How effective are digital/e-health interventions for supporting prisoners with mental ill-health? An integrative review

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Abstract

Purpose – *There has been a move towards the implementation of digital/e-health interventions for some time. Digital/e-health interventions have demonstrable efficacy in increasing individual empowerment, providing timely access to psychological interventions for those experiencing mental ill-health and improving outcomes for those using them. This study aims to determine the efficacy of digital/e-health interventions for individuals detained in prison who experience mental ill-health.*

Design/methodology/approach – *A systematic search of five academic databases – CINAHL, ASSIA, PsycINFO, Embase and Medline – was completed in December 2020 and updated in February 2022. The review was guided by the Whittemore and Knafl (2005) framework for integrative reviews. A total of 6,255 studies were returned and screened by title and abstract. A full-text screening of nine (n = 9) studies was conducted.*

Findings – *No study met the inclusion criteria for the clinical efficacy of digital/e-health interventions in a prison setting. Subsequently, a review of the literature that made it to the full-text review stage was conducted, and gaps in the literature were identified to inform policy, practice and future research.*

Originality/value – *To the best of the authors' knowledge, this is the first integrative review conducted on the efficacy of digital/e-health interventions for mental ill-health in prison settings.*

Keywords *Prison, Mental health, Digital/e-health interventions, Service provision, Integrative review*

Paper type *Literature review*

Background

In 2008, the World Health Organisation (WHO) recommended service delivery reforms to make health services relevant and responsive to the changing needs of society (WHO, 2008). Since then, significant advances have been made in the context of technology utilisation in health care (Bhavnani *et al.*, 2016; Morilla *et al.*, 2017). Technology in health care or digital/e-health is defined as the use of communications and information technology to support health and health-related areas (World Health Organisation 2019a, 2019b). Internationally, specific recommendations have been published on the use of digital/e-health interventions (World Health Organisation, 2019a, 2019b). These encompass increasing acceptability among health-care workers by ensuring intuitive digital/e-health intervention design and usability, addressing issues of data security and providing adequate staff training in the delivery of digital/e-health interventions (World Health Organisation, 2019a, 2019b). These recommendations also speak to the need to increase acceptability among users of health services by ensuring, as far as practicable, that digital/e-health interventions are low-cost/no-cost and that concerns relating to data confidentiality and security are addressed (World Health Organisation, 2019a, 2019b). Digital/e-health in a general sense is extremely vast, with its applications varying from robot-assisted surgery (Diana and Marescaux, 2015), telemedicine (Lesher and Shah, 2018), online clinics

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(Connolly *et al.*, 2021; Haleem *et al.*, 2021) to the use of wearable digital devices to improve cognition and working memory (Moreno *et al.*, 2021) and to help achieve higher socialisation (Voss *et al.*, 2019). The use of digital/e-health is evident across the life span, from perinatal populations (Wassef and Wassef, 2022), paediatric populations (Tully *et al.*, 2021) and older adults (Merrell, 2015).

In the context of mental health, the use of digital/e-health interventions has been identified as a way to increase service user empowerment (Department of Health, 2020), which is congruent with the current emphasis on a recovery-oriented delivery of mental health services (Health Service Executive, 2018, 2020; World Health Organisation, 2019b). Digital/ e-health has also been identified as a way of increasing awareness of mental ill-health and providing timely and early access to mental health services, particularly in primary care (Department of Health, 2020). There is increasing evidence to support the use of Web-based interventions for the management and treatment of mental ill-health particularly in the context of perinatal mental health (Ashford *et al.*, 2016). In youth populations, digital/e-health interventions were found to be effective for managing diverse mental health problems (Zhou *et al.*, 2021), as well as demonstrating efficacy in the prevention of various mental health problems and increasing positive mental well-being (van Doorn *et al.*, 2021). In the context of problem drug and alcohol use, digital/e-health interventions have demonstrable efficacy in reducing problem alcohol use for those with co-morbid depression (Schouten *et al.*, 2022). There is further evidence that digital/e-health interventions can help reduce problem cannabis use in non-clinical settings (Hoch *et al.*, 2016), helping to improve overall treatment outcomes (Campbell *et al.*, 2014).

