitoring, and digital therapeutic interventions (Hilty et al., 2021). The adoption of telehealth services has significantly

increased healthcare access for populations with limited mobility, reducing disparities in mental and physical healthcare availability (Kruse et al., 2020). Many digital wellbeing initiatives incorporate assistive technologies such as voice recognition, text-to-speech functionalities, and haptic feedback to ensure a more inclusive user experience (Chalkiadakis et al., 2024). AI-driven accessibility features significantly improve the usability of digital mental health resources for individuals with visual and auditory impairments, increasing engagement and adherence to treatment (Lillywhite & Wolbring, 2022). Furthermore, mobile health applications designed with adaptive interfaces allow users with cognitive disabilities to customise their experiences, enhancing self-management of health conditions (Grau et al., 2022).

Online mental health services provide anonymous and cost-effective support, reducing the fear of judgment and encouraging help-seeking behaviours among vulnerable populations. Mobile-based mental health interventions significantly improve psychological outcomes for individuals in low-income communities by providing free or low-cost access to cognitive behavioural therapy (CBT), mindfulness exercises, and crisis support resources (Naslund et al., 2017). Additionally, AI-powered chatbots and peer support networks available on digital platforms offer emotional assistance to individuals who may otherwise lack social support (Fitzpatrick et al., 2017).

Increased User Engagement and Motivation

The integration of gamification and interactive elements in digital wellbeing applications has significantly enhanced user engagement and motivation. Incorporating features such as progress tracking, goal setting, and rewards fosters sustained participation in health-promoting behaviours by making the experience more engaging and enjoyable. Gamification leverages psychological principles of motivation, such as reinforcement and competition, to encourage users to maintain their wellbeing goals. Individuals using health apps with gamified elements reported higher adherence to fitness routines and mental health exercises compared to those using non-gamified alternatives (Koivisto & Hamari, 2019).

Mobile fitness applications that integrate social challenges and virtual rewards have been particularly effective in increasing physical activity levels among users. These features tap into social influence and peer accountability, motivating users to engage in healthier behaviours. A large-scale study demonstrated that participants who engaged in social challenges within fitness apps were more likely to achieve their daily step targets and sustain increased activity levels over time (Zhang et al., 2021). Furthermore, research suggests that leader boards, badges, and achievement notifications create a sense of accomplishment, reinforcing positive behavioural change (Liu et al., 2023). Personalised notifications, which adjust based on user

behaviour, have been shown to reduce dropout rates in mental health and fitness programs by maintaining user motivation and accountability (Perski et al., 2019). Moreover, apps that provide real-time feedback on physiological and psychological metrics empower individuals to take greater control of their health (Ryan, 2022). The users who actively tracked their mood and behavioural patterns through mobile applications reported greater self-awareness and engagement in self-care activities (Torous et al., 2021).

Data-Driven Insights and Preventive Healthcare

One of the most significant advantages of digital wellbeing initiatives is their ability to harness large-scale health data for preventive healthcare. Wearable devices, mobile health applications, and AI-driven analytics enable the continuous monitoring of physiological and behavioural patterns, allowing for the early detection of potential health risks. Predictive analytics play a crucial role in digital health platforms by identifying individuals at risk of developing chronic conditions before symptoms become clinically significant. Machine learning algorithms analyse historical health data to detect subtle deviations from normal physiological patterns, allowing for early diagnosis and targeted interventions (Rajkomar et al., 2019).

Furthermore, AI-powered health monitoring systems provide real-time feedback to both users and healthcare professionals, enhancing the efficiency of disease management. AI-driven diabetes management apps demonstrate improved glycaemic control due to real-time feedback and tailored dietary recommendations. Similarly, digital mental health platforms that track mood fluctuations and sleep patterns can alert users to early signs of depressive episodes, prompting timely psychological interventions (Thirupathi et al., 2025). Continuous monitoring through digital tools enables early intervention, which significantly improves long-term health outcomes and reduces the burden on traditional healthcare infrastructure. The patients who received continuous digital health monitoring experienced a 30% reduction in hospital readmissions due to timely medical interventions and personalised health recommendations (Kashani et al., 2023).

