Exploring the Digital Divide for People with Serious Mental Illness:

A Scoping Review

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Abstract

Background: Among people with Serious Mental Illness (SMI), the digital divide can lead to increased social isolation and reduced access to healthcare services. Although digital technology in mental healthcare services, known as Telemental Health (TMH), has been introduced years ago, the onset of the COVID-19 pandemic in 2020 has dramatically boosted its applications. As society continues to digitalise, ensuring access to digital resources is crucial for addressing social and health inequalities, particularly among vulnerable populations like those with SMI. *Objectives*: The general aim of this scoping review was to understand the extent of digital exclusion and the underlying barriers to digital inclusion among individuals with SMI. *Method*: The methodology of a scoping review was chosen. An exhaustive literature search of the databases PubMed, PsychInfo, Scopus and Web of Science was conducted and identified 16 studies. A thematic analysis was done in order to synthesise and develop patterns within the findings. *Results*: The most prominent underlying barrier to digital inclusion reported by all included studies was a lack of digital literacy. Further barriers were physical access, financial constraints, mental health-related difficulties, indifference to, mistrust and anxiety towards the use of technology. *Conclusion*: Despite increased access to digital technology, barriers to digital inclusion among people with SMI remain, particularly in digital literacy. The findings highlight the need for targeted interventions, such as comprehensive digital literacy training and supportive measures, to enhance digital inclusion. Future research should focus on the impact of digital exclusion on mental health and the effectiveness of tailored digital inclusion programs.

Keywords: digital divide, digital exclusion, serious mental illness, scoping review

Exploring the Digital Divide Among People with Serious Mental Illness:

A Scoping Review

As the world experienced the beginning of the COVID-19 pandemic in early 2020, worldwide lockdowns and quarantines forced mental health professionals into alternative ways of providing mental healthcare (De Vos, 2021). The global mental healthcare field experienced a rapid shift from traditional face-to-face counselling and psychotherapy to the remote delivery of mental health assessment and treatment (Aisbitt, Nolte & Fonagy, 2023). In turn, the digitalisation of mental healthcare has become much more common (National Institute of Mental Health, n.d.). However, the pandemic has impacted not only the delivery of mental healthcare but also mental health needs (Aisbitt, Nolte & Fonagy, 2023). The increased need for providing virtual mental healthcare services (National Institute of Mental Health, n.d.) has highlighted that digital mental healthcare will be the future, enforcing the digital turn.

The use of technology to provide mental health services is known as *Telemental health* (TMH). There has been a rapid growth in the uptake of TMH during the COVID-19 pandemic (Abraham et al., 2021) due to a range of potential benefits such as the enhanced accessibility and convenience for both patients and providers, the facilitated entry into care or the reduced stigma associated with seeking help. Some practitioners are even transitioning to entirely virtual practices, by using innovative technologies to deliver high-quality care remotely (National Institute of Mental Health, n.d.). More and more studies support that TMH is effective, safe, and will remain in use for the foreseeable future (Fortier et al., 2022; Hadler et al., 2021)

The rising value of TMH care raises the question of what happens to those left behind on the digital turn. Alongside many positive opportunities and chances, the digitalisation has brought upon new kinds of challenges and researchers argue that there is a risk that telehealth

might perpetuate or even exacerbate inequalities of access and care (Aisbitt, Nolte & Fonagy, 2023).

Theoretical Background: The Digital Divide

In the second half of the 1990s, the concept of the Digital Divide has emerged as attention grew towards the subject of unequal access to media. The term *Digital Divide* was first used in 1995 by researchers in their report *Falling through the Net*, published by the US Department of Commerce's the National Telecommunications and Information Administration (1995). By the millennium, the problematic of the digital divide was firmly established on the societal and scholarly agenda (Van Dijk, 2020). Today, the most common definition of the digital divide is: "A division between people who have access to and use of digital media and those who do not" (Van Dijk, 2020, p. 2). According to Van Dijk (2017), digital media is comprised of information and communication technology, primarily computers and the internet, as well as (smart-)phones and other digital hard- and soft-ware.

A majority of research in the early 1990's on the digital divide has focused primarily on individuals' physical access to the Information and Communication Technology (ICT) infrastructure; a computer and an internet connection. It was suggested that the origins of inequalities lie in getting physical access to digital technology and the continuity of such access (Van Deursen & Helsper, 2015).

Approaching the millennium, there was a rapid uptake of computer possession and internet connection among the general population of developed countries (Van Dijk, 2020). The observed internet hype led critics of the digital divide to pronounce it as a myth and non-existent (Block, 2004; Thierer, 2000). However, with more and more people in developed countries gaining access to ICT infrastructure, researchers attention focused on the idea being that physical

access to digital media was not reaching its' fullest potential without the requisite skills, knowledge, and support for effective use (Van Dijk, 2020).

The focus shifted from a technological problem to social, economic, cultural, and political one (Van Dijk, 2020). In what has been defined as the second level of digital divide, researchers and policymakers moved beyond the parameter of physical access to a more nuanced level of digital divide (Van Dijk, 2020). Theoretical models turned to emphasising digital inequalities as a consequence of inequalities of skills, use and interests (Van Dijk, 2006).

Digital Exclusion among People with SMI

People with SMI have been defined as "someone over the age of 18 who has (or had within the past year) a diagnosable mental, behavioural, or emotional disorder that causes serious functional impairment that substantially interferes with or limits one or more major life activities." (SMI Adviser, 2024, para. 1). They suffer from mental illnesses such as bipolar disorder, major depressive disorder, schizophrenia, and schizoaffective disorder (SMI Adviser, 2024) as well as anxiety disorders, eating disorders, and personality disorders, if the degree of functional impairment is severe[1] (Evans et al., 2016).

People suffering from SMI often deal with prejudices and negative attitudes, leading to the stigmatisation, discrimination, and social exclusion of individuals (Baumann, 2007). They suffer from long-term illnesses involving substantial functional impairment over multiple symptom domains. These impairments often lead to an inability to maintain gainful employment, poor social support, incarceration, and coexisting substance use disorders (Evans et al., 2016).

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[1] All mental health conditions have the potential to produce impairment and many instances of mental illness may broadly qualify as "serious" according to various uses and interpretations of the term. Within scientific literature, the terms *serious* and *severe* are used interchangeably when referring to SMI. Within this review, both are referred to as *SMI*.