Barriers to engagement with digital/e-health interventions include severity of distress and mental health "symptoms", technical issues with use (Borghouts *et al.*, 2021), a lack of personal contact (Borghouts *et al.*, 2021; Schmidt-Hantke *et al.*, 2021; Zeiler *et al.*, 2021) and concerns about data protection and online safety (Schmidt-Hantke *et al.*, 2021). The advantages of using digital/e-health interventions, however, cannot be ignored and include improved resources for managing mental ill-health (Andersson and Titov, 2014), anonymity, cost-effectiveness (Schmidt-Hantke *et al.*, 2021) and ease of access (Zeiler *et al.*, 2021; Marcu *et al.*, 2022).

There are more than 10.77 million individuals being detained in prison as sentenced or on remand (Fair and Walmsley, 2021). Within the prison population, mental health problems are highly prevalent (Fazel *et al.*, 2016; Al-Rousan *et al.*, 2017). In the USA, it is estimated that one in four people in prison experience serious psychological distress, while approximately 37% of those being detained in state and federal prisons have a mental health diagnosis (Bronson and Berzofsky, 2017). Similarly, two in five of those sentenced to prison in Australia have a mental health diagnosis, and one in four are taking psychotropic medications (Australian Institute of Health and Welfare, 2019). In the European context, it is estimated that 45% of adults in prison in the UK experience depression or anxiety (Durcan, 2021), while it is estimated that mental ill-health and poor coping skills are contributory factors in over half of all self-harm episodes in prisons in the Republic of Ireland (National Suicide Research Foundation, 2021). The prison population is therefore highly vulnerable and require timely access to quality mental health services (Bright *et al.*, 2022).

In spite of the prevalence of mental ill-health in the global prison population, no review of the clinical effectiveness of digital/e-health interventions was found for the prison setting. Reviews pertaining to psychological interventions have been conducted. For example, Beaudry *et al.* (2021) explored the use of psychological interventions for the reduction of recidivism, but the focus was not on the management and treatment of mental ill-health. Furthermore, not all the studies included in this review focused on digital/e-health interventions. Although Batastini *et al.* (2016) conducted a systematic review and meta-analysis on the use of tele-psychological services for people involved in the criminal justice setting, the focus was purely on substance misuse and not the management and treatment

of mental ill-health. Another example is provided by Morris and Bans (2018) who conducted a general review of the literature to outline the efforts being made in UK prisons to develop digitally enabled services to support rehabilitation. Once again, the focus was not the treatment and management of mental ill-health. Leach *et al.*'s (2022) scoping review focused on digital health interventions being used to manage mental health disorders and substance-use disorders in the criminal justice system. However, the bulk of the evidence presented relates to interventions for substance use disorders (Leach *et al.*, 2022). Subsequently, a gap was identified for a review of the efficacy of digital/e-health interventions used in the prison setting solely for mental health problems.

At this point, it is important to outline how this review differs from the review conducted by Leach *et al.* (2022). Criminal justice is a complex system that features various organisations and professionals that include but are not limited to police, courts, judges, solicitors, prisons and probation (Patterson, 2018). Firstly, to focus on the criminal justice system as a whole produces broad-reaching results not specifically related to the population within the prison system. Secondly, scoping reviews are used for general searching of various studies to map the range, extent and nature of literature in a particular field or subject (Peterson *et al.*, 2017). They provide an overview of a broad topic and therefore, the results generated are again broad-reaching. Thirdly, the aims of the Leach *et al.*'s (2022) review were to describe trends concerning digital health interventions for mental health and substance use disorders that are implemented within the criminal justice system and to review the available evidence for the impact of digital health interventions on criminal justice, mental health and substance use outcomes, and not on the clinical effectiveness of digital health interventions for the management/treatment of mental ill-health. Finally, the search strategy used by Leach *et al.* (2022) included only one academic database, PubMed (Leach *et al.*, 2022). Therefore, the aim of this review is to examine the efficacy of digital/e-health interventions for the management and treatment of mental ill-health in the prison settings.

