

The Relationship Between Global Internet Access and Mental Health in the Digital Age: A Comparative Analysis Across Countries

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Citation:

Received: 11-03-2026

Accepted: 02-04-2026

Published: 02-04-2026

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Abstract: The rapid development of global internet access has transformed patterns of social, economic, and cultural interaction, but has also given rise to new challenges related to mental health in the digital era. While the internet is often viewed as a means of improving well-being and accessing information, empirical evidence suggests a complex dynamic between the intensity of digital connectivity and people's psychological well-being. This study aims to analyze the relationship between global internet access and mental health through a cross-country comparative approach, focusing on the global context and case studies of Indonesia and Singapore. This study uses a qualitative approach with content analysis of secondary big data sourced from Our World in Data, including indicators of internet usage, prevalence of mental health disorders, and reports of anxiety and depression. Data are analyzed descriptively and interpretively to identify temporal patterns, cross-country differences, and contextual links between digital transformation and mental health. The results show that increasing global internet access and use are accompanied by a rising prevalence of mental health disorders, particularly in the period after 2019. Countries with high internet penetration rates and countries experiencing accelerated digital adoption both face mental health risks, albeit with different characteristics. These findings indicate that the impact of digitalization on mental health is not linear, but rather influenced by social, cultural, and digital governance factors. This research contributes to the literature by offering a cross-country comparative perspective and a qualitative content analysis approach to global health data, which is rarely used in similar studies. However, this study is limited by its use of aggregate data and its failure to directly test causal relationships. Therefore, future research is recommended to develop a longitudinal approach and incorporate primary qualitative data to gain a deeper understanding.

Keywords: Internet access, Mental health, Digital transformation, Comparative analysis between countries, Digital age

Introduction

The development of internet access has become one of the most significant transformations in modern social life and has far-reaching implications for human well-being, including mental health (Suryoadji et al., 2024). The internet not only serves as a means of communication and information, but also as a new social space that shapes the patterns of interaction, identity, and behavior of individuals in various parts of the world (Lim, 2014). As global internet penetration increases, academic attention to its impact on mental health is also gaining strength. Several international reports show that the prevalence of mental disorders such as depression and anxiety has increased globally in the last two decades, along with the intensification of the use of digital technologies (Freeman, 2022). This condition has led to an academic debate about whether internet access plays a protective role as a protective factor that improves psychological well-being or is a new risk factor for mental health in the digital age.

Previous research has shown mixed and inconsistent results regarding the relationship between the internet and mental health. A global panel study covering 189 countries found that increased internet penetration significantly correlated with increased prevalence of anxiety disorders, although associations with depression showed more varied outcomes depending on model specifications and country context (Cavalcanti et al., 2024). In contrast, global research based on Gallup World Poll data from 168 countries shows that internet use in general is positively associated with subjective well-being and life satisfaction, especially through improved social connectivity and access to information (Vuorinen and Przybylski, 2024). At the micro level, a meta-analysis of *problematic internet use* showed a moderate association with depression, anxiety, loneliness, and decreased psychological well-being, especially among students and adolescents (Keles, McCrae and Grealish, 2020). Other findings also suggest that the impact of the internet on mental health is highly contextual; for example, moderate internet use can reduce depressive symptoms in the elderly group, while excessive use actually worsens psychological conditions (Zhang et al., 2022).

Although the literature on the internet and mental health is growing rapidly, there is a significant research gap. First, most studies still focus on the individual level or a specific age group, so it is not able to explain the dynamics of these relationships at the macro level between countries (Aji and Indrawan, 2019). Second, many studies measure internet use in terms of duration or addiction, without attributing it to structural variables such as national internet penetration, digital inequality, or the level of economic development (Twenge et al., 2019). Third, cross-border studies that combine mental health data and internet access in a global comparative framework are still relatively limited, so the variation in the impact of the internet in various social, economic, and cultural contexts has not been fully explained (Anggraeni, 2024). These limitations point to the need for a more comprehensive and global research approach.