A theoretical model on social and digital exclusion (Helsper, 2012) suggests that people with mental health difficulties may more likely experience digital exclusion due to more likely experiencing social exclusion (Morgan et al., 2007). Being digitally excluded during the COVID-19 pandemic, as self-care became increasingly reliant on digital technologies, has meant to be unable to socialise and access information and face increased loneliness. A lack of digital engagement has led to decreased access to healthcare services (Spanakis et al., 2021a). In fact, internet access has been recognised as a "super determinant of health" due to its' influence in health outcomes and other social determinants of health (Turcios, 2023).

Besides barriers such as lack of access or skills leading to digital exclusion, people with SMI suffer from illness specific barriers such as symptoms and cognitive deficits that lead to digital exclusion. Nonetheless the topic of digital exclusion among people with SMI has received little attention (Spanakis et al., 2021a).

As our world will continue to digitalise, the people able to engage with the digital world, are expected to benefit. The digital divide has the potential to create further social and health disparities within our society and in order to tackle inequalities, researchers must pay attention to the digital inclusion of people with SMI. The increasingly influential mental health technologies have given rise to the importance of investigating how inequitable access to digital media may impact those with mental illness. By addressing these issues, this review aims to ultimately close the digital divide by improving access and outcomes for individuals with SMI. In order to give an overview of current research available, the following research questions were formulated:

RQ₁: What is the extent of the digital exclusion among people with SMI?

RQ₂: What are the underlying barriers to digital inclusion among people with SMI?

Method

In order to answer the research questions, a scoping review was conducted. This methodology aims to synthesise an emerging body of literature on a chosen topic and identify the possible gaps in existing research, offering researchers a comprehensive understanding of the amount of and types of current studies (Munn et al., 2018, Mak & Thomas, 2022). In the context of the study, the methodology was selected to explore the relatively understudied topic of digital exclusion among individuals with SMI (Spanakis et al., 2021a).

To be included in this review, papers had to entail information about the digital divide or digital exclusion or examine the underlying barriers to digital inclusion in a sample with SMI. According to the definition mentioned above, another criterion is the diagnosis of a serious/severe mental illness and for studied participants to be over the age of 18 years (SMI Adviser, 2024). Papers were included, if they were published post 2010 for reviewal, which is substantiated due to the significant changes and ongoing impacts of the Affordable Care Act (ACA) signed in March of 2010 for modern telehealth. Papers were excluded, if they were not addressing the research questions. A wide range of study types (peer-reviewed journal articles, grey literature, quantitative, qualitative, mixed-methods studies as well as case studies) were included in this review to comprehensively capture the extent and nature of research. The research was limited to papers published in the English language.

To identify potentially relevant papers, an exhaustive literature search of the following databases was conducted from March to April 2024: *PubMed*, *PsychInfo*, *Scopus* and *Web of Science*. By searching multiple databases, the likelihood of identifying relevant literature from different perspectives was increased, ensuring that as many relevant studies as possible were captured. These specific databases were chosen to cover the extensive amounts of academic

Table 1

Used Search Strings in Databases

Databases	Search string
PubMed, PsychInfo, Scopus and Web of Science	("digital divide" OR "digital exclusion" OR "digital inequalities" OR "digital inequality" OR "digital equity" OR "digital disparities" OR "digital gap" OR "digital divides" OR "digital division") AND ("mental illness" OR "mental disorder" OR "psychiatric illness" OR "psychiatric disorder" OR "psychiatric disabilities")

literature across various fields (science, social sciences, medicine, psychology, and other sciences), allowing for access to a wide range of relevant studies and publication types, including grey literature.
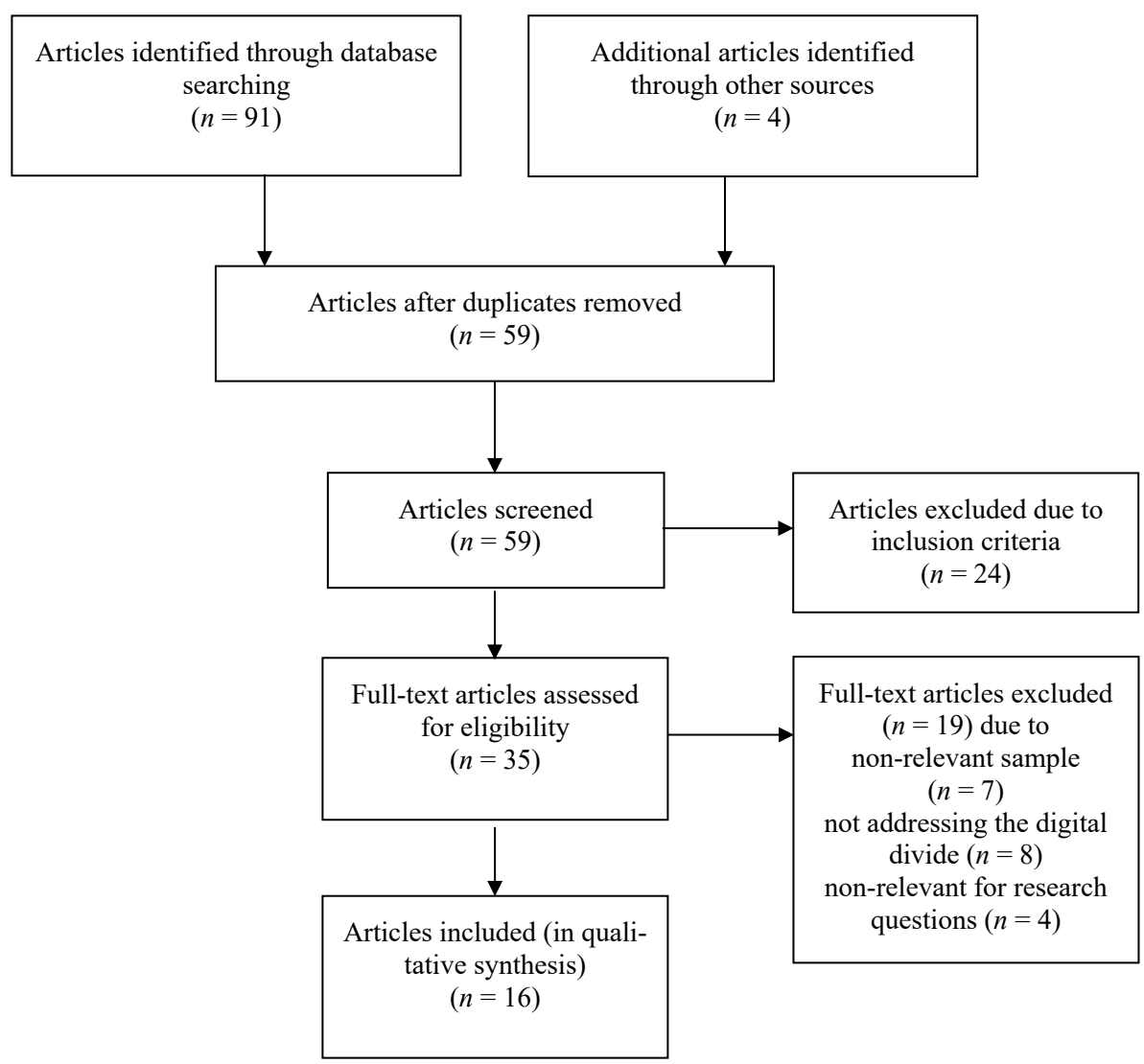
To ensure a comprehensive literature search for this review, key concepts related to "digital divide" and "serious mental illness" were identified and combined using Boolean operators (AND, OR, NOT) to ensure an effective and comprehensive search strategy (Table 1). Various synonyms and related terms were generated, including alternative phrases, and broader or narrower terms. Controlled vocabulary and thesauri specific to each database were used to find standardized terms. The search strategy was tested and refined to optimize the number of search results.