Methods

An integrative review was selected to help identify, analyse and synthesise published data and produce alternative viewpoints (Christmals and Gross, 2017). To guide this review, the framework by Whittemore and Knafl (2005) was used; this includes five stages: problem identification; searching the literature; data evaluation; data analysis; and presentation of results. The preferred reporting items for systematic reviews and meta-analyses statement (PRISMA) (Page *et al.*, 2021) was also used in reporting this review. The search protocol was registered on the international prospective register for systematic reviews, PROSPERO (CRD42021249935). A population, intervention and outcome (PIO) framework was used to guide the search strategy and to formulate the following research question: "How effective are digital/e-health interventions for supporting prisoners with mental ill-health?"

Search strategy

An initial search of the Open Grey database, Google Scholar, PROSPERO and the Cochrane Library was conducted to ensure no duplication of research. A detailed search of five electronic databases was conducted in December 2020 and repeated and updated in February 2022: MEDLINE, Psychological Information Database (PsycINFO), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Excerpta Medica DataBASE (EMBASE) and Applied Social Sciences Index and Abstracts (ASSIA). Owing to a dearth of research in this area, there were no restrictions placed on geographical origin or language. The National Institute for Health Research (NIHR), as a result of the randomised evaluation of the effectiveness and acceptability of computerised therapy trial in 2009, generically endorsed computerised cognitive behavioural therapy as the stated criteria for the initial treatment of depression (Gilbody *et al.*, 2015) and, subsequently, this date limiter was set. The terms in the PIO framework (Table 1) were searched as topics, medical subject

Table 1	PIO framework
Population Prisoners with mental ill-health	prisoner* OR imprison* OR convict* OR inmate* OR offender* OR sentence* OR jail OR correctional OR criminal justice OR incarcerat* OR criminal* OR remand OR felon OR penitentiar* OR detain* OR penal OR mental health OR mental health problem* OR mental ill-health OR mental ill health OR psychiatric problem* OR psychiatric disorder* OR psychiatric illness* OR psychological problem* OR psychological issue* OR psychological illness* OR symptom* AND
Intervention Digital/e-health psychological interventions	psychological intervention* OR psychological therap* OR psychosocial intervention* OR psychosocial therap* OR cognitive behavio?ral therap* OR cognitive behav* therap* OR CBT OR cognitive therap* OR behavior therap OR behavio?r* therap* OR exercise OR exercise training OR psychotherap* OR mindfulness based cognitive therapy OR computeri?ed therap* OR intervention* OR counsel* OR structured education program* OR patient education OR education program* OR disease management OR multimod* treatment OR combined modality treatment* OR multimod* treatment* OR combined therap* OR combined modality therap* OR cognitive behvaio?r* analysis system of psychotherap* OR mindful* based cognitive therap* OR talk therap* OR brief cognitive behavior?r* therap* OR brief CBT OR structured cognitive behavior?r* OR cognitive psychotherap* OR computerized cognitive behavior?r* therap* OR computer assisted therap OR computer therap* OR computerized CBT OR web based CBT OR internet-based CBT OR web-based therap* OR web-based cognitive behavior?r* therap* OR web-based intervention* OR internet-based intervention* OR internet-based intervention OR structured education OR internet-based therap* OR web-based therap* OR therap* OR cognitive behavior?r* OR treatment* OR education AND
Outcome Efficacy of outcomes	efficacy OR effectiveness OR clinical effectiveness OR effectiveness OR treatment effectiveness OR treatment efficacy OR clinical efficacy

Source: Table by the authors

headings, keywords and combined using Boolean operators. The search terms were tested against pre-selected articles, and forward and backward citation tracking was conducted to maximise the return of relevant studies.

Eligibility criteria

Studies were to be included if:

- the participants were aged between 18 and 65 years;

- they reported on any digital/e-health intervention validated for the management of mental ill-health; and

- they were conducted in a prison setting.