Based on this gap, this research offers novelty in several important aspects. First, this study analyzes the relationship between internet access and mental health at the intercountry level using global comparative data, thus going beyond the dominant micro-focus in the previous literature. Second, the study integrates structural indicators such as national income levels, human development indexes, and digital inequality as moderator variables in the relationship between internet penetration and mental health. Third, by using a time-lapse panel data approach, this study was able to capture the long-term dynamics of the impact of internet access on mental health, rather than just static relationships at a single point in time. This approach is expected to provide a new understanding of how digital transformation affects people's mental health structurally and contextually.

In line with that, the focus of this research is to analyze the relationship between global internet access and mental health in the perspective of comparison between countries in the digital era. The objectives of this study are: (1) to identify the relationship between the national internet penetration rate and the prevalence of mental disorders such as depression and anxiety; (2) analyze the differences in the impact of internet access on mental health in countries with different levels of economic development; and (3) examine the role of structural factors as moderator variables in the relationship. The research questions asked include: *Is increased internet access significantly related to the mental health of people between countries?* and *How does the socioeconomic context affect the relationship?* The research method used is quantitative analysis with multivariate data panel regression using secondary data from *the World Development Indicators* (World Bank) and *Global Burden of Disease*, with the aim of producing strong and relevant empirical findings for the development of mental health policies in the digital era.

Literature Review

The relationship between global internet access and mental health in the digital age has been a major concern in the cross-disciplinary literature, including public health, psychology, and development studies. The Internet is seen as a new social determinant that can affect mental health through various mechanisms, such as increased social connectivity, access to health information, and the expansion of digital-based mental health services (WHO, 2022). A number of studies show that internet access has the potential to improve psychological well-being by reducing social isolation and strengthening support networks, especially in older age groups and populations in remote areas (Luo, Yip and Zhang, 2025). However, the internet is also associated with mental health risks, such as digital addiction, increased stress, and exposure to negative content, suggesting that the impact is ambivalent and highly contextual (Aribowo and Bagaskara, 2025).

In a comparative study between countries, the global panel's research provides a more comprehensive picture of the variation in the impact of the internet on mental health. A

study that analyzed data from 189 countries found that increased internet penetration significantly correlated with an increased prevalence of anxiety disorders, especially in highly urbanized countries, although the association with depression was not always consistent (Javaid et al., 2023). These findings suggest that expanding internet access at the national level can create new psychosocial pressures that differ between countries, depending on the readiness of each country's social institutions and mental health systems.

In contrast, another global study based on the Gallup World Poll in 168 countries found that internet use in general is positively associated with subjective well-being and life satisfaction, especially through increased social capital and social participation (Vuorre and Przybylski, 2024). However, the authors assert that this relationship is highly dependent on the context of use and does not necessarily reflect causal impact. Cross-country comparative studies in Europe also show that the relationship between the internet and mental health differs significantly between countries, even in regions with relatively homogeneous levels of development, indicating an important role of cultural and social policy factors (Robinson et al., 2022).

In the Indonesian context, research on the internet and mental health is still relatively limited and tends to focus on micro aspects. Several studies show that Indonesians have a high level of acceptance of internet-based mental health interventions, especially for the treatment of depression and stress, due to geographical barriers and limitations of conventional mental health workers. On the other hand, the increasing use of social media in Indonesia is also associated with the risk of mental disorders in adolescents and young adults, such as social anxiety and decreased psychological well-being, especially when internet use is excessive and uncontrolled (Cahya, Ningsih and Lestari, 2023).

However, until now there has not been much research in Indonesia that has linked internet access at the macro (national) level with population mental health indicators quantitatively and comparatively. Most of the research is still cross-sectional and based on individual surveys, so it has not been able to explain how the expansion of internet access structurally affects the mental health of the Indonesian people in a global context (Hakim et al., 2024; Hermansyah & Rauntu, 2024).