Workplace Wellbeing and Productivity Enhancement

Digital platforms provide employees with access to a wide range of wellness resources, including mental health support systems, stress management programs, and virtual wellness coaching. One of the most impactful applications of digital wellbeing in corporate settings is the use of AI-powered mental health chatbots. These chatbots provide real-time psychological support, stress assessments, and personalised coping strategies, enabling employees to manage work-related stress

more effectively (Singh, 2024). Employees who utilise digital mindfulness and meditation applications exhibit improved focus, enhanced emotional regulation, and increased work efficiency (Mitsea et al, 2023).

Additionally, the integration of wearable technology in workplace wellness programs has provided valuable insights into employee health and ergonomics. The benefits of digital wellbeing initiatives extend beyond individual employee health, contributing to overall organisational success. Companies that invest in workplace wellness technologies report lower healthcare costs, increased employee retention rates, and improved workplace morale (Raqeeb, 2024). Furthermore, corporate wellness programs that integrate AI-driven behavioural health analytics help HR professionals identify early signs of burnout and implement targeted interventions, leading to more sustainable workforce management strategies (Itie, 2023).

Smart and digital wellbeing initiatives offer transformative benefits across multiple dimensions of health and wellness. From enhancing mental health support and personalised healthcare to increasing accessibility, user engagement, and preventive care, these initiatives revolutionise the way individuals manage their health. The integration of AI-driven analytics, wearable technology, and digital interventions fosters a proactive approach to wellbeing, enabling users to make informed health decisions. However, ethical considerations regarding data privacy and AI biases must be carefully managed to ensure sustainable and responsible implementation.

CHALLENGES AND ETHICAL CONSIDERATIONS OF DIGITAL WELLBEING TOOLS

There are various uses and benefits of smart and digital initiatives to promote wellbeing as the world gets increasingly digitised. AI-backed tools in particular have come to play a significant role in developing these tools and reducing the load on service providers, as we have explored. Despite their many advantages, these tools and initiatives are still relatively new and still have a lot of limitations. This is particularly true for AI-backed mental health chatbots, which provide a crucial service that needs to be carried out with the appropriate oversight to promote the principle of non-maleficence and beneficence for users. As they currently exist, these tools come with many limitations and challenges, whether they be technical, legal, or ethical.

Limitations and Risks in User Interaction

Regardless of the kind of AI-based chatbot, whether it relies on prescripted responses or generative AI, each comes with its drawbacks. The responses provided

can often have issues with accuracy, trustworthiness, and actual helpfulness, which can greatly influence user interaction. If the dataset that the chatbot is drawing from is flawed, the responses produced could be flawed or contain inaccurate information (Boucher et al., 2021). While generative AI can have independent and dynamic conversations, and most development teams will have professionals attempting to vet these conversations, there still lies the potential for risk due to the sheer scale of data being processed (Sedlakova & Trachsel, 2022).

The potential for chatbots using generative AI to say the wrong thing is always present, which could be due to a lack of empathy in responses, a lack of nuance, or even misleading information provided by the users. According to some, they may be closer to a self-help book as compared to a genuine therapeutic or medical conversation (Denecke & Househ, 2021). Despite best intentions, faulty responses by chatbots may potentially cause harm as well, as they may reinforce or encourage harmful behaviours, particularly in vulnerable populations (Coghlan et al., 2023). There is also the risk of this harm being irreversible, like the case of a Belgian woman who blamed a bot for her husband's suicide after conversations with the bot about climate change and eco-anxiety (Tamim, 2023) or when Character AI was implicated in a teen's suicide (Rose, 2024).

It may be possible for scripted conversations to avoid these pitfalls, but they come with their limitations. Due to following a specific structure for their conversations, they tend to be repetitive and lack the ability to respond organically to users, leading to frustration and reducing retention (Sedlakova & Trachsel, 2022). An alternative to avoiding the pitfalls of generative conversations could be human oversight over the conversations, but based on the scale and number of conversations from one chatbot to the other, it is often difficult to carry out feasibly (Coghlan et al., 2023).