Studies were to be excluded if:

- the participants were aged under 18 years or over 65 years;

- they did not report on the use of validated digital/e-health interventions for mental ill-health or reported the use of telemedical/consultation use only; and

- were not conducted in a prison setting.

The rationale for the chosen age limiters is that those under 18 years of age are generally detained in juvenile centres, whilst prisons house adults aged 18 and over. We excluded those aged over 65, as the older adult population have unique mental ill-health presentations and needs.
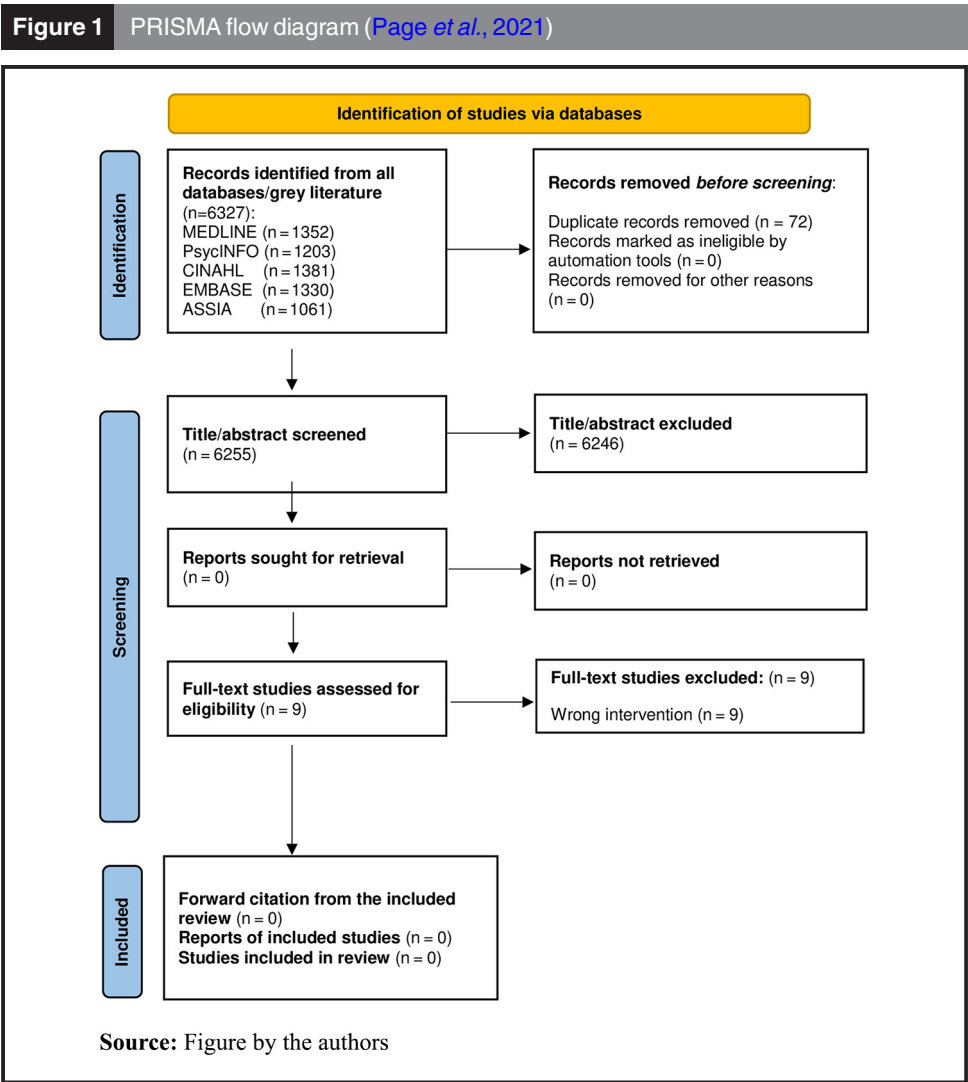
Study selection

All citations were exported to Covidence (Veritas Health Innovation, 2022) for title/abstract and full-text screening. The titles were independently assessed by two authors (AMB and AG) against eligibility criteria. A total of 6,327 records were returned, and after the removal of duplicates ($n = 72$), 6,255 studies were retained for title and abstract screening. A total of

nine ($n = 9$) citations met the eligibility criteria for full-text review, of which no study ($n = 0$) was eligible for inclusion (see Figure 1).

