J-Kesmas: Jurnal Fakultas Kesehatan Masyarakat p-ISSN: 2355-0643, e-ISSN: 2355-0988
(The Indonesian Journal of Public Health) Vol. 12, No. I, April, 2025
Available at http://jurnal.utu.ac.id/jkesmas Open Access TYPE OF ARTICLE

The Utilization of Digitalization in Mental Health Screening: Literature Review

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Submitted:06/03/2025 **Revised:** 18/03/2025 **Accepted:** 12/04/2025 **Published online**: 28/04/2025

doi: https://doi.org/10.35308/j-kesmas.v12i1.11652 **How to cite this article**: Farida, N., Adisasmoto, W. 2025. The Utilization of Digitalization in Mental Health Screening: Literature Review. *J-Kesmas: Jurnal Fakultas Kesehatan Masyarakat (The Indonesian Journal of Public Health)*. 12 (1): 25-34

Abstract

Background: Mental health disorders are one of the contributors to public health problems. Delays in providing mental health services are a major problem in treatment, which is caused by negative stigma from society if someone seeks mental health services. Digitalization in mental health screening is one way that makes early detection of mental health easier. This paper reviews scientific evidence regarding the use of digitalization in mental health screening. **Method**: This study used the Scopus, ProQuest, PubMed, and Scholar databases (2019-2025) with the keywords digitalization, mental health, and screening. Of the 2596 articles found, only 9 were relevant after screening. **Results**: Utilization of mental health digitalization can help in early detection and prevent delays in providing mental health services. However, in its use, there are obstacles so that the application is less popular with the public, namely related to lack of trust in the security of personal data in the application, complexity in access, and content that users do not understand. **Conclusion**: The use of digitalization in mental health screening is an innovation that can improve mental health services, but collaboration from various scientific fields is needed to pay attention to the needs and abilities of users from various aspects.

Keywords: Digitalization; Mental Health; Screening.

Background

According to WHO data for 2024, more than 720,000 people die by suicide each year, which is the third leading cause of death among 15–29-year-olds. In fact, nearly three-quarters (73%) of global suicides occurred in low- and middle-income countries in 2021(WHO, 2022b). Based on the 2023 IIS data, the prevalence of households that have a household member with Psychosis/Schizophrenia Mental Disorder based on symptoms is 4% and based on symptoms and diagnosis is 3%. The proportion of households with a household member with psychosis/schizophrenia who had been shackled was 6.6% and 25.2% of households with a household member who had been shackled in the past 3 months (Riskesdas, 2023).

In May 2012, the 65th World Health Assembly (WHA) adopted resolution WHA65.4 on the global burden of mental disorders and the need for a comprehensive and coordinated response from the health and social sectors at the country level, one control of which is early detection by the implementation of screening programs (WHO, 2021). Screening aims to identify people in the population who appear healthy but are at higher risk of a particular health problem or