Inability to Replicate Therapeutic Support

While these dynamic conversations are capable of providing a certain level of emotional support and strategies, they cannot fully replicate a therapeutic conversation. This is in part due to the lack of individual rationality and morality of the chatbots, which play a very important role in building therapeutic bonds. The inability to modify the strategies or suggestions to meet individual needs is a major setback to building a genuine therapeutic alliance (Coghlan et al., 2023). While chatbots may be great in certain situations, if the users desire to gain a new level of self-understanding or build a rapport to encourage vulnerability, they will fall short. Expecting human-like interaction and then not receiving it can make people feel worse at a moment when they hope to gain support. People need to be constantly

reminded that they are speaking to a bot to ensure that they do not expect human interactions (Sedlakova & Trachsel, 2022).

Misunderstandings with chatbots are a common feature of conversations, especially when long, complex messages are sent, often with metaphors or colloquialisms, leading to stilted or restricted responses. This situation is further worsened in different languages, as many nuances of the language might get missed leading to very technical or academic responses (Boucher et al., 2021). Due to the inherent nature of communication, many non-verbal cues can be missed, which might have hinted at key psychological or physiological insights (Khawaja & Bélisle-Pipon, 2023), further emphasising why these tools cannot be seen as a replacement for therapy. They are useful in breaking down coping strategies and techniques into easy-to-follow steps, but not all aspects of psychological or medical care plans are easy to break down into simple steps (Coghlan et al., 2023). While these chatbots and apps may be able to identify or offer some coping solutions for certain issues, they may lack the inherent knowledge and experience required to offer supplementary information or reassurance to users, especially in the case of more complicated or dual diagnoses (Burr et al., 2020).

Simply equipping the general population with psychometric tools and scales without the corresponding clinical knowledge can lead to misconceptions about diagnosis and what could help, worsening outcomes for individuals (Khawaja & Bélisle-Pipon, 2023). It can also be difficult for chatbots to keep track of everything mentioned or discussed over multiple user sessions or reference back to something mentioned previously to promote psychological insight, something therapists and medical professionals frequently do (Denecke & Househ, 2021).

Managing Crisis Situations

AI-backed chatbots particularly fall short in crisis situations and find it difficult to assess and respond appropriately. Issues of self-harm, suicidal ideation, and disclosure of abuse need to be handled by tonal assessments and perception of nuance where they may fail (Balcombe, 2023). Chatbots may not be able to make executive decisions on how to safeguard or when to trigger emergency responses, especially if users are obfuscating or not being completely forthcoming about their safety, as can often be the case in crisis situations. These apps might also lack the clinical knowledge to recognise an innocuous symptom as medically relevant (Zawati & Lang, 2024). Often, users might attempt to discuss suicidal or self-harm ideations or intrusive thoughts in an attempt to achieve therapeutic benefits, it might be difficult for the bot to differentiate between expressing thoughts versus actual intent of harm, possibly depriving users of that avenue of disclosure. Finally, at-risk situations are identified through algorithms, and the inability to differentiate might lead to a lot

of false positives, along with a reduction in the user's desire to disclose in the future (Burr et al., 2020).

The Role of Risks, Stigma, and Bias

A major issue arises with the risk of accidental disclosure. It is easier to communicate with an AI-based chatbot or use a digital health app, especially regarding stigmatised issues due to the relatively low personal and social risk involved. It may be possible that the comfort produced by not talking to a human might lead to accidental disclosure of crimes, including child abuse or sexual violence. While therapists and medical professionals have dedicated guidelines outlining the situations where mandatory reporting is required, a chatbot is not bound to those same guidelines, which brings up the issue of both social and legal liability (Coghlan et al., 2023).

An important feature of mental health chatbots and digital health apps is the ability they give users to actively track their symptoms and mood in their daily lives so their health providers have a better understanding of their struggles. While these frequent reminders can prove useful for some, they may also serve as unpleasant reminders to people about their mental or physical illness, especially if the person is having a relatively symptom-free day (Bauer et al., 2017). The tendency to track symptoms might also increase stigma by perpetuating the perception that those with mental illness need to be constantly tracked and monitored by those around the users if they come to know about their use of the app, especially if someone has a more stigmatised diagnosis (Ahad et al., 2023).