Berbeda dengan Indonesia, Singapura sebagai negara dengan penetrasi internet hampir universal telah menjadi lokasi penting dalam studi dampak digitalisasi terhadap kesehatan mental. Penelitian menunjukkan bahwa penggunaan internet intensif di Singapura berkorelasi dengan meningkatnya stres dan kecemasan pada kelompok usia muda, khususnya mahasiswa dan pekerja muda, akibat tekanan sosial dan tuntutan produktivitas digital yang tinggi (Lee et al., 2022). Studi lain juga menemukan prevalensi *online social networking addiction* yang signifikan di kalangan mahasiswa Singapura, yang berasosiasi dengan gejala depresi dan gangguan afektif (Cheng et al., 2021).

On the other hand, Singapore also demonstrates how digital policies and a strong health system can mitigate the negative impact of the internet on mental health. Wide access

to *e-mental health* services and high digital literacy allows the use of the internet as a promotive and preventive tool for mental health, especially in the adult and elderly age groups (Handayani, Ayubi and Anshari, 2020). The comparison between Indonesia and Singapore underlines that the impact of internet access on mental health is strongly influenced by the country's policy context, level of development, and institutional capacity.

Although the international literature is constantly evolving, there is a clear research gap. First, most studies still focus on individual internet use, rather than internet access as a structural phenomenon at the country level. Second, cross-border research often does not include moderator variables such as digital inequality, human development, and mental health system capacity simultaneously in one analysis model (Anggraeni, 2024). Third, comparative studies between developing and developed countries in the same region, such as Indonesia and Singapore, are still very limited.

Based on this gap, the novelty of this research lies in a cross-border comparative approach that integrates national internet access data with population mental health indicators. This study not only examines the direct relationship between internet penetration and mental health, but also evaluates the role of structural factors as moderator variables, such as the level of economic development and digital inequality. Thus, this research contributes to the expansion of the literature that has been dominated by micro approaches and provides a more relevant macro perspective for public policy formulation.

The research framework developed in this study places national internet access as the main independent variable, which affects the mental health of the population as a dependent variable. The relationship is moderated by structural factors, such as the level of human development, digital policies, and the capacity of the national mental health system. In addition, control variables such as education, urbanization, and population demographics were included to control for heterogeneity between countries. This framework is based on a synthesis of previous empirical findings and is expected to be able to explain the variation in the impact of the internet on mental health more comprehensively in a global context.

Method

This study uses a type of qualitative content analysis research because its main focus is not just to measure statistical relationships between variables, but to explore the meanings, patterns, themes, and structural narratives behind the phenomena of internet access and mental health in a cross-country context. Qualitative content analysis allows researchers to explore text data, report narratives, and classify hidden meanings in secondary data source documentation in depth, not just as numbers or statistics. In public health and social science research, this method has been recognized as one of the important techniques for organizing communication information and identifying key topics and themes that emerge from complex textual data so

that meaning can be extracted systematically and accurately (Elo et al., 2014). This method provides flexibility to understand the sociocultural context and interpretation of digital content relevant to mental health, which cannot be captured with a quantitative approach solely due to limitations in capturing narratives and discourses in big data that are textual or narrative (Fu et al., 2023).

In relation to this study, the use of qualitative content analysis is also very relevant to enrich the interpretation of internet data and mental health at the national and global levels because this phenomenon is not only in the form of internet penetration statistics but also includes the narrative dynamics surrounding internet use and its impact on people's psychological well-being. Therefore, a qualitative approach can help uncover how digital content related to the internet and mental health is shaped, consumed, and understood by social actors, as well as the global and local contexts related to their meaning. This method is in line with qualitative practices in digital intervention research in the health sector, which often uses content analysis to understand the characteristics of data content and explore the meaning of texts in depth (Wiraguna and Widjaja, 2024).

This research also utilizes a qualitative big data approach, namely content analysis of big data in text, narrative, and statistics sourced from global databases. The big data approach in qualitative research has become a trend in the social and health sciences because the volume of digital data available is so large, coming from various platforms and secondary sources, that it demands analytical techniques that are able to capture patterns of meaning and narrative efficiently and rigorously (Alqazlan et al., 2025). This approach differs from traditional qualitative which relies on interviews or direct observation; Qualitative big data makes use of the vast amount of text, report, or narrative data that is already available for content analysis. In the field of digital health, for example, *qualitative content analysis* is used to evaluate online content related to health services, including social media content and large digital data sources, by mapping the themes, language patterns, and contexts that appear in the content content.