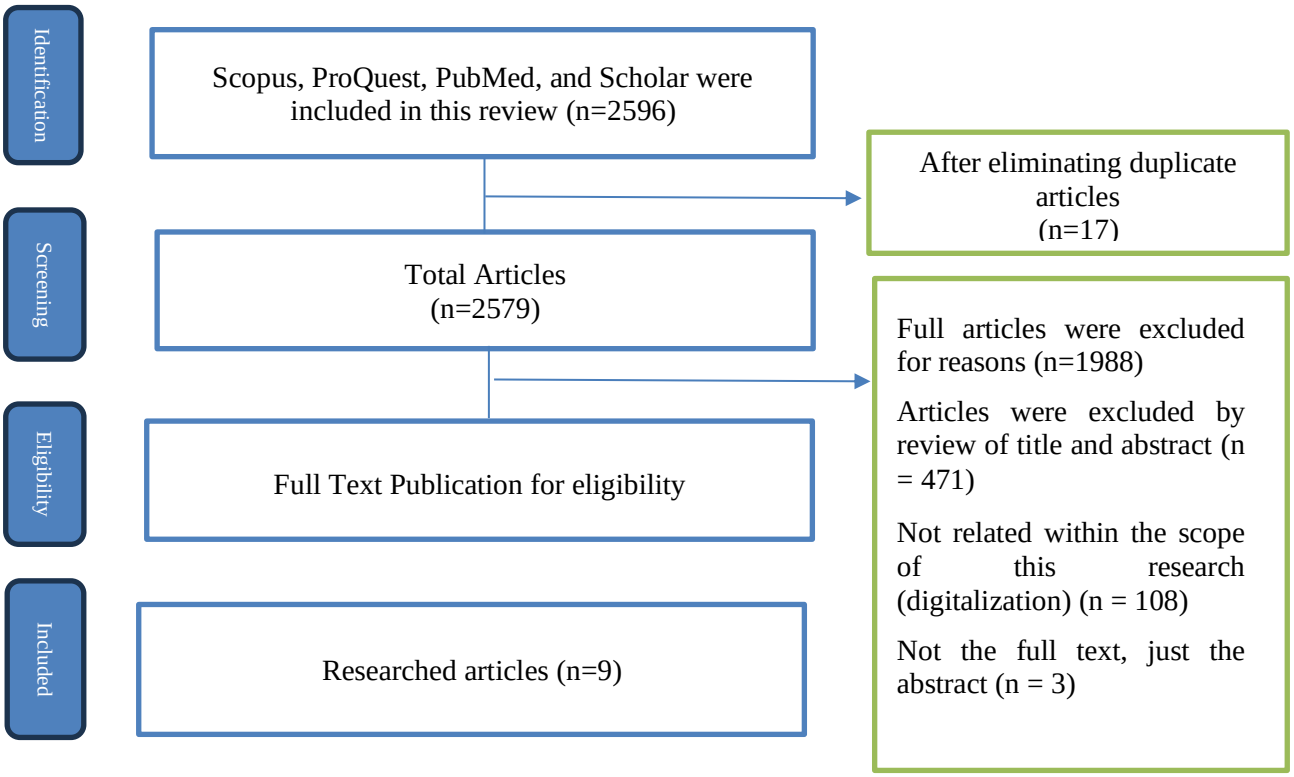
condition (World Health Organization, 2020). Based on the Decree of the Ministry of Health No. HK.01.07/Menkes/2015/2023 concerning Technical Guidelines for Primary Health Care Integration that the implementation of primary health care is carried out in an integrated manner at health center, networks and primary health care networks to meet health care needs at every phase of life, including the implementation of mental health screening (Ministry of Health Republic Indonesia, 2023).

Mental disorders involve significant disturbances in thinking, emotions, or behavior, causing distress or impaired functioning. They are also called mental health condition (WHO, 2022a). Stigma, lack of knowledge, the belief that their condition is normal, and difficulty accessing care prevent many people with mental disorders from seeking help. (Choresyo et al., 2015). Leveraging the use of digitization in mental health screening on mobile apps can help provide timely support, reduce the cost of mental health care, address stigma in help-seeking, and improve treatment outcomes (Koh & Tng, 2022). Digital mental health interventions offer an opportunity to reduce mental health disparities among marginalized populations by overcoming traditional barriers to care and providing quality mental health services (Schueller et al., 2019). Symptoms of mental health disorders are sometimes not obvious, and many people hide them out of shame and fear to avoid being stigmatized by society. Stigma associated with mental health leads to delays in seeking help, reduced access to health services, suboptimal care, poor outcomes, and increased risk of human rights violations (Javed et al., 2021). Prevention and the role of the community in optimizing the mental health functioning of individuals are effective strategies to solve current mental health problems (Ayuningtyas & Rayhani, 2018). This study aims to provide an overview of the use of digitalization in mental health screening in order to improve access to comprehensive mental health services for the community.

Method

This research uses the literature review method, namely a study approach that aims to analyze and compile various relevant literature using the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) method with the aim of reaching a conclusion or new idea. The journals that will be used in this research are data sources that focus on certain topics (Page et al., 2021). There are 3 (three) categories of keywords used, namely mental health, screening and digitalization (Javed et al., 2021; Koh & Tng, 2022; Schueller et al., 2019). Searches for scientific journals were carried out through online databases including Scopus, ProQuest, PubMed, and Scholar with a period of 2019-2025.

Chapter 1. Study flow based on PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis)



Result

The following are selected journals that researchers analyzed in the literature review study, which is shown in Table 1.