As mentioned, these AI-driven chatbots are frequently trained on large datasets from multiple sources. It is possible that they might only reflect the experiences of the majority, losing out on knowledge regarding the experiences of minority communities (Coghlan et al., 2023). The chatbot or app may be likely to miss out on linguistic, cultural, ethnic, or racial nuances in the presentation of symptoms and experiences, as well as the suggestions that it offers. Even practitioner-matching apps might fail to adequately match the correct therapist or medical professional to those with protected characteristics, increasing the pervasive bias in healthcare (Husain et al., 2022). Furthermore, due to potentially biased datasets, it is also possible that the chatbot or app may end up perpetuating harmful stereotypes and assumptions (Denecke & Househ, 2021). As it is often those populations who have difficulty accessing traditional mental health support or adequate healthcare, this bias would further isolate them or make them hesitant to access support (Khawaja & Bélisle-Pipon, 2023).

The Dangers of Over-Reliance

One of the major features, which is the constant accessibility and 24/7 support offered, could also create future complications. It can often create an over-reliance on the AI-based chatbot or app, which might lead to users withdrawing from traditional mental health support or isolating themselves from loved ones because they feel they are being supported by these tools. People might choose not to see a doctor or nurse if the app assuages their worries (Bucci et al., 2019). The interaction is easier, often with lower levels of anxiety and higher levels of disclosure, which might increase the resistance to accessing alternative support (Sedlakova & Trachsel, 2022). However, these interactions are not a true replacement for individual, personalised professional support or personal relationships. This over-reliance to the detriment of in-person support can worsen isolation and loneliness, not to mention health outcomes (Khawaja & Bélisle-Pipon, 2023). It is also necessary to assess what is driving the over-reliance on digital platforms. If it stems from avoidance behaviour, this dependence could further worsen outcomes for users, especially in cases of social anxiety (Bucci et al., 2019).

Lack of True Accessibility

Digital wellbeing tools can often have different outcomes for those with differing mental illnesses, and research and companies need to acknowledge this and reflect the same in their work. The impact of the tool may differ for someone struggling with depression versus someone with schizophrenia, and the chatbots or apps are often not as helpful for more severe conditions unless specially designed (Husain et al., 2022).

While these tools aim to increase accessibility, especially for vulnerable populations, their user interfaces may make it difficult for the geriatric population or those with learning difficulties or neurodegenerative conditions to use (Rodríguez-Martínez et al., 2023). The information about conditions or coping strategies may often be presented in increasingly technical terms or presuming a certain level of knowledge in the user which could make comprehension difficult, especially with a rural or economically weaker population. While these issues can often be resolved by subsequent questions and interactions, too technical a response might deter people from future usage, especially as many people might not be willing to engage in those follow-up conversations (Burr et al., 2020).

The effectiveness of digital tools is inextricably linked to the amount of digital literacy an individual possesses and their general beliefs about the use of technology, creating the potential for significant generational and cultural differences, with younger generations from more urbanised settings more likely to make use of these

tools (Boucher et al., 2021). Older generations also carry a greater distrust towards technology and AI, especially in the healthcare field, which might make their usage levels low (Rodríguez-Martínez et al., 2023).

Privacy Struggles and Absence of Regulations

The lack of existing guidelines and regulatory bodies can enable companies to take advantage of the lack of security for the privacy of users. Their data could be sold to third-party organisations and bodies, violating the inherent need for confidentiality in healthcare, as they are not held to the same standards of professional conduct as mental health or medical professionals (Husain et al., 2022). The lack of involvement from regulatory bodies also means that many tools are not up to medical standards and do not necessarily reach the people who might need support the most due to limited outreach and access to information (Wies et al., 2021). Many available apps are not evidence-backed, and it can be difficult for the average user to differentiate those from genuinely helpful tools, especially for mental health, when most apps are marketed as a replacement for therapy (Denecke & Househ, 2021).