Findings

Although no studies met the inclusion criteria, this is a finding in itself and demonstrates the lack of empirical evidence on the efficacy of digital/e-health interventions in supporting people in prison with mental ill-health. It was estimated in 2012 that 9% of all systematic reviews in the Cochrane Database of Systematic Reviews were "empty", meaning no studies were highlighted for inclusion (Yaffe *et al.*, 2012). Yaffe *et al.* (2012) suggest that reviews may be empty because the subject area is too new with insufficient evidence. It is also possible that the research question may be incongruent with the research area or that inclusion and exclusion criteria are too stringent (Yaffe *et al.*, 2012), such as the focus on clinical effectiveness and efficacy, which may have ruled out more descriptive papers. In the context of this review, it is possible that the use of digital/ e-health interventions is not just new but more challenging to implement and research in a prison-based context.

Figure 1 PRISMA flow diagram (Page *et al.*, 2021)

Source: Figure by the authors

A number of authors have highlighted that there are variations in the reporting of these empty reviews, as no guidance exists on how to report a review that has no evidence to include (Higgins and Green, 2008; Yaffe *et al.*, 2012). In the absence of guidelines, the review team discussed the implications of having no study eligible for inclusion. It was decided to focus on the studies that progressed to full-text screening to provide commentary on the gaps within these studies that contributed to this lack of evidence. Of the nine studies that made it through to full-text screening, the most common reason for exclusion was that the interventions detailed within the studies were not digital/e-health interventions (Loper and Tuerk, 2011; Crane and Blud, 2012; Chen *et al.*, 2014; Gold *et al.*, 2014; Morgan *et al.*, 2014; Van Horn *et al.*, 2018; Rosenfeld *et al.*, 2019; Comartin *et al.*, 2021; Scanlon and Morgan, 2021). The second-most common reason was that studies were conducted outside the prison setting but instead with individuals involved in the criminal justice system (Van Horn *et al.*, 2018; Rosenfeld *et al.*, 2019; Scanlon and Morgan, 2021). These results may indicate that the use of digital/e-health interventions is not being adopted as widely in prison settings as in the general population. Alternatively, if digital/e-health interventions are being used, they are not being researched from the perspective of clinical effectiveness and efficacy. A systematic review by Givens *et al.* (2021), which focused on synthesising the findings related to 14 interventions for juveniles and early adults in a prison context in the USA, found that only two interventions were evidence-based and none were offered on a large-scale basis. A review of the papers cited also suggests that none of these interventions were digital/e-health interventions and instead consisted of bibliotherapy, one-to-one therapy and group therapy. According to the European Patients' Academy on Therapeutic Innovation (EUPATI), those detained in prison are considered a vulnerable population, and therefore, ethical approval to conduct research with this population may be more challenging to obtain (European Patients Academy on Therapeutic Innovation, 2023) and, subsequently, conducting research in the prison setting with this population may be a challenge. A review of the nine studies that made it through to full-text screening indicates that in some locations, an evidence base for some face-to-face psychological therapies is being developed, including an evidence base for music therapy (Chen *et al.*, 2014; Gold *et al.*, 2014), therapy incorporating the principles of cognitive behaviour therapy (Crane and Blud, 2012; Morgan *et al.*, 2014) and parenting interventions for improving emotional adjustment (Loper and Tuerk, 2011). One study did not specify the type of intervention used (Comartin *et al.*, 2021) but detailed the implementation of diversion services and in-jail treatment. However, the majority of these studies ($n = 6$) were from high-income countries, being conducted in the USA (Loper and Tuerk, 2011; Morgan *et al.*, 2014; Van Horn *et al.*, 2018; Rosenfeld *et al.*, 2019; Comartin *et al.*, 2021; Scanlon and Morgan, 2021), the UK (Crane and Blud, 2012), Norway (Gold *et al.*, 2014) and China (Chen *et al.*, 2014). Finally, five ($n = 5$) of these studies' participants were exclusively male (Crane and Blud, 2012; Chen *et al.*, 2014; Gold *et al.*, 2014; Morgan *et al.*, 2014; Scanlon and Morgan, 2021); three ($n = 3$) featured both male and female participants (Van Horn *et al.*, 2018; Rosenfeld *et al.*, 2019; Comartin *et al.*, 2021) and only one ($n = 1$) featured exclusively female participants (Loper and Tuerk, 2011). This supports the assertions of Bright *et al.* (2022) that women in prison are marginalised by the research community. However, it is important to note, for context, that female prisoners account for just under 6.9% of the world prison population (Fair and Walmsley, 2021).