The screening was done independently by the researcher following the PRISMA extension for scoping reviews (PRISMA-ScR) checklist (Tricco et al., 2018). The final search results were exported into the Covidence systematic review software. The initial search uncovered 95 papers of which 36 duplicates were removed automatically. A first screening of titles and abstracts was conducted, and 24 papers were removed due to not meeting the inclusion criteria. During a second screening, 35 papers were thoroughly read and screened for eligibility resulting

in 16 relevant studies fur further assessment (Figure 1). Of those, all were included in the follow-

ing review.

Figure 1

PRISMA Flow Diagram (Moher et al., 2009).

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┌─────────────────────────────────┐     ┌─────────────────────────────────┐
│ Articles identified through      │     │ Additional articles identified   │
│ database searching               │     │ through other sources            │
│ (n = 91)                         │     │ (n = 4)                          │
└─────────────────────────────────┘     └─────────────────────────────────┘
                 │                                       │
                 └───────────────┬───────────────────────┘
                                 ▼
                 ┌─────────────────────────────────┐
                 │ Articles after duplicates removed│
                 │ (n = 59)                         │
                 └─────────────────────────────────┘
                                 │
                                 ▼
                 ┌─────────────────────┐          ┌─────────────────────────────┐
                 │ Articles screened    │─────────▶│ Articles excluded due to     │
                 │ (n = 59)             │          │ inclusion criteria           │
                 └─────────────────────┘          │ (n = 24)                     │
                          │                        └─────────────────────────────┘
                          ▼
                 ┌─────────────────────┐          ┌─────────────────────────────┐
                 │ Full-text articles   │─────────▶│ Full-text articles excluded  │
                 │ assessed for         │          │ (n = 19) due to              │
                 │ eligibility          │          │ non-relevant sample          │
                 │ (n = 35)             │          │ (n = 7)                      │
                 └─────────────────────┘          │ not addressing the digital   │
                          │                        │ divide (n = 8)               │
                          ▼                        │ non-relevant for research    │
                 ┌─────────────────────┐          │ questions (n = 4)            │
                 │ Articles included (in│          └─────────────────────────────┘
                 │ qualitative synthesis)│
                 │ (n = 16)             │
                 └─────────────────────┘
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The data extracted was title, authors, year, study design, setting, country, SMI sample (age, gender), SMI diagnosis, and findings related to the extent of digital exclusion and the underlying barriers to digital inclusion. Data was extracted based on the research questions, hence not all data was extracted from all papers (see N/A in Table 2).

The methodology of a thematic analysis was chosen in order to synthesise and develop patterns within the findings of included studies (Joffe, 2011). The extracted data was synthesised in an inductive 'bottom up' way, as themes identified are strongly linked to the data themselves (Braun & Clarke, 2006). Firstly, the researcher familiarised themselves with the data, read and re-read the papers and highlighted any text that was directly answering the two research questions. Then the researcher generated initial codes from the extracted information and collected for and searched for themes. The next step was the reviewal of themes. Preliminary themes were checked in relation to one another. Next, clear definitions and names were generated for each theme. And lastly, the final definitions and themes were generated by relating back to the research questions and producing the results (Table 2).

Results

Table 2

Summary of Studies Investigating the Digital Divide for People with Serious Mental Illness

Study	Study design	Setting (Country)	SMI Sample, N Age (years), M (SD) Gender, *n* (%)	SMI Diagnosis, n (%)	Key findings related to the extent of the digital exclusion	Key findings related to the underlying barriers to digital inclusion
Athanasopoulou et al. (2017)	Cross-sectional survey	Psychiatric clinic (Finland and Greece)	*N* = 229 Age, N/A Male, *132* (58.0)	SSD (F20–29; ICD-10)	Finnish: 87%: current users, 2%: previous users, 11%: had never used the Internet. 95%: had a home Internet access and email address. About two-thirds were using the Internet at least once a day. Greek: 59% had never used the Internet, 8% previous Internet users. 33% current Internet users. 82% of Internet users had a home Internet access. 18% had access through other places. 88% had an email address, 70% were using the Internet at least once per day.	Expense; not needing it; disability/pain; difficulty in concentration for long periods of time (Finish 28%, Greek 33%). Finnish: lack of knowledge in using computers/Internet; broken Internet connection/computer. Greek: afraid of breaking technology; no time to engage with it; very difficult to use; lack of knowledge; preferring to spend my free time with friends and family; relative using it for them; unaware of the Internet; confusion.

Note. SSD: Schizophrenia Spectrum Disorders   BPD: Borderline Personality Disorder   OCD: obsessive-compulsive disorder

PTSD: Post-traumatic Stress Disorder   SMI: Serious Mental Illness   N/A: not applicable

Table 2 *(continued)*

Study	Study design	Setting (Country)	SMI Sample, N Age (years), M (SD) Gender, *n* (%)	SMI Diagnosis, n (%)	Key findings related to the extent of the digital exclusion	Key findings related to the underlying barriers to digital inclusion
Borzekowski et al. (2009)	Cross-sectional survey	Two outpatient mental health treatment centres and one assertive community treatment site (United States of America)	*N* = 100 Age, N/A Male, 63 (63.0)	Schizophrenia = 72 (72.0) Bipolar disorder = 16 (16.0) Depression = 8 (8.0) Anxiety = 2 (2.0) and other disorders	28% owned their own compute. 34% reported having access to the Internet (among those usage was reported to be infrequent). 36% used the Internet. 36% used the Internet a few times a year. 30% used the Internet a few days a month. 33% went online several times a week. 53% had an e-mail account.	Expense (81%); lack of skills or knowledge (78%); cognitive difficulties (56%); problems with typing (55%); lack of access to a computer or to the internet (53%). A small percentage lacked interest in using the Internet. Internet nonusers reported interest in the Internet. 17% described a likelihood of using this technology in the near future.
Carras, Mojtabai and Cullen (2018)	Cross-sectional survey	Urban community psychiatry clinic (United States of America)	*N* = 189 Age, N/A Female, 121 (64.0)	Affective disorder (~60%) Psychotic disorder (~30%)	The digital divide between people with SMI and the general population is lessening.	N/A