While apps claim to anonymise their data, this can often be de-anonymised through data triangulation. Due to the lack of regulations regarding the storage of data, this could be hacked into and leaked by cyber-criminals, publicising medical records and further exacerbating the stigma associated with accessing mental health support or certain medical conditions (Coghlan et al., 2023). These privacy issues also might lead to mistrust in users, not just in the tool itself but the medical professional who suggested it, damaging the working relationship and worsening health outcomes (Wies et al., 2021).

THE WAY FORWARD

While we have explored the various issues and challenges that exist in the current use of AI-based chatbots and digital tools in promoting wellbeing, we also need to acknowledge the important role they play. The tools exist and are being utilised because they are needed in society. They can address and reach vulnerable populations and provide mental health support and healthcare to many who need it but are unable to access traditional support. It is also undeniable that there is a dearth of mental health and healthcare providers. This gap in support, particularly mental health support, cannot be made up by people alone, especially not when we consider round-the-clock support. Digital tools and AI-driven chatbots can greatly help in these situations and ease the burden on professionals while providing crucial

support. However, the existing issues need to be addressed and dealt with while moving forward.

Collaborative Development

If we wish to extensively use AI-backed tools as a collaborative tool to provide mental and physical healthcare and support, it becomes necessary to include diverse voices in their development. Doctors, nurses, psychiatrists, psychologists, and other professionals need to be extensively involved in vetting the datasets and responses of the tools. Extensive studies need to be carried out to ensure that they are performing the task they were designed for appropriately, with no harm to the user (Khawaja & Bélisle-Pipon, 2023).

Companies need to include not only professionals but also service users and patients in the development and deployment of these tools to ensure that they are meeting user needs in a manner that is most needed by them (Sedlakova & Trachsel, 2022). In addition, key stakeholders such as families, caregivers, or specific populations need to be included in the process. Additionally, the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) makes it clear that people with disabilities, both physical and psychological, have to be involved in the development of these tools (Carr, 2020).

There needs to be constant scrutiny and transparency in the development process, and the rationale behind decisions needs to be fully explored to ensure that they are the most effective tool. As datasets tend to cater to the majority, which might lead to biases in the AI-driven chatbot or app, this deficit needs to be made up for. It is necessary to include diverse voices in the development of these tools to ensure that we can make up for any implicit biases in datasets and ensure all populations will be adequately supported, whether that might be ethnic, linguistic, gender, or sexuality minorities (Khawaja & Bélisle-Pipon, 2023).

Uniformity in Standards

A key step forward is ensuring that there are national and international guidelines and frameworks for the management of these digital initiatives. International and national guidelines should be set up for uniform standards for these tools and apps, with allowances for cultural variations to ensure the maximum number of people can be reached from all different sectors of society (Khawaja & Bélisle-Pipon, 2023). As of the moment, development is primarily done with technological companies with an interest in mental health or accessible healthcare rather than health professionals directly, influencing the manner in which these tools are developed. There needs to be a global consensus on what apps and tools should be qualified to provide mental

health support or medical assistance, and what standards need to be met, otherwise, people might push their apps into less regulated areas and societies. There also needs to be clear guidelines on issues of ethical and legal liability to ensure minimal harm to users (Balcombe, 2023). Legal advisors and cybersecurity experts need to be on board to ensure that legally and regulatory robust systems are put in place to protect both the users and the product (Hall et al., 2024).

Appropriate Marketing and Usage

A major issue is the marketing of mental health tools due to it being a less-regulated field. There are numerous apps and websites which promote themselves as a solution for people's mental health worries and promote themselves as offering solutions. The associated marketing of these tools as 'replacement for therapy' is part of the problem. It is necessary that adequate measures are taken to ensure that people are fully aware of the potential of these tools and are not misguided into assuming their role, a statement which holds true for medical apps as well (Khawaja & Bélisle-Pipon, 2023). This marketing can also lead people to assume that these bots and apps will value anonymity and confidentiality in the same manner as real-life therapists or medical professionals, which would not be the case. Platforms need to carefully monitor the apps they are allowing and how they are being marketed. Individual apps and websites should highlight how their tools have been designed and validated to allow users to make informed decisions (Wykes et al., 2019).