In this study, qualitative big data was carried out through the processing and analysis of content from textual datasets related to internet access and mental health indicators between countries, including narrative reports, descriptive summaries, and meta-narratives generated by global data sources. Analytical techniques will include the thematic coding stage, content categorization, and contextual interpretation of text documents extracted from selected databases. This process is carried out systematically using qualitative data analysis software to help manage large volumes of data, record key theme patterns, and build relationships between content narratives and the context of internet access and mental health.

This approach allows researchers to expand the analysis not only based on statistical numbers but also to understand how narratives about the internet and mental health are shaped in the context of global data, resulting in more holistic and informative interpretations. In addition, by combining

qualitative big data and digital narrative content, this study obtained a stronger approach in understanding complex issues at the global level as well as variability between countries influenced by cultural and social factors.

The main data source in this study is secondary global data obtained from the *Our World in Data* platform. *Our World in Data* is an online research and publication initiative promoted by the Global Change Data Lab, aiming to provide global data and graphs on major global issues such as poverty, health, education, and internet penetration in an open and standardized manner. Data on internet access such as *Share of the population using the Internet* is available on this site and shows the percentage of the population using the internet in a given time frame for almost all countries in the world. This dataset comes from official international sources such as the International Telecommunication Union which is processed and standardized in a format that is easy to use by global researchers.

In addition, *Our World in Data* also provides global mental health-related data such as the prevalence of mental disorders, anxiety levels, and other mental health indications that have been curated in an in-depth graph and description visualization format. This data allows for qualitative analysis by mapping large narratives regarding internet access and mental health in different countries. Because *Our World in Data* provides open data under the CC BY license, researchers can download, process, and interpret the data as per methodological needs, including the incorporation of descriptive narratives with thematic content analysis to extract deeper meaning in the context of this research.

In this study, the data collection process from *Our World in Data* will include extracting datasets based on internet penetration indicators, mental health prevalence, and relevant variables between relevant countries. The data will then be analyzed through a qualitative approach to explore narrative trends and theme patterns to understand the relationship between internet access and psychological well-being on a macro level. The combination of traditional content analysis and big data provides a richer understanding, which not only explains the statistical relationships between indicators but also the narrative context behind that global data.

Results

This section presents the research findings based on secondary data analysis obtained from Our World in Data, encompassing key indicators such as the prevalence of mental health disorders, internet usage rates, and reports of lifetime experiences of anxiety and depression at both global and country levels, particularly in Indonesia and Singapore. The analysis emphasizes temporal dynamics over the period 2010–2023, as well as cross-country comparisons to identify emerging patterns in the relationship between the expansion of internet access and mental health conditions in the digital era.

Through this approach, the findings go beyond merely describing statistical trends, offering a more contextual understanding of how rapid and large-scale digital transformation may influence psychological well-being across different societal settings. The following subsections elaborate these findings in greater detail, highlighting the interplay between technological development and mental health dynamics in an increasingly connected world.

Global and Regional Trends in Mental Health Disorders (2010–2021)

The first data shows the proportion of the population experiencing mental health disorders including depression,

anxiety, bipolar, eating disorders, and schizophrenia in the period 2010 to 2021. Globally, the proportion of the population with mental health disorders was relatively stable in the range of 12.7–12.9 percent until 2019, before experiencing a fairly sharp increase in the 2020–2021 period. In 2021, the global figure is close to 13.8 percent. A similar pattern is also seen in the Southeast Asian region, which even shows a slightly higher prevalence rate than the world average, reaching around 14 percent in 2021.