Table 1. Article search results

No	Author, Year and Place of Research	Research Title	Method	Population and Research Sample	Research Objectives and Results	Tools
1.	Sophia Furtjes et al, 2024, Germany	Characteristic of mental health app usage: a cross-sectional survey in the general population	Cross Sectional Study	People aged over 16 years	Objective: to provide information on the current status of Mental Health Application (MHA) use in the general population in Germany, characteristics of MHA users, and use of and barriers to (continued) MHA use. Results: The use of anxiety, depression, and stress sufferers reported using the Mental Health Application (MHA) application was higher, so it was concluded that the MHA application could reach the target population. Meanwhile, the obstacle is that there is distrust in the security of personal data from using the application.	Mental Health Application (MHA)/ self-screening app
2.	Diogo Nogueria-Leite et al, 2024, Portugal	Individuals' attitudes toward digital mental health apps and implications for adoption in Portugal: web-based survey	Cross Sectional Study	University students	Objective: to understand individual attitudes towards DMHA in the Portuguese context. Participants were asked about perceived benefits, barriers to adoption, and potential ways to support DHMA adoption. Results: benefits in terms of use really help the need for mental health services. Meanwhile, the obstacle is that in its development it should be given sustainable and timely treatment.	Digital Mental Health Application (DMHA)/ self-screening app

3.	Min K Chong et al, 2023, Australia	Digital Application of Clinical Staging to Support Stratification in Youth Mental Health Services: Validity and Reliability Study	Cross Sectional Study,	People aged between 16 and 25 years	Objective: to assess the validity of a digital algorithm to accurately assign a person to stage 1a (requiring low-intensity intervention) or stage 1b+ (requiring moderate to high-intensity intervention). Results: This study shows that digital algorithms can differentiate individuals in the early stages of mental illness (stage 1a) from those at higher risk of disease progression or more advanced syndromes (stage 1b+). Validation of this tool provides support for further evaluation and use in stratification services, which may help youth mental health services to reduce unnecessary delays in assessment and treatment and improve the quality of care.	Innowell (digital algorithm/self-screening app)
4.	Kwangsu Cho et al, 2024, South Korea	Digital Phenotypes for Early Detection of Internet Gaming Disorder in Adolescent Students: Explorative Data-Driven Study	Multiple Logistic Regression with bootstrapping and multivariate ANOVA test	Teenagers aged 13-14 years old.	Objective: to uncover digital phenotypes for early detection of Internet Gaming Disorder (IGD) among adolescents in learning environments. By utilising sensor data collected from student tablets. Results: digital phenotyping can be a promising early detection method for IGD. This approach may change the clinical approach from reactive measures to proactive measures.	Phenotype Digital

5.	Lagu Sunmi et al, 2023, South Korea	Digital Phenotyping of Geriatric Depression Using a Community-Based Digital Mental Health Monitoring Platform for Socially Vulnerable Older Adults and Their Community Caregivers: 6-Week Living Lab Single-Arm Pilot Study	RCT	Elderly people over 65	Objective: to determine whether digital sensing data or digital phenotypes on heart rate variability, sleep quality, and physical activity can predict same-day or next-day depressive symptoms among socially vulnerable adults in their daily living environment. Results: that older adults showed improvements in depressive symptoms and sleep quality following the use of a monitoring platform, which was integrated with existing community care services. These findings offer initial support for digital phenotyping of geriatric depressive symptoms using sleep measurements obtained from wearable sensors.	Phenotype Digital
6.	Emily G. Lattie et al, 2022, United States of America	Uptake and effectiveness of a self-guided mobile app platform for college student mental health	RCT	University students	Objectives: to determine the impact of implementing IntelliCare for university students on the utilization of campus counselling services; and examine the impact of using the program on depression and anxiety symptoms, mental health literacy, knowledge of mental health care services, and the perceived benefits and frequency with which participants use cognitive and behavioral coping skills. Results: mental health apps can provide university students with additional tools to support their mental health and wellbeing that are easily accessible and offset some of the barriers associated with face-to-face services.	IntelliCare for College Students (self-screening app)

7.	Catharina Gruneberg et al, 2025, Germany	Medical Students' Acceptance of Tailored e–Mental Health Apps to Foster Their Mental Health: Cross-Sectional Study	Cross Sectional Study	The medical students	Objective: to examine the uptake of mental health digital apps among medical students. Results: There was a high uptake of apps among medical students, and high anxiety symptoms were detected among students who also worked part-time.	eHealth (self-screening app)
8.	Diana Frasquilho et al, 2021, Portugal	Protocol for the Implementation and Assessment of "MoodUP": A Stepped Care Model Assisted by a Digital Platform to Accelerate Access to Mental Health Care for Cancer Patients Amid the COVID-19 Pandemic	RCT	Cancer patients above 18 years old.	Objective: to describe the implementation and patient acceptance of the screening and treatment system on the MoodUp app. Results: a digital platform-assisted collaborative care system (MoodUp) that is an innovative mental health screening for cancer patients, focussed on diagnostic and treatment solutions to improve their quality of life	MoodUp (self-screening app)