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Carras, Mojtabai and Cullen (2018)					The use of media is not uncommon. 59.3% were internet users. 41.4% of mobile phone users had access to the internet and 25.3% access to twitter.	
Ennis et al. (2012)	Cross-sectional structured interviews	Urbanised communities (United Kingdom)	*N* = 121 (36.0, 11.5) Male, 81 (66.0)	Onset of psychosis in the previous 12 months	Technology access and use were similar to the general population where 91% have mobile phone access and 78% own a PC/laptop.	Expense and lack of skills as reasoning for not engaging with computers. Sample reported a significant desire to increase their use of computers.
Greer et al., 2019	Semi-structured interviews	Large secondary mental health provider (United Kingdom)	*N* = 20 (56.7, 11.3) Male, 13 (65.0)	Psychosis Affective disorder Personality disorder Eating disorder or other disorders	N/A	A perceived lack of knowledge and confusion over how to use Web-based services; uncertainty regarding potential sources of help for overcoming their digital exclusion; financial barriers;

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Greer et al., 2019						mental health difficulties, specifically psychosis including relapses and hallucinations and forgetting how to use the technology; memory difficulties: hindered previous attempts to overcome digital exclusion.
Kozelka et al. (2023)	Survey and interview	Community mental health centre with a research department in an urban center (United States of America)	N = 10 (53.7, 10.4) Male, 6 (60.0)	Psychotic disorders, 6 (46.2) Mood disorders, 4 (30.7) Other, 3 (23.1)	43% of clients (deemed ineligible for the study) did not own a smartphone and/or did not have access to the internet at home.	Limited understanding e.g. being unclear with what a notification was; overwhelm and agitation; fees and little financial flexibility to access tools; missing of digital literacy in the majority of participants; most clients had a very limited understanding of the devices they owned.

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Li and Glecia (2023)	Multiple case studies	Mental health and addiction services program (Canada)	*N* = 4 (49) Male, 2 (50.0)	Depressive disorder Anxiety disorder OCD PTSD Hoarding disorders Bipolar type I disorder Substance use disorder Schizophrenia disorder	N/A	Inadequate digital health literacy e.g. a lack of knowledge about the benefits of digital technology to mental health; inability to make informed health decisions via digital technology, which resulted in social isolation and the deterioration of mental health symptoms during covid.
Middle and Welch (2022)	Focus groups and interviews	Community organisations supporting people with SMI (United Kingdom)	*N* = 9 (54, 14.73) Female, 5 (55.6)	Anxiety, 4 (44%) Depression, 2 (22%) Panic disorder, 1 (11%) Hearing voices, 1 (11%) BPD, 1 (11%)	N/A	Loss of digital skills when mentally unwell; negative experiences online; complicated platforms; perception of "not for us"; lack of access; mistrust; lack of opportunity to learn, use or refresh digital skills; impact of mental health condition; social referents not digitally engaged.

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Robotham et al. (2016)	Longitudinal survey and case notes	Secondary mental healthcare provider (United Kingdom)	*N* = 241 (38.7, 13.3) Male, 134 (51.5)	Psychosis, 121 (50.2) Depression, 120 (49.8)	9.9% met the criteria for digital exclusion Digital exclusion has declined since 2011. Psychosis = 45.9% reported never using social media Depression = 16% reported never using social media	Psychosis sample: Security concerns (45.9%), lack of money (45%), lack of knowledge (40.4%), lack of places to access the Internet (35.8%), lack of availability (33.9%), and not wanting to use it (15.6%) Depression sample: Security concerns (49%) and lack of credit/money (30%).
Shpigelman et al., 2021	Cross-sectional web-based survey	Israel	*N* = 199 Age, N/A Female, 109 (54.8)	Schizophrenia, 58 (29.1) Bipolar disorder, 16 (8) Depression, 12 (6) Anxiety, 5 (2.5) Personality disorders, 7 (3.5) PTSD, 6 (3)	High rates of digital participation among individuals with SMI compared to those without SMI.	N/A

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Spanakis et al. (2021b)	Cross-sectional survey	From Closing the Gap study which was a large clinical cohort of people with severe mental ill health (United Kingdom)	*N* = 367 Age, N/A Male, 187 (51.0) Female, 174 (47.4) Transgender, 6 (1.6)	Psychosis, 188 (51.2) Bipolar, 108 (29.4) Other, 23 (6.3) Not recorded, 48 (13.1)	37.1% were Internet-users. 61.6% were limited or non-users of the Internet. Majority had access to the Internet/digital devices. Half reported knowledge deficits. People with SMI have become more digitally engaged since the pandemic. There is still a wide gap between people with and without SMI. Participants who self-reported a decline in their mental health since the beginning of the pandemic were almost twice as likely to have used the Internet "a lot" during the pandemic.	Lack of interest in using the Internet (28.3%); finding the Internet too difficult to use (27.9%); being concerned about the security of their data and information (24.3%); being worried about their privacy (22.1%); financial barriers (8%); finding the Internet not useful (3.1%).

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Spanakis et al. (2023)	Longitudinal survey	From Closing the Gap study which was a large clinical cohort of people with severe mental ill health (United Kingdom)	*N* = 177 (52.2, 15.1) Male, 89 (50.3) Female, 85 (48.0) Transgender, 3 (1.7)	Psychosis-spectrum disorder, 85 (52.8) Bipolar Disorder, 62 (38.5) Other SMI, 14 (8.7)	42.5% reported experiences of digital exclusion. 54.4% rated their Internet knowledge as fair or worse than fair during the pandemic whilst 34.2% reported that their digital skills had improved during the pandemic. 31.6% indicated that their skills did not improve The sample was found to have generally moderate levels of digital health literacy (self-reported knowledge of the Internet).	Most common were concentration difficulties (62.6%); experiencing depressive episodes (56.1%); easily tired eyes (53.2%). Other barriers: difficulty sitting, paranoia, limb pain, unsteady hands, mania episodes, hearing voices, visual hallucinations and other (fatigue, low motivation, anxiety, migraines, post-stroke symptoms).