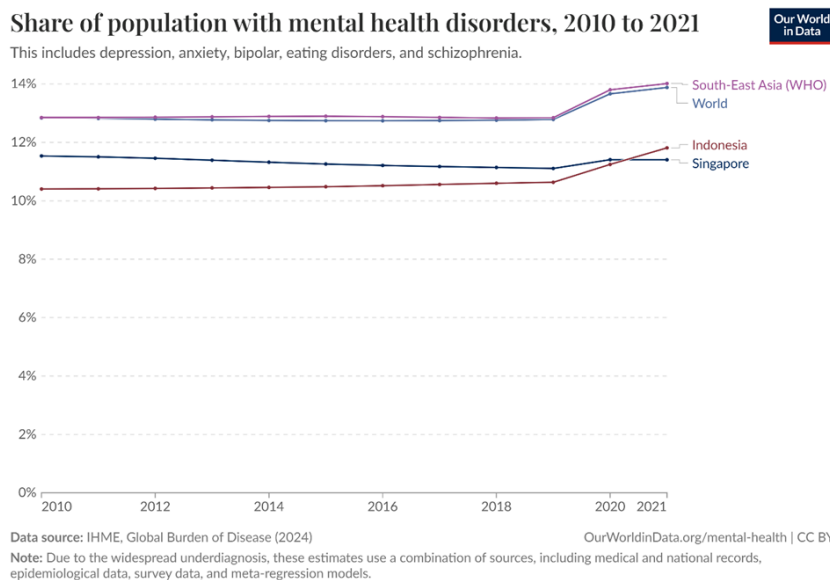


Figure 1. Data share of population with mental health disorders 2010-2021

These findings indicate that mental health disorders are a persistent global phenomenon and show a significant escalation in the final phase of the observation period. The sharp increase after 2019 hints at structural and contextual factors that affect mental health broadly, including changes in digital lifestyles, intensification of technology use, and increased social pressures in the era of high connectivity.

Comparison of Indonesia and Singapore in the Prevalence of Mental Disorders

At the country level, Indonesia and Singapore show different but equally relevant patterns in the context of digital transformation. Indonesia began the observation period with the prevalence of mental health disorders at around 10.4 percent in 2010 and experienced a gradual increase to almost 11.8 percent in 2021. This increase was relatively consistent and became sharper after 2019.

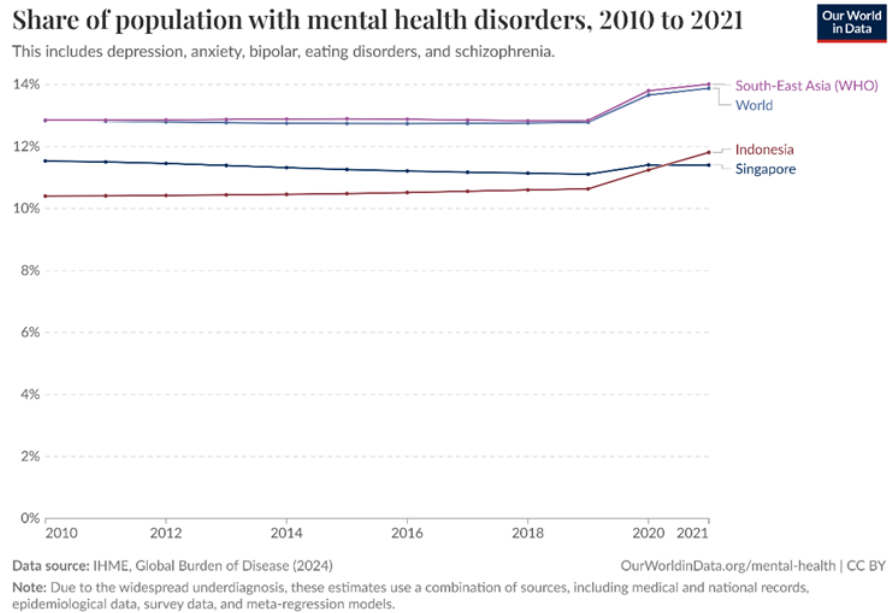


Figure 2. Data share of population with mental health disorders 2010-2021

In contrast, Singapore showed a higher prevalence rate at the beginning of the period, which was around 11.5 percent in 2010, but tended to be stable or even slightly declining until 2019 before increasing again in 2020–2021. At the end of the period, the prevalence in Singapore was in the range of 11.4–11.5 percent. These differences show that although Singapore has a more advanced health and digital infrastructure, mental health challenges still arise and are not fully mitigated by high levels of development. This comparison confirms that mental health disorders are not only related to the level of economic development, but also to the complex social and digital dynamics in each country

Global Internet Access Dynamics (2010–2023)

The second visualization illustrates the percentage of the population that used the internet in the last three months in the 2010–2023 period. Globally, there has been a very significant increase, from around 29 percent in 2010 to more than 66 percent in 2023. This increase shows the acceleration of digital transformation that is structural and cross-regional.