Discussion

In an Irish context, the "New Connections" report (Porporino, 2015) identified that prisoners experiencing "common" mental health problems such as depression and anxiety were at risk of *falling through the cracks* (Porporino, 2015, p. 65). To avoid this, a collaborative approach to care between psychology and prison health services was

recommended (Porporino, 2015). Subsequently, to help bridge this gap, the Irish Prison Service (IPS) has since committed to the introduction of a layered model of care that is applied to the prison population as a whole. This model details the importance of mental health awareness on a preventative level up to highly specialised and complex needs that require multi-disciplinary approaches (IPS, 2016). In addition, the IPS has committed to the implementation of preventative approaches for those in prison custody, akin to the Improving Access to Psychological Therapies (IAPT) programme used as a benchmark for accessing psychological therapies in the general population in the UK (IPS, 2016, 2019).

The IAPT programme was launched in 2008 to increase access to interventions for anxiety and depression and to enable all individuals to better manage their mental health. In 2009, positive practice guidelines were published to support the application of IAPT in prisons (National Health Service, 2009), and these guidelines were updated in 2013 (National Health Service, 2013). Within the guidelines, the importance of "removing barriers to access and continuity of care" (National Health Service, 2013, p. 8) is highlighted, and it is acknowledged that a key barrier for offenders accessing mental health services is a lack of service provision (National Health Service, 2013). Indeed, this is also reflected internationally, where 66% of those incarcerated in the USA report having received no mental health care while in prison (Ring and Gill, 2017), and the most recent annual report of the IPS details 54% of young people aged 18–24 and a significant number ($n = 26$) of individuals serving life sentences are on a wait list for psychological input in Irish prisons (Irish Prison Service, 2021). Many of these individuals may be released from prison before they can access interventions (Irish Prison Service, 2021).

The House of Commons Justice Committee on Mental Health in Prison (2021) in the UK recommends in their fifth report that the gap between mental health needs and the services provided in the prison setting must be bridged to ensure an integrated care model exists whereby prisoners can access appropriate mental health care without delay, congruent with the ethos of the IAPT model. Furthermore, Dr Graham Durcan, of the Centre for Mental Health in the UK, made specific recommendations for the development of digital service capacity within prison systems in the UK to include the use of psychological interventions (Durcan, 2021). Morris and Bans (2018) stated there were positive signs in the development of digitally enabled interventions in the prison setting. Indeed, this was evident during the COVID-19 pandemic, where prison psychiatric services required restructuring (Fovet et al., 2020). Real-time telepsychiatry encounters (Burton et al., 2021) and programs (Khairat et al., 2021) were digitalised in prisons in the USA. Outside of the pandemic era, tele-neuropsychiatry clinics have been used in prisons in India (Agarwal et al., 2019). The authors report high staff and patient satisfaction with these approaches (Agarwal et al., 2019; Burton et al., 2021; Khairat et al., 2021) but also indicate concerns over staff training, digital resources and digitally enabled infrastructure (Agarwal et al., 2019; Burton et al., 2022). While these initiatives are focused on the use of digitally enabled technology for the conduct of consultations, they provide a platform on which to build capacity for the use of more innovative and transformative interventions for those detained in prison experiencing mental ill-health.