Increasing User Awareness and Expanding Use

Users should also be psychoeducated on the precise tools and support these apps can provide, as well as the restrictions and limits of their support, so that they know what to expect. Companies should make it clear how they differ from traditional forms of mental health support, allowing users to make educated decisions about the decision to engage with the tool and under what circumstances to do so (Balcombe, 2023).

A key factor is that these apps and tools cannot function as replacements for traditional support but can function as collaborative tools, easing the burden on professionals or providing users with support that might be more difficult to find elsewhere. In addition to providing accessible and 24/7 support, these tools could also be used to ease the burden on practitioners (Denecke & Househ, 2021). They can be used for more administrative tasks, whether tracking symptoms to ease the load of history taking or tracking case notes and prescriptions, allowing the practitioner to spend more time supporting the individual (Balcombe, 2023). Tools can be further used to assist in diagnosis by keeping a track of symptoms and experiences which

might be missed in human error and allowing for easier and earlier cross-diagnosis and screening (Alowais et al., 2023).

Enhancing Accessibility and Engagement

While digital health interventions are primarily favoured for the anonymity they offer, they can also make it easier for people to connect with each other. Online support groups or forums could reduce the level of isolation and struggle users might be facing in coming to terms with their health struggles, particularly mental health. This is particularly true for those in more reclusive or isolated areas or belonging to societies which still hold considerable stigma towards seeking mental health support (Bucci et al., 2019). Traditional support groups may be difficult to access due to limited availability or anxiety towards social interaction, something that online support could ease while still allowing people to form connections, reducing the reliance on the AI-based chatbot or app as well.

Incorporating these features could allow users to access more holistic mental health support and self-management through these tools. They could gain timely access to different kinds of support they might need. This could include interactive psychoeducation designed by professionals to ensure they understand their struggles, using CBT-informed techniques or coping skills through the app, communicating with the chatbot to gain emotional support, and even connecting to other people to share and seek advice and experiences. It could allow users with specific medical diagnoses to connect with others and hear survivor stories as well (Bucci et al., 2019). Permitting telehealth appointments could also allow people from remote areas to directly access professional expertise at little to no personal expense or hassle, thus improving remote patient monitoring (Alowais et al., 2023).

These tools should also be able to connect people to in-person therapists or mental health support to ensure that they have resources available even if they have chosen to opt out of online support (Khawaja & Bélisle-Pipon, 2023). This could be carried out through collaborations with hospitals, clinics, NGOs, and other individual bodies to ensure that people can access support regardless of their usage of these tools, as people are often unaware of the extent of resources available.

Optimising User Interface and Interaction

A key to making these digital tools more effective is to ensure that it does not feel like reading a textbook or being in a lecture. Interactive and aesthetically appealing content, when delivered through the use of relatable situations or stories, makes it more engaging to interact with and easier for people to understand what they are going through, especially younger generations. It is also important to make the

interface easy to use, appealing, and with minimal technical glitches to ensure that people wish to use the tool (Garrido et al., 2019). An easy interface would not only make it easier for older generations and those with low digital literacy but would also be easier to use when users might be in a mental health crisis (Rodríguez-Martínez et al., 2023). For the same, experts, whether they be technical, pedagogical, social workers or support workers, could come together to develop the most effective manner in which to disseminate information.

Improving Security and Privacy Safeguards

A key question is what happens to a user's data if they decide to stop using the app or AI-based chatbot but are concerned about the information they have shared with it. It should be possible for users to fully withdraw from these apps and delete their data upon withdrawal to ensure privacy and safety. This would also increase people's faith in these systems and increase their usage (Khawaja & Bélisle-Pipon, 2023).

As privacy and potential data leaks are such a major concern due to the sensitive health information they handle, apps could include multi-factor authentication to ensure privacy and limit any unauthorised access to information. End-to-end encryption could be used to reduce the potential risk of any data leaks (Banerjee et al., 2024). While it might not be possible to have constant oversight over every interaction, there can be certain trigger points, whether too much time on the app or website or the mention of specific trigger points, where clinicians could be encouraged to provide oversight and make judgment calls. The same should be communicated to users to ensure they can make an informed decision about their usage of the tool, reducing the safety risks associated with the app (Carr, 2020).