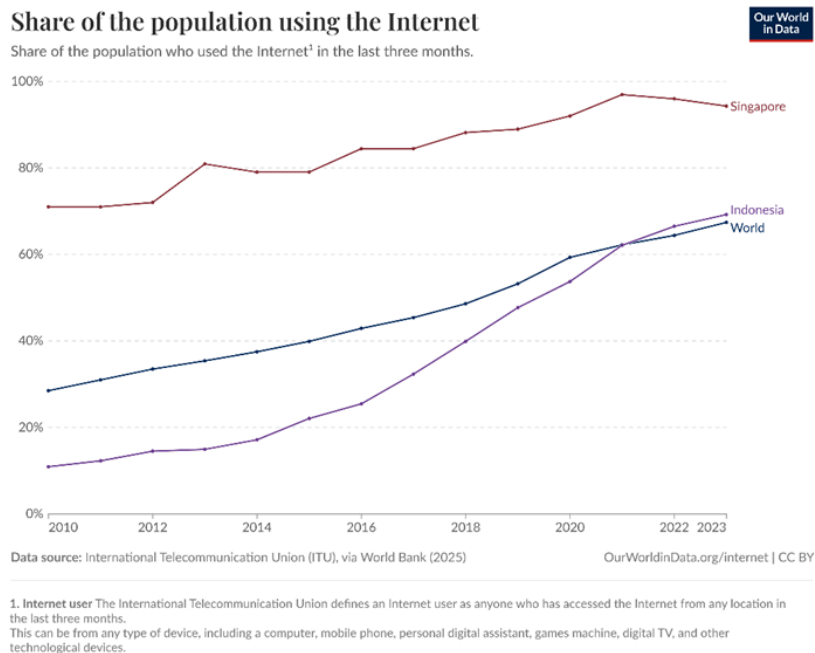


Figure 3. Share of the population using the internet

Singapore has consistently been well above the global average, with internet usage rates having exceeded 70 per cent since the start of the period and peaking at nearly 97 per cent in 2021. Despite a slight decline thereafter, Singapore's internet penetration rate remains very high. This reflects the condition of a society that is almost completely digitally connected. Indonesia shows the most drastic growth pattern. From just about 11 percent in 2010, internet usage increased sharply especially after 2015, and surpassed 67 percent in 2023. This surge shows the rapid acceleration of digital

technology adoption, but it also has the potential to pose significant social and psychological adaptation challenges.

Lifetime Anxiety and Depression Report (2020)

The third visualization reinforces previous findings by showing the proportion of respondents who reported having experienced anxiety or depression that interfered with daily activities for two weeks or more in 2020. Globally, about 19 percent of the population reported such experiences. In the Asian region, the figure is slightly lower, at around 16 percent.