9.	Andra Iona Maria Tudor et al, 2022, Romania	Challenges in the Adoption of eHealth and mHealth for Adult Mental Health Management— Evidence from Romania	RCT	Adults over the age of 18 and experts in the field of mental health.	Objective: to accurately identify attitudes and behaviours regarding the use of eHealth and mHealth to prevent mild mental disorders, such as depression and anxiety, and to profile Romanian healthcare consumers. Results: the use of digital apps in mental health screening can be very helpful in the initial determination of diagnosis, avoiding specialised mental health-related assessments due to stigma is greatly helped by these apps. Fear or embarrassment of being judged or categorised as 'crazy' was the main reason for their lack of action for face-to-face mental health screening and services.	eHealth dan mHealth (self-screening app)

Discussion

Difficult access to health services is a major obstacle to mental health screening, the problem is not only related to location or financing, but also related to shame and fear of being considered 'crazy' by their environment (Ioana et al., 2022). The development of technology in its use can be a promising solution to solving problems in the health sector. Digital technologies, like telemedicine and mobile health applications, enhance public health access, overcoming geographical barriers and requiring digital literacy for effective utilization (Adinda et al., 2024).

Currently, many applications have been developed for mental health screening in various countries that utilize applications on mobile phones with self-screening methods, digital algorithms and also digital phenotypes. Since December 2024, the Satu Sehat application has been used in our country for independent mental health screening using the World Health Organization's standard questionnaires, the Strength and Difficulties Questionnaire (SDQ) for users aged 10-17 years and the Self Reporting Questionnaire (SRQ) for users aged 18 and above (Ministry of Health Republic Indonesia, 2024). Each country has its own name and method, in Portugal there is MoodUp (developed for cancer patients) and Digital Mental Health Application (DMHA); in Germany there is eHealth and Mental Health Application (MHA); in Romania there is eHealth and mHealth; in the United States there is IntelliCare for College Students, which is intended specifically for students; and in Australia there is Innowell, which is a development of digital algorithms (Chong et al., 2023; Frasquilho et al., 2021; Fürtjes et al., 2024; Grüneberg et al., 2025; Ioana et al., 2022; Lattie et al., 2022). As with the self-reported mental health screening method on mobile phone apps, there is another promising method that uses digital phenotyping. Digital phenotyping is the quantification of behavioral data from each individual over time, which is usually collected passively from mobile phones or other sensor devices, as developed by South Korea in monitoring children's excessive use of mobile phone games and predicting depression in the elderly (Cho et al., 2024; Song et al., 2024).

Considerations for the use of digital mental health screening can be community-specific. For example, the elderly, who have barriers to the use of mobile technology, are required to complete many questions in the mental health screening form. The most appropriate way to screen is the digital phenotyping method, which uses sensors that monitor heart rate variability, sleep quality, and physical activity that can predict symptoms of depression. It was found that mental health screening through sleep quality can be used to predict daily fluctuations in depressive symptoms, so that families can act quickly before further problems occur (Song et al., 2024).

Similar to mental health screening in children, the problem of online gaming addiction or Internet Gaming Disorder (IGD) is also one of the major problems today (Novrialdy, 2019). Teenagers tend to enjoy online game addiction and have no awareness of the problem, the social stigma felt by parents who have children with the disorder, can also be one of the obstacles to further screening and treatment. So in a study conducted by Kwangsu Cho et all, using digital phenotyping to detect the presence of IGD by utilizing sensor data collected from student tablets (Chong et al., 2023).

Self-reported health screening, which generally uses the Self Reporting Questionnaire (SQR) form, can now be easily done through an app on a mobile phone. This method has been widely adopted by various countries (Beiwinkel et al., 2017). In a study conducted on Sophie Furtjes et al, that in her research, produced data that 41% had used MHA for 12 months that had been detected for anxiety, depression and stress, the rest stated that there were doubts about the use of the application, due to distrust, lack of perceived need, and personal data security issues, which were barriers to the implementation of MHA (Fürtjes et al., 2024). Similarly, a study conducted in Germany by Catharina Gruneberg et al.

used data from a population of medical students who are vulnerable to mental health disorders due to their hectic activities. It was found that mental health disorders can be detected in students who do part-time work in addition to their activities as students, so it can be stated that eHealth applications can be an alternative to early detection of mental health disorders in communities that are difficult to reach health services (Grüneberg et al., 2025). Similar to Catharina Gruneberg et al research on medical students, Emily G. Lattie et all's research also examined the student population in the United States, on the IntelliCare for College Students application which is also an application on mobile phones in self-screening. The study found that the app could support their mental health and speed up delays in their mental health care actions (Lattie et al., 2022).