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Spanakis et al. (2024)	Cross-sectional survey	From a clinical cohort that participated in the Optimising Wellbeing in Self Isolation (OWLS) study (United Kingdom)	*N* = 249 (51.7) Male: 128 (51.4) Female: 116 (46.6) Transgender: 5 (2.0)	Psychosis-spectrum disorder, 120 (48.2) Bipolar disorder, 83 (33.3) Other, 16 (6.4) Not recorded, 30 (12)	Digital divide between the SMI sample and the general population. 85.9% owned a digital device, 42.2% reported no Foundation Skills, 46.2% lacked skills for daily life, lacking prerequisite knowledge to interact with digital technologies and benefit from their use. People with SMI were twice as likely to experience a deficit in skills (46.2%) compared to the general population (22%). 45.7% did not have the skills that people need to fully benefit from using the Internet and digital devices (EDS) for daily life.	Most problematic areas: Skills deficits (no "Foundation skills"; handling passwords (68.6%) and using device settings to improve usability (61.9%). 17.1% reported not knowing how to turn on a device. No deficiency was reported in Communication, Handling Information, and being safe and legal online.

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Tobitt and Percival (2017)	Cross-sectional survey	Community mental health rehabilitation (United Kingdom)	*N* = 97 (54) Male, 49 (50.5)		Community mental health rehabilitation service-users risk finding themselves excluded by the digital divide. 40.2% had used a mobile phone within 3 months. 59.8% were not mobile phone users. 17.5% had used a computer within 3 months- 82.5% were not computer users 14.4% respondents had used the Internet within 3 months (9 within the last week). Of the 14 Internet users, 8 accessed by computer only, 2 by mobile only, and 4 by both. 85.6% were non-Internet users.	Reasons against mobile-phone use: personal decision over barriers to use. Reasons against computer/internet use: barriers to use more than personal decision. "Decision to not use": they did not want to; felt it unnecessary; and it was too difficult. "Barriers to use": lack of access, and lack of understanding and skills. Individual impairments and cost were rarely cited as barriers. Technology use in this population were substantially less than those recorded in the general UK and other studies in people with psychosis

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Townsend et al. (2016)	Semi-structured interview	Supported community-based housing, urban and suburban communities (United States of America)	*N* = 50 Age, N/A Male, 29 (58.0)	Schizophrenia Bipolar disorder Depression	84% owned cell phones 10% indicated they did not own or have access to a cell phone 58% obtained their cell phones through publicly funded Lifeline assistance programs. Few people owned a computer; most accessed computers and the Internet through public libraries, mental health day programs, or their supported housing facilities. 26% reported daily Internet use, 16% reported using the Internet several times per month.	6% felt no need for a cell phone. Non-use was a matter of mistrust of the technology or concern about the inability to verify the identities of people participating in online interactions. For some, mistrust was intensified because of their lack of knowledge or skill related to the technology. Concerns about privacy and safety were paramount among regular Internet users and those who avoided going online. Concerns were expressed about online content being permanent and not being able to be deleted or erased.

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Table 2 *(continued)*

Study	Study design	Setting (Country)	SMI Sample, N Age (years), M (SD) Gender, *n* (%)	SMI Diagnosis, n (%)	Key findings related to the extent of the digital exclusion	Key findings related to the underlying barriers to digital inclusion
Townsend et al. (2016)					14% reported Internet use a couple of times a month, 20% noted that they went online infrequently, and 24% endorsed they never use the internet. A number of users had their own computers and Internet service at home and thus had regular access.	"Running out of minutes" was associated with disrupted communication and safety concerns; 10% had nonworking/ damaged phones or no money to pay for minutes; Lack of internet skills/ digital knowledge, respondents noted they did not use the Internet because "I don't know how to work it". Many participants relied on their local public library to use a computer, some limiting their use to 30 minutes. Other concerns: negative online social interactions, feeling threatened by others, and not being able to verify the identity of online social contacts.

Note. SSD: Schizophrenia Spectrum Disorders   BPD: Borderline Personality Disorder   OCD: obsessive-compulsive disorder

PTSD: Post-traumatic Stress Disorder   SMI: Serious Mental Illness   N/A: not applicable

Table 2 *(continued)*

Study	Study design	Setting (Country)	SMI Sample, N Age (years), M (SD) Gender, *n* (%)	SMI Diagnosis, n (%)	Key findings related to the extent of the digital exclusion	Key findings related to the underlying barriers to digital inclusion
Välimäki et al. (2017)	Cross-sectional survey	Nine Inpatient units of two psychiatric hospitals (Finland)	*N* = 297 Age, N/A Male, 174 (58.6)	SSDs (F20–29; ICD-10)	55% respondents had computers, and 44% had Internet access at home, however, were not very active users 29% used a computer daily, 24% used the Internet 24% did not use a computer at all, and 33% did not use the Internet. The sample exhibited ~10% lower home Internet access than the general Finnish population.	N/A

Note. SSD: Schizophrenia Spectrum Disorders   BPD: Borderline Personality Disorder   OCD: obsessive-compulsive disorder

PTSD: Post-traumatic Stress Disorder   SMI: Serious Mental Illness   N/A: not applicable

Characteristics of the Studies

The included studies have all been written in the English language and were published in scientific journals, publication dates ranging from 2012 – 2024. The studies were conducted in the United Kingdom, Israel, Finland, Greece, Canada and the United States of America. The majority of studies ($n = 8$) were set in a secondary mental healthcare provider. Four studies were set in urban communities. One study was set in a mental health and addiction services program (Li & Glecia, 2023).

Most quantitative studies were cross-sectional surveys ($n = 8$). Two studies were longitudinal (Robotham et al, 2016; Spanakis et al., 2023). The remaining papers ($n = 6$) were qualitative, of which all were interview studies. The paper by Middle and Welch (2022) additionally used focus groups.

Most papers aimed at examining the use of and attitudes towards digital media. Two papers specifically focused on the COVID-19 pandemic (Spanakis et al., 2021b; Spanakis et al., 2023). Other studies aimed at understanding the digital divide as well as digital exclusion for people with SMI and the impact on health.

Sample

A total sample of $N = 2359$ participants with SMI were included in the 16 studies, sample sizes ranging from 4 to 367 ($M = 147$). The studies included more male ($n = 1247$) than female ($n = 1098$) participants. Three studies included transgender participants ($n = 14$) (Spanakis et al., 2021b; 2023; 2024). The age of participants across all studies ranged from 18 to 84.