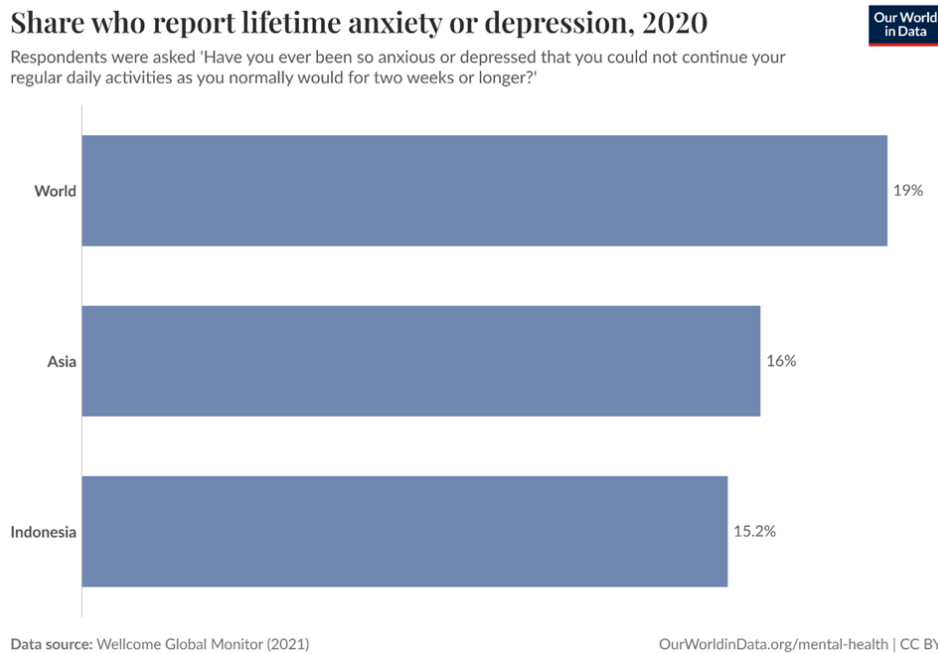


Figure 4. Share who report lifetime anxiety or depression 2020

Indonesia recorded a figure of 15.2 percent, which although below the global average, still shows that more than one in seven residents have experienced a significant psychological disorder. This figure becomes particularly relevant when it is associated with periods of sharp increase in internet use and changes in social interaction patterns during the digital age. These findings suggest that mental health disorders are not only detected through medical diagnosis, but are also reflected in the subjective experiences of individuals, who are most likely influenced by an increasingly intense digital environment.

Temporal Relationship between Internet Access and Mental Disorders

When compared temporally, the significant increase in internet access especially after 2015 goes hand in hand with the increasing prevalence of mental health disorders, especially in the period after 2019. Although these data do not directly show a causal relationship, the similarity in temporal alignment indicates a structural link between increased internet use and increased mental health risk. In Indonesia, the acceleration phase of internet adoption coincides with a gradual increase in reports of mental disorders. This suggests

that rapid digital transformation, without digital literacy readiness and adequate mental health support, can increase people's psychological vulnerability. Meanwhile, in Singapore, although the rate of internet use has been very high since its inception, the prevalence of mental disorders has persisted and increased again in the period of global crisis. This shows that digital saturation also brings its own risks, such as digital fatigue, online social pressure, and excessive exposure to information.

Discussion

The results show that the increase in internet access and use globally goes hand in hand with the increasing prevalence of mental health disorders, especially after 2019. These findings are in line with a number of international studies that confirm that the intensification of internet and digital media use correlates with an increased risk of depression, anxiety, and psychological stress. A cross-country study by Tuan (2022) also found that countries with high levels of digitalization tend to show a higher prevalence of mental disorders, especially among productive age groups. Conceptually, this phenomenon can be explained through the mechanism of information overload, online social pressure,

and increased exposure to negative or unrealistic content in the digital space. The Internet not only serves as a means of communication, but also forms a new social space loaded with symbolic competition, social comparisons, and constant productivity demands. Thus, increasing internet access does not automatically improve psychological well-being, but can actually increase mental vulnerability if it is not accompanied by adequate regulation and digital literacy.

However, the findings of this study also need to be read critically considering the literature that shows different results. Studies have emphasized that the internet can serve as a source of social support, access to mental health services, and an effective means of coping mechanisms, especially in countries with limited conventional health services. Digital platforms allow individuals to search for mental health information, join online communities, and access tele-mental health services that were previously difficult to reach. These differences in findings indicate that the relationship between internet access and mental health is contextual, not deterministic. The Internet can act as a protective factor as well as a risk factor, depending on the user's usage patterns, access goals, and social environment. In other words, it is not solely the level of internet penetration that determines mental health conditions, but the quality of digital interaction and the capacity of individuals and institutions to manage the digital space.