A study conducted in Portugal by Diogo Noguaria et al, that screening mental health through an application on mobile phones called Digital Mental Health Application (DMHA) found that 169 people (31.4%) out of 539 samples had used this application. In his research, it was stated that stigma and the need to seek mental health services did not have a significant influence on the use of mental health digital applications. Similarly, in a study conducted by Sophie Furtjes et al. (2024) in Germany, distrust of the security of personal data was a concern that led to a lack of interest in the use of the application (Leite et al., 2024). Another case in research on Diana Frasquilo et al., which was also conducted in Portugal. This research is an innovation from the difficulty of face-to-face monitoring of cancer patients during the COVID-19 pandemic. The MoodUp application is a development carried out by health services in order to improve the health service process for mental health care collaboratively with the field of oncological health. So it is hoped that health services can provide holistic health services that can improve their quality of life. In the study, it was found that good application utilization in cancer patients and mental health disorders could be detected in users, but not all used the application regularly; further education was needed so that cancer patients could make good use of it (Frasquilho et al., 2021).

In the research of Min K. Chong et al in Australia, in his research on adolescents aged 16 to adults aged 25 years. Aiming to find out whether the use of the Innowell application can assess the validity of digital algorithms to accurately place a person into stage 1a (requires low intensity intervention) or stage 1b + (requires moderate to high intensity intervention). The results showed that the app was able to demonstrate that the digital algorithm could distinguish individuals in the early stages of mental illness (stage 1a) from those at higher risk of disease progression or more developed syndromes (stage 1b+) based on a web-based multidimensional self-report assessment (91% accuracy; K=0.67). The validation of this tool provides support for further evaluation and use in stratified services, which may help adolescent mental health services to reduce unnecessary delays in assessment and treatment, and improve quality of care (Chong et al., 2023).

Another thing with the research conducted in Andra Ioana Maria et al. Research conducted in Romania on the general public over the age of 18 and experts in the field of mental health, namely general practitioners, psychiatry, clinical psychologists, and experts who know the capacity of consumers and health service providers (hospitals, health offices, and health clinics). The research found that digital mental health can reduce the stigma that exists so that users can easily utilize the application and accelerate the delivery of mental health services (Ioana et al., 2022). However, many people have not been able to take advantage of it in the research obtained that is considered to increase a person's chances of utilizing the application, namely accessibility (ease of accessing and using the application), security of personal data, and content that is easy to understand. In overcoming these obstacles, application development requires collaboration

across scientific fields, namely collaboration in engineering, computer science, ethics, anthropology, business, psychology, and medicine as the main domain. Thus, it can fulfil all aspects needed by the community in the ease of application utilization (Mohr et al., 2017).

Conclusion

Digitalization in mental health screening can greatly assist in the early detection of mental health disorders, avoiding delays in the delivery of mental health services. The fear of being negatively stigmatized by the public may be avoided, but other questions arise when there is distrust due to weak security of personal data, difficulty in accessing complicated applications, content that is less understandable to ordinary people, and people do not feel the importance of awareness of maintaining mental health. It is necessary to collaborate across scientific fields apart from medicine, including engineering, computer science, ethics, anthropology, business, psychology, and other sciences required in application development. By paying attention to various aspects that can adjust the needs and abilities of users of the digitalization of mental health screening. In addition, health promotion related to the importance of early detection of mental health is also very important, so that people can realize the importance of maintaining mental health and can reduce bad stigma in the community. In the use of digitalization, the selection of methods or tools should be chosen according to the ability and needs of the user. For example, in the elderly, digital phenotypes are appropriate to use due to their limited ability to access applications on mobile phones. The suggestion for future researchers is to further explore how the use of digitalization of mental health screening can be integrated into mental health service facilities so that mental health services can be carried out continuously and prevent delays in mental health services.

Limitations

This study has many limitations, as there are not many journals that review the specific use of certain types of digitalization or applications in mental health screening.

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