Industry-standard security protocols would have to be implemented for these digital tools so that their systems are fully secure. These would also need to be frequently patched and updated to ensure that any discovered vulnerabilities are addressed and fixed (Carr, 2020). Data protection could be carried out through the use of experts in consumer and privacy correction (Coghlan et al., 2023).

Future Research Direction

More qualitative studies need to be carried out on existing apps and AI-driven chatbots while developing new ones to ensure frequent feedback on how they are currently functioning and ease issues regarding engagement and accessibility. There's still a gap in the existing literature about the effectiveness of specifically designed mental health tools versus regular digital tools. This could be done by identifying the needs of the population, current barriers to usage, and user experiences regarding

how these tools have been impacting the current healthcare landscape. Longitudinal studies could be conducted to assess which populations and mental health conditions are best suited to using AI-based chatbots (Hall et al., 2024).

It is necessary to conduct constant research into the efficacy or risk of harm caused by AI applications and for them to be constantly monitored for any unusual activities or interactions. Human experts, whether in practice, policy, or research, can collaborate with developers to ensure that safety measures and regulations are in place, especially as there is sensitive medical and personal data involved (Balcombe, 2023).

More cross-cultural research needs to be carried out on the effectiveness of digital wellbeing tools in different societies with different attitudes towards and understanding of both mental health and accessing traditional healthcare. Most existing tools are developed in Western and first-world countries, and their conceptions of mental health or certain diagnoses might not translate to all cultures. Definitions and understanding of terms like 'depression' can vary from culture to culture, as can the techniques and strategies suggested. Research into culturally adapted and non-adapted tools could give insight into their efficacy.

It often proves difficult for developers to assess their product accurately once it is implemented in healthcare settings or larger societies, as an accurate evaluation would require hundreds of participants and evaluators across different societies and with different issues. However, if clinically effective and accessible tools are developed but are not able to be implemented due to issues in evaluating their impact, it is the user who suffers and fails to receive care which would help them. It is necessary to bridge the gap that exists between developed and implemented products, which would require multiple stakeholders to be involved (Hall et al., 2024).

CONCLUSION

As the world gets increasingly digitised, there exist multiple opportunities and tools to meet people's changing needs and enhance their wellbeing. There have been many revolutionary changes in smart and digital wellbeing tools, and mental health AI chatbots have been an emerging trend. While there are many advantages to their use and they are able to fill an ever-growing gap in healthcare, they also have drawbacks. However, what cannot be denied is that they play a crucial role in the future of healthcare and reducing the treatment gap, which makes their effective development and deployment all the more important. Hence, it is imperative to involve several stakeholders and regulatory bodies to ensure that patient needs are being met while maintaining their safety as technology continues to advance rapidly.

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Key Terms and Definitions

Digital Wellbeing: It is a multidimensional concept that encompasses psychological, emotional, and social aspects of technology use.

Generative AI: Those artificial intelligence models which carry out independent and dynamic conversations with information drawn from large datasets. Thus, capable of more authentic and engaging conversations.

Scripted AI: Those artificial intelligence models which carry out conversations through pre-written responses and follow a defined structure.

Natural Language Processing (NLP): Natural language processing is a part of artificial intelligence and refers to a computer's ability to understand human language.

Mental health chatbots: AI driven chatbots specifically designed to hold conversations surrounding mental health. They can provide emotional support, coping strategies, and more to users.

TeleHealth initiatives: Delivery and facilitation of health-related services through digital communication platforms.

Telepsychiatry: A branch of telemedicine that provides psychiatric care and mental health services remotely via video calls, mobile apps, or online platforms.

Screen Addiction: A compulsive overuse of digital screens (smartphones, computers, etc.) that disrupts daily life, mental health, and social interactions.

Digital Fatigue: A state of mental, emotional, and physical exhaustion caused by prolonged screen exposure, excessive online interactions, and digital multitasking.

Non-maleficence: The idea that tools designed to promote digital wellbeing should not unintentionally cause harm or stress to users.

Data Leaks: When identifying information and sensitive health details become accessible to a wider unauthorized audience due to lax security and privacy measures.