The findings of this study show significant variation between countries, especially between Indonesia and Singapore. Singapore, with an almost all-encompassing internet penetration rate, still shows a relatively high and stable prevalence of mental health disorders. This supports the argument that countries with advanced digital infrastructure are not immune to mental health risks due to digital saturation. On the contrary, Indonesia has experienced a surge in very fast internet usage in a relatively short time, accompanied by a gradual increase in mental health disorders. This pattern is consistent with the digital stress hypothesis theory, which states that the acceleration of technology adoption without psychosocial readiness can increase mental stress, especially in societies that are transitioning socially and economically.

In this context, digital inequality is not only related to access, but also to the capacity to mentally adapt to technology. Developing countries like Indonesia face a dual challenge: expanding internet access while managing its psychosocial impact. The results also show that the rate of reporting anxiety and depression in Asia is relatively lower than the global average. However, these findings do not necessarily indicate better mental health conditions. A number of studies show that cultural stigma, social norms, and reporting limitations often lead to underreporting of mental disorders in Asian countries, including Indonesia. Thus, the lower prevalence figures need to be interpreted carefully. In the context of a collectivist society, social pressures and expectations of norms often make individuals reluctant to openly express psychological problems. In the digital age, this pressure can be exacerbated by social media exposure that displays unrealistic standards of success and

happiness, thus worsening mental health conditions in a latent manner.

The surge in the prevalence of mental health disorders in the 2020–2021 period cannot be separated from the context of the global crisis, especially the COVID-19 pandemic. However, this study shows that the impact of the pandemic interacts strongly with the intensity of internet use. In this context, the internet serves as a double-edged sword: it becomes the main means of working, learning, and interacting, as well as a new source of stress. The findings of this study reinforce the argument that the global crisis is accelerating a pre-existing trend of increasing digital dependence and its impact on mental health. Theoretically, the results of this study support the digital ecology approach, which views mental health as the result of complex interactions between individuals, technology, and social structures. These findings also enrich the literature with cross-border perspectives, which are still relatively limited in the study of the relationship between the internet and mental health. This study confirms that the relationship between internet access and mental health is not linear or universal. Instead, the relationship is mediated by contextual factors such as development levels, culture, public policy, and institutional readiness. Therefore, generalization of findings from one country to another needs to be done carefully.

Conclusion

This study concludes that the increase in global internet access and use in the digital age is closely related to the dynamics of people's mental health, although these relationships are neither linear nor simply causal. Based on a comparative analysis between countries, especially between Indonesia and Singapore in a global context, it was found that countries with high internet penetration and countries that are experiencing accelerated digital adoption both face significant mental health challenges. Data shows an increase in the prevalence of mental health disorders and reports of anxiety and depression, especially in the period after 2019. These findings answer the research question by confirming that global digital transformation brings complex psychosocial implications, where the internet can serve as a source of opportunity as well as a risk to mental health, depending on the social, cultural, and digital governance context that surrounds it.

The main contribution of this study lies in a cross-country comparative approach that integrates global internet access analysis with international data-driven mental health indicators. This study enriches the literature by showing that the impact of digitalization on mental health is not only influenced by the level of technology penetration, but also by the speed of adoption, digital literacy readiness, and the capacity of the mental health system in each country. In addition, this research makes a conceptual contribution through the use of a qualitative content analysis approach to global health big data, which allows for a deeper understanding of empirical patterns that are often only read quantitatively. Thus, this study not only adds to the empirical

evidence, but also offers a relevant analytical framework for public policy formulation in the field of mental health and digital transformation governance.

However, this study has some limitations. First, the use of aggregated secondary data at the national level limits the ability of the analysis to capture variations in individuals, age groups, and other social factors. Second, this study did not examine the direct causal relationship between internet use and mental health disorders, so the findings need to be interpreted as contextual and associative relationships. Third, the limitation of primary qualitative data limits the exploration of individual subjective experiences in dealing with psychological pressure in the digital space. Therefore, further research is recommended to combine longitudinal quantitative approaches with in-depth qualitative studies, expand the scope of the country, and include mediating variables such as digital literacy, types of internet use, and national mental health policies. The approach is expected to provide a more comprehensive understanding of the relationship between digitalization and mental health in the future.

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