Recommendations

In spite of no studies being identified for inclusion in this review, the value of this finding identifies a clear gap in the current evidence in the area of prison mental health service provision. Firstly, there is a need for robust studies on the feasibility of using digital/e-health interventions in a prison setting. The complex adaptive nature (Preiser, 2019) of the prison system needs to be acknowledged, and in this context, researchers need to work closely with prison services to identify the possible barriers to the use of digital/e-health

interventions in a prison setting, particularly around security, accessibility, cost implications and the focus of the intervention. Secondly, research also needs to be conducted into the acceptability of digital/e-health interventions in a prison setting, particularly from the perspective of the individuals in prison, who are the intended users of these interventions and from the perspective of staff who will be expected to facilitate or enable the running of the interventions. This particular phase would provide an excellent opportunity for participatory research where the relevant stakeholders and communities are fully integrated into the research process, having jurisdiction over decision-making, analysis, quality and dissemination of findings (Maccauley et al., 1999). Involving individuals in prison in the research process may contribute to rehabilitation while also enabling the construction of an identity outside that of "prisoner" or "mental health service user", which is congruent with recovery principles (Leamy et al., 2011). However, it must be acknowledged that globally, prisons operate both in the public and private sectors, which may complicate the process of involving those detained in prison in research as well as considerations relating to ethical approval (European Patients Academy on Therapeutic Innovation, 2023).

Thirdly, there is a need for research focusing on the efficacy of digital/e-health interventions in a prison setting. Depending on the intended focus of the intervention, it would be important to decide what outcomes are to be measured to determine efficacy; short-term outcomes such as symptom reduction and increased functionality may be appropriate for some interventions, while long-term outcomes such as complex psychological interventions focusing on schemas may be appropriate for other interventions. Similar studies have been conducted without the digital/e-health intervention component (Loper and Tuerk, 2011; Gold et al., 2014; Morgan et al., 2014) and may provide guidance to researchers moving forward in this space. However, Heilbrun et al. (2020) caution that psychological tests and measures, while relevant, reliable and valid for use during face-to-face consultations, may not translate to the remote/online platform as service user and patient observation are impeded.

Once feasibility, acceptability and efficacy have been determined, it will be necessary to scale up the body of evidence and conduct randomised control trials (RCTs), considered the gold standard on the hierarchy of evidence. Again examples of RCTs being conducted in prison settings are available as reference points but do not include digital/e-health intervention components (Gold et al., 2014). Finally, it will be important to consider the transferability and generalisability of these interventions to the wider prison environment, again with due consideration to the cultural, societal and hegemonic structures that govern the running of prison systems and with due consideration to the gender-specific needs of those currently serving prison sentences. Ultimately, the need for digital/e-health interventions is to provide practical solutions for the ongoing high prevalence rates of mental ill-health in prison populations. The implementation of digital/e-health interventions in a prison setting may help reduce the burden of care for services that are operating at or beyond capacity, but most importantly, it will help to ensure that the most vulnerable in our society are getting access to evidence-based interventions that will contribute to improved health outcomes.

Limitations

The findings of this review need to be read in the context of the following limitations: in accordance with the aim of the review, the database search strategy included terms that would have seen the return of articles that reported clinical effectiveness and efficacy. Therefore, it is possible that papers discussing the initial stages of a digital/e-health interventions, such as pilot studies, descriptive papers and qualitative studies, were not returned and, therefore, not reported on. This impacted our ability to provide recommendations for practice or to provide a comprehensive commentary on gaps within the literature.

Conclusion

The use of digital/e-health interventions in the management of mental ill-health has demonstrable efficacy in a general sense, and the changing landscape for the provision of interventions in the digital space provides an opportunity to implement these in the prison setting. The findings of this review highlight the stark gaps that exist in the current evidence related to the use of digital/e-health interventions in prison settings, particularly when policies for their use have been in existence since 2013. Our findings offer a "call to action" to address the voids that exist to ensure adequate and timely access to quality mental health services for those serving prison sentences.

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