Among the 16 included studies, most reported schizophrenia spectrum disorders ($n = 15$). Common were also bipolar disorders ($n = 6$) and depressive disorders ($n = 6$). Anxiety disorders were reported in three papers. Greer et al. (2019) reported on his sample with

Table 3

Summary of Thematic Analysis

Research question	Theme
Extent of the digital exclusion	Comparison to the general population
	Access to digital media
	Extent of use of digital media
	Extent of digital literacy
Underlying barriers to digital inclusion	Lack of digital skills and digital (health) literacy
	Expense
	Impact of mental illness
	Lack of access
	Indifference
	Data security
	Anxiety towards use of digital media

personality disorder ($n = 1$) and eating disorder ($n = 1$). Kozelka et al. (2023) reported partici-

pants with obsessive-compulsive disorder ($n = 2$), post-traumatic stress disorder ($n = 2$) as well

as substance use disorder ($n = 1$).

Research Results

In order to answer the research questions of this review, themes were generated (Table 3).

The Extent of the Digital Exclusion

Carras et al. (2018) reported that the digital divide between people with serious mental

illness and the general population is lessening. In contrast studies by Kozelka et al. (2023) and

Tobitt and Percival (2017) report on a digital divide, where people with SMI are at risk of be-

coming digitally excluded. Robotham et al. (2016) reported that digital exclusion has decreased

over time, but has not disappeared, as 9.9% of the total sample of SMI met the criteria for digital

exclusion. In another study, 42.5% of participants with SMI reported experiences of digital exclusion, despite the use of the internet increasing during the pandemic among people with SMI (Spanakis et al., 2023). Within thirteen papers, four themes were generated to describe the extent of the digital exclusion among people with SMI.

Comparison to the General Population. Five studies compared a SMI sample to the digital behaviour of the general population. Two papers (Spanakis et al., 2021b; Spanakis et al., 2024) reported the seemingly wide divide between those with SMI and the general population in terms of internet use and self-reported internet skills. In contrast, two studies found that Technology access and use were similar to that of the general population (Ennis et al. 2012; Välimäki et al., 2017). Shpigelman et al. (2021) even reported on greater access to technology and higher rates of digital participation among people with SMI compared to a population without SMI.

Access to Digital Media. Eight studies reported on the access to digital media. Two papers reported that the majority of their samples had access to the internet (Athanasopoulou et al., 2017; Spanakis et al., 2021b). In contrast, other papers reported only 34% (Borzekowski et al., 2009) to 44% participants (Välimäki et al., 2017) having internet access at home. In another paper, few people owned a computer, most accessed computers and the internet through public libraries, mental health day programs, or their supported housing facilities. A few users had their own computers and internet service at home and thus had regular access (Townsend et al., 2016). Other papers reported 28% (Borzekowski et al., 2009) owning their own computer, 55 % (Välimäki et al., 2017) reported computer access and even 78% (Ennis et al., 2012) of households owning a PC or laptop.

Mobile phone access was reported by 84% (Townsend et al., 2016) to 91% of participants having access (Ennis et al, 2012). Contrastingly, Kozelka et al. (2023) found that 43% of clients

did not own a smartphone and/or did not have access to the internet at home. Another paper reported 85.9% of participants owning a digital device (Spanakis et al., 2024).

Extent of Use of Digital Media. The use of digital media was reported by seven papers. Tobitt and Percival (2017) reported on 59.8% of participants being non-mobile phone users and computer use ranged from 24% (Välimäki et al., 2017) to 82.5% (Tobitt & Percival, 2017) of participants not using computers.

Participants that reported no use of the internet ranged from 11% to 33% (Athanasopoulou et al., 2017; Townsend et al., 2016; Välimäki et al., 2017), 59% to 61.6% (Athanasopoulou et al., 2017; Carras et al., 2018; Spanakis et al., 2021b) up to 85.6% (Tobitt & Percival, 2017).

In another study, participants that were internet users reported that 36% used the internet just a few times a year (Borzekowski et al., 2009) and Robotham et al. (2016) reported on the use of digital media, where 45.9% of participants with psychosis and 16% of participants with depression reported never using social media.

Extent of Digital Literacy. Six papers reported on the moderate to low levels of digital (health) literacy among people with SMI. Inadequate digital health literacy was referred to as not having the appropriate skills to find, understand and appraise the health information they read online; thus, they could not use this source of health information to deeper understand their illness and use it to develop their self-management skills and further improve their health (Athanasopoulou et al., 2017; Li & Glecia, 2023).

Studies reported from half (Spanakis et al, 2024) up to the majority of participants having a limited understanding of the devices they owned (Kozelka et al., 2023, Spanakis et al, 2021b). In one paper of those reporting a knowledge gap, 59.3% were interested in learning more about the internet (Spanakis et al., 2021b).

The Underlying Barriers to Digital Inclusion

Within fourteen studies, seven key themes were identified regarding the underlying barriers to digital inclusion.

Lack of Digital Skills and Digital (Health) Literacy. The most common barrier to digital inclusion, reported by all studies, was a lack of digital skills or literacy. One paper reported a lack of skills or knowledge as a barrier in 78% of their sample (Borzekowski et al., 2009). Studies reported that up to 27.9% of participants stating the internet being too difficult (Spanakis et al, 2021b; Tobitt & Percival, 2017) reflecting a lack of skills and understanding. Middle and Welch (2022) reported the loss of digital skills when mentally unwell as a barrier as well as the lack of opportunity to learn, use and re-fresh digital skills. Li and Glecia (2023) reported on the lack of knowledge about the benefits that digital technology can bring to improve mental health and wellbeing. Another issue reported by participants was confusion over how to use Web-based services as well as uncertainty regarding how to ask for help in overcoming their digital exclusion (Greer et al., 2019).

Expense. Eight studies reported on expense being an underlying barrier to digital inclusion. This was reported by 30% (Robotham et al., 2016) up to 81% (Borzekowski et al.,2009) of the sample as a barrier to internet use. Greer et al. (2019) mentioned the *perceived* financial barriers, as there was no specification what the sample believed the cost of internet-enabled technology and services to be. In contrast, two studies reported that costs were only rarely cited as barriers (Tobitt & Percival, 2017, Spanakis et al., 2021b).

Impact of Mental Illness. Seven studies reported that the mental health condition of people with SMI, the lack of skills when unwell and their illness related impairments were acting as barriers to digital inclusion. Concentration difficulties were mentioned from 28%

(Athanasopoulou et al., 2017) up to 62.6% (Spanakis et al., 2023), making the internet harder to use. Other commonly reported barriers being easily tired eyes (53.2%) (Spanakis et al., 2023) and problem with typing (55%) (Borzekowski et al., 2009).

Two papers (Greer et al., 2019; Spanakis et al., 2023) reported on mental health specific difficulties as barriers, including depressive episodes, relapses, hallucinations and forgetting how to use the technology. Memory difficulties also hindered previous attempts to overcome digital exclusion and periods of time spent in inpatient care were also reported to be detrimental to participants' awareness of advances in technological development. In another paper, pain was mentioned as a barrier (Athanasopoulou et al., 2017).

Lack of Access. Six papers reported the physical lack of access or equipment fostered digital exclusion (Athanasopoulou et al., 2017; Middle & Welch, 2022; Tobitt & Percival, 2017). A lack of access was reported from 33.9% Robotham et al., 2016) up to 53% (Borzekowski et al., 2009). Townsend et al. (2016) reported on the lack of physical access as a barrier, as many participants relied on their local public library to use a computer, some limiting their use to 30 minutes.

Indifference. Five studies reported on the indifference of their sample to the use of digital media. People with SMI did not want to use technology (Robotham et al., 2016) and felt it unnecessary (Tobitt & Percival, 2017). Another study reported on participants not having the time to engage with digital media and preferring to spend their time with friends and family (Athanasopoulou et al., 2017).

Among the sample, 6% reported on no need for a cell phone, (Townsend et al., 2016), 15.6% not wanting to use the internet (Robotham et al., 2016) and 28.3% reported on a lack of interest in digital media use (Spanakis et al, 2021b).

Data Security. Four papers reported on being concerned about the use of digital media. Papers reported on a general mistrust and apprehension toward digital means (Middle & Welch, 2022; Townsend et al., 2016) as well as security concerns about their personal data being a barrier for 22.1% (Spanakis et al., 2021b) up to 49% (Robotham et al., 2016) of participants. People with SMI expressed concerns about online content being permanent and about not being able to be deleted or erased.

Concerns about privacy and safety were paramount not only among regular internet users but also among those who avoided going online. Here non-use was due to mistrust of technology or concern about the inability to verify the identities of people participating in online interactions (Townsend et al., 2016).

Anxiety towards use of Digital Media. One paper reported that the sample was afraid of breaking the technology or that relatives used it for them (Athanasopoulou et al., 2017). Two papers reported on being overwhelmed with the digital platform (Kozelka et al., 2023; Middle & Welch, 2022). Middle and Welch (2022) reported that their sample had negative experiences online and participants had the perception of digital media as "not for us". Townsend et al. (2016) reported that their sample frequently mentioned concerns about the use of digital media, having experienced negative online social interactions and feeling threatened by others.

Discussion

There are two key findings of the present research. The first being, that the digital divide is lessening (Carras et al., 2018; Robotham et al., 2016; Spanakis et al., 2023) but has far from disappeared (Kozelka et al., 2023; Tobitt & Percival, 2017). Studies have shown how difficult it is to overcome the digital divide (Robotham et al., 2016) and the extent of the divide, despite the

use of the internet increasing during the pandemic among people with SMI (Spanakis et al., 2023).

The results of this research provide conflicting evidence in how people with SMI are experiencing the digital divide compared to the general population. Whilst two papers (Ennis et al., 2012; Välimäki et al., 2017) report both populations to be quite similar, more recent studies (Spanakis et al., 2021b; Spanakis et al., 2024) have not been able to replicate these findings, reporting a wide divide. These recent changes should be seen in light of the recent COVID-19 pandemic. Beyond the COVID-19 pandemic, other developments in recent years could explain an increase in digital media use such as the rapid development and adoption of new technologies and digital services, including telehealth, online education, and social media platforms, making internet use more essential.

The second key finding of this review is the interlace of multiple barriers preventing digital inclusion among people with SMI. The most prominent barrier reported was inadequate digital literacy among the studied population. A recurring theme among the studied literature was the discrepancy between access to and the use of digital media being highlighted. The findings of this review suggests that a lack of use might be a more significant barrier than lack of access, which has been discussed by previous researchers (Van Deursen & Van Dijk, 2011). Ownership of devices does not imply baseline knowledge of technology among people with SMI (Kozelka et al., 2023). Despite high ownership rates, many use their devices only for basic tasks, which does not mitigate digital exclusion (Spanakis et al., 2024).

One reasoning, as to why there is limited use of technology despite access to technology is that of digital literacy. All of the included studies agreed on low digital literacy among people with SMI, suggesting that proficiency and skills are greater sources of disparities than access

alone (Van Deursen & Van Dijk, 2011). Li and Glecia (2023) similarly argued that a lack of knowledge about the benefits of digital technology hinders experiencing its advantages. They found that inadequate digital health literacy prevented participants from understanding the benefits of digital technology for mental health.

Access to technology was most prominently an issue associated with low income (Townsend et al., 2016) which aligns with findings of the general population, where the main reason low-income families do not have access to technology is because they cannot afford it (Rideout & Katz, 2016). Borzekowski et al. (2009) reported this barrier among half of their sample of people with SMI and several studies highlighted that low-income people with SMI struggle with access to technology (Kozelka et al., 2023; Li & Glecia, 2023; Townsend et al., 2016).

In their research, Howard et al. (2010) have found that certain communities and individuals are disproportionately affected by the digital divide, such as those with low income which is in line with findings by Sood et al. (2016, as cited in Li & Glecia, 2023) that report on how income directly predicts internet access and utilization. Given the economic and social landscape, it is expected that patients with mental health disorders are often considered low-income earners, having higher rates of unemployment (Hoedeman, 2012 as cited in Li & Glecia, 2023) and it is known that individuals with SMI have an impaired ability to work and are likely to have their total income mostly constituting of transfer payments (Hakulinen et al., 2020).

Expense was frequently mentioned as a barrier to digital inclusion. Participants reported that material deprivation or a lack of money hindered engagement with internet-enabled technology. Greer et al. (2019) noted that individuals might overestimate technology costs due to a lack of knowledge. Whilst an optional solution might be the temporary or permanent provision of digital devices, one needs to consider the number of individuals requiring such support. Robotham

et al. (2016) imply that providing devices alone may not facilitate inclusion, as first-time users might find them daunting, reflecting issues of digital literacy.

Mental health impairments such as cognitive difficulties (Borzekowski et al., 2009; Middle & Welch, 2022; Spanakis et al., 2023) were often reported as reasons against the use of digital means. Cognitive impairment affects an individuals' awareness, memory, ability to learn and process information and make decisions, making interacting with information technologies exceptionally frustrating. Most individuals with cognitive disabilities report that the time it takes to learn to use information technologies is prohibitive and the complexity of the technologies can be overwhelming (Bodine, 2005). When dealing with the population of SMI, cognitive abilities and impairments is of major importance to consider.

Although indifference towards digital media was noted as a barrier, with some participants feeling it unnecessary (Athanasopoulou et al., 2017; Spanakis et al., 2021b; Tobitt & Percival, 2017) or simply had a lack of interest (Spanakis et al., 2021b; Tobitt & Percival, 2017), these were a minority in most studies. The distinction between underlying barriers such as lack of knowledge or mental health impairments feeding peoples' indifference and *true* indifference as a barrier to digital inclusion is important. Furthermore, the question arises, whether in light of true indifference, there is then a true need to close the gap.

One should keep in mind another possible underlying barrier, such as a lack of confidence or lack of knowledge about benefits beneath such indifference (Li & Glecia, 2023). Participants in a reviewed paper (Spanakis et al., 2021b) reported that technology was "too difficult" to use, where one might argue that this category reflects a lack of confidence of people with SMI in handling technology.

Greer et al. (2019) similarly reported on peoples' confusion over use and uncertainty about seeking help in overcoming their digital exclusion, indicating that shame might mediate the relationship between lack of skills, confusion and use of digital media. Researchers have long known that people suffering from SMI do experience stigma both off- and online which can lead to shame and low confidence. This is supported by the findings of the present review. People with SMI reported on negative experiences online, such as being threatened or experiencing prejudice and having the perception of "not for us".

The topic of stigma further emerged in this review, in light of data security concerns and a general apprehension towards digital media. People with SMI expressed concerns about the permanence of online content and privacy issues. A non-use as a matter of mistrust is intensified by a lack of knowledge, or skills related to the technology (Townsend et al., 2016), however concerns about privacy and safety were paramount not only among regular internet users but also among those who avoided going online.

Strengths and Limitations of the Review

To the best of the researchers' knowledge, this study is among the first to summarise and provide an overview of the extent of digital exclusion and underlying barriers to digital inclusion among people with SMI.

There are at least three potential limitations concerning the results of this study. A first limitation concerns that the research was carried out by a single researcher. The researcher's interpretation of the data may be influenced by their personal biases leading to subjective judgments and potentially skewed results. To combat this limitation, the screening process was computer-assisted using the Covidence software. Nonetheless, without multiple researchers independently

coding the data, there is a higher risk of error during data extraction. The researcher may have overlooked relevant studies or failed to extract all pertinent information.

Due to resource constraints concerning time and costs associated with obtaining and translating studies, the review exclusively considered studies published in the English language. While some researchers employ machine-generated translations, such as those provided by Google Translate, for this thesis, such translations were deemed inadequate in ensuring a level of accuracy comparable to professionally generated human translations (Freitag et al., 2021). Whilst English has become the universal language of science (Fung, 2008), research papers relying exclusively on English-language studies may be biased (Morrison et al., 2012). The aim of a scoping review to identify the extent, range and nature of literature might be compromised by the selection of studies in the English-language only, which is known as the "English-language" bias (Egger et al., 1997). This decision raises concerns about the potential lack of inclusivity and generalizability in the findings.

The third limitation noteworthy to mention, is that scoping reviews hold potential for bias (Grant & Booth, 2009) as a systematic assessment of methodological limitations of literature is not performed (Arksey & O'Malley, 2005). Scoping reviews typically do not include a quality assessment of limitations or bias and conclusions drawn might be impacted by their lack of quality. This decision raises concerns about the potential lack of validity and generalizability in the findings. Nonetheless, this methodology was chosen in order to provide a complete overview of the existing literature in the given field of interest.

Implications and Recommendations for Mental Health Practice

Despite these limitations, the results of the present review suggest several practical implications. Taken together, these findings highlight the need for policy makers to focus on digital

inclusion initiatives among the studied population. To assist people that want to increase their knowledge as well as spread awareness among the population that is characterised by unawareness or an indifference towards the benefits of the digital world, extensive training and programs are needed.

The lack of knowledge and familiarity to the digital world leading to the overestimation of expense or indifference or data security should be addressed, especially in people isolated from technological developments in inpatient services. Here, the researcher similarly argues for the need of training in basic skills. Another suggestion is the provision of supervised access to technologies and services during periods of inpatient treatment to prevent these gaps arising. Additionally, individuals with economic difficulties should be informed about free resources of internet-enabled technology and services e.g. libraries (Greer et al., 2019). There should be a focus on the provision of free or discounted hardware, software, and instruction as well as mental healthcare services. Here, the active involvement of policy makers, private industry, and mental health and other community service providers is needed (Townsend et al., 2016).

Directions for Future Research

This review has shed light upon a gap in literature concerning the impact of the digital divide and digital exclusion on people's mental illness. Solely one paper (Middle & Welch, 2022) talked about the direct and indirect manner in which the digital divide impacts the (mental) health of people with SMI. In terms of future research, current findings must be extended by examining the consequences of the digital divide on people's mental health symptoms.

It is substantial to understand the impact of mental health symptoms such as hallucinations and poor memory on an individual's ability to retain acquired skills in the future. Future research should focus on designing programs that consider the special needs of people with SMI that may

facilitate both short- and long-term digital inclusion (Greer et al., 2016). Furthermore, research should focus on the assessment of the effectiveness of such programs in improving digital skills.

Lastly, in light of the findings of this review, research should focus on the relationship between different underlying barriers of the digital divide. Specifically, researchers should focus on the impact of digital literacy on people's sense of security, indifference and financials.

In conclusion, this scoping review has highlighted the persistent digital divide among people with serious mental illness, underscoring that whilst access to digital technology has improved, significant barriers remain, particularly in digital literacy. The review identified that an interplay of barriers such as a lack of digital skills, financial constraints, cognitive impairments, mistrust of and anxiety towards technology are contributing to the digital exclusion of people with SMI. Despite increased ownership of digital devices, these barriers prevent many individuals with SMI from fully engaging with digital media. The findings of this review emphasise the need for targeted interventions, including comprehensive digital literacy training and supportive measures to enhance digital inclusion for people with SMI. Future research should explore the specific impact of digital exclusion on mental health and evaluate the effectiveness of tailored digital inclusion programs. Much work remains to be done before a complete understanding of the digital divide among people with SMI is established and the gap is closed.

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Note. Papers marked with * are review papers.