# E-therapy influence on mental health in generation z: Role of acces and engagement

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**Abstract.** Mental health is a significant concern in the digital age, particularly for Generation Z, who, despite their technological proficiency, remain vulnerable to psychosocial stress. This study seeks to examine the impact of e-therapy on the mental well-being of Generation Z, focusing on the moderating roles of accessibility and user engagement. A quantitative explanatory method with a cross-sectional design was used to gather data from 382 respondents in the Special Region of Yogyakarta who had engaged in e-therapy. The analysis results indicate that e-therapy significantly enhances mental well-being. Moreover, the degree of accessibility and user engagement substantially enhances the relationship. These findings underscore the necessity of creating e- therapy that is inclusive, readily accessible, and capable of sustaining user engagement. This study employs the theoretical framework of digital transformation in mental health services and advocates for interdisciplinary strategies to enhance the efficacy of e-therapy in promoting the mental well-being of the youth in Indonesia.

## 1 Introduction

In recent decades, the swift progression of digital technology has profoundly transformed numerous facets of human existence, including communication, education, business, and healthcare. The advent of digital platforms has transformed how people get information, engage with one another, and seek assistance for personal and professional matters. This digital transition has enhanced the efficiency and accessibility of several services while also generating new problems and disparities in access and use.

A crucial domain notably impacted by these developments is public health, particularly mental health care. The digital age, while its many benefits, has also introduced new stresses, like perpetual online connection, information overload, and social media pressure. These circumstances have exacerbated global apprehension around mental health, particularly within the digital native cohort.

Mental health is an increasingly urgent worldwide concern in the contemporary digital age. The prevalence of mental disorders globally has risen due to diverse social, economic, and technological pressures. The World Health Organization (WHO) indicates that around one billion individuals are afflicted by mental diseases, with this figure rising annually [1]. The primary obstacle in addressing mental disorders is restricted access to traditional

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services, such as in-person therapy, particularly in developing nations and isolated regions. Moreover, social stigma continues to be a substantial obstacle for individuals seeking professional assistance.

The advancement of information and communication technology (ICT) has created new possibilities in the delivery of mental health services. An important innovation in this field is e-therapy, a digital psychological intervention encompassing mobile applications, online counseling services, and web-based self-help programs [2]. E-therapy provides numerous benefits, including temporal flexibility, confidentiality, and accessibility for underserved populations.

Generation Z, comprising individuals born from the mid-1990s to the early 2010s, is a significant demographic in the realm of e-therapy. This generation is receptive to mental health concerns and is adept at utilizing technology in their daily routines. Nevertheless, they are also more susceptible to online social pressure, elevated personal expectations, and extensive exposure to social media content [3]. Consequently, e-therapy represents a pertinent and adaptable solution for this demographic.

Prior research has demonstrated that e-therapy can effectively alleviate symptoms of depression and anxiety. Meta- analyses indicate that online cognitive behavioral treatment (CBT) is equally effective as face-to-face therapy [4]. Moreover, accessibility and temporal flexibility enhance user compliance with the intervention. The efficacy of e- therapy relies not solely on the intervention's content but also on accessibility and user engagement levels.

Accessibility encompasses multiple dimensions, including device availability, internet connection quality, platform navigation ease, and information clarity [5]. Studies indicate that individuals who encounter challenges in accessing or utilizing e-therapy platforms generally experience diminished satisfaction and reduced intervention efficacy [6]. Consequently, comprehending and quantifying the accessibility perceived by users is crucial for enhancing the experience and results of digital therapy.

User involvement is a crucial determinant of e-therapy success. This involvement may be measured by many measures, including login frequency, session length, number of completed modules or exercises, and total program completion rate. Increased participation correlates with a greater likelihood of attaining substantial therapeutic outcomes. The elevated drop- out rate, particularly among younger users, suggests that the efficacy of digital interventions is influenced not only by the quality of their content but also by the program design's capacity to attract, retain, and motivate users to persist in their engagement throughout the therapeutic process.

The primary objective anticipated from e-therapy interventions is mental well-being. Mental well-being encompasses not

only the absence of mental disorders but also positive emotions, life satisfaction, and an individual's capacity to confront daily challenges [7]. In this context, alterations in mental well-being scores prior to and subsequent to engaging in an e-therapy program serve as the primary metrics for evaluating the intervention's efficacy. Considering the distinct traits of Generation Z and their proximity to technology, a comprehensive understanding of their experiences with e- therapy is essential for the advancement of more adaptive, inclusive, and sustainable digital mental health services.

This study relies on a theoretical framework that elucidates how digital transformation via the advancement of information and communication technology (ICT) has transformed mental health services [8]. Innovations like e-therapy have emerged as viable alternatives to traditional treatments, particularly for the tech-savvy younger population. This study specifically seeks to examine the impact of e-therapy on enhancing mental well-being in Generation Z, while investigating the influence of accessibility and user engagement as moderating variables in this relationship. The Special Region of Yogyakarta was selected as the research site due to its significant concentration of Generation Z students from diverse social and geographical backgrounds, a relatively advanced digital infrastructure exhibiting variations in access, and a distinctive culture that amalgamates modern and traditional values.

The presence of a mental health community and the prospects for local digital innovation render the Special Region of Yogyakarta a strategic and pertinent setting for examining the efficacy and dynamics of e-therapy utilization. This study aims to enhance the literature on digital mental health by offering empirical evidence regarding the correlation between e-therapy effectiveness, perceptions of service accessibility, and user engagement through a quantitative approach. The results of this study are anticipated to serve as a foundation for developing more adaptive policies and intervention strategies, as well as a practical reference for mental health application developers in creating inclusive, accessible platforms that ensure sustainable user engagement. This study may yield social benefits by mitigating the stigma associated with mental disorders, promoting increased access to user-friendly digital psychological services for the younger generation.

Based on the literature review and prior study outcomes, the suggested hypotheses are as follows: H1: The implementation of e-therapy positively influences the enhancement of mental well-being. Moderation Hypothesis:

H2: The degree of accessibility moderates the association between e-therapy utilization and mental well-being, such that the impact of e-therapy on mental well-being is more pronounced at elevated levels of accessibility.

H3 :User involvement moderates the relationship between e-therapy utilization and mental well-being, with the impact of e- therapy on mental well-being being more pronounced at elevated levels of involvement.

# 2 Method

## 2.1 Participants

This study employed a quantitative methodology utilizing an online questionnaire for data collection. The questionnaire was methodically crafted to investigate participants' experiences and views of e-therapy use during the preceding 12 months. This research involved 382 individuals from several areas within the Special Region of Yogyakarta, Indonesia. All participants belonged to Generation Z, aged 17 to 26 years, and were purposively chosen based on the criterion of having used e-therapy services at least once in the preceding year. The data gathering was conducted online to effectively and broadly engage participants, taking into account the traits of Generation Z, who are very adept with digital technology. The geographical distribution percentage of participation is shown in Table 1.

**Table 2.** Hypothesis Test

| Location | Number |
|---|---|
| Bantul Regency | 118 |
| Gunung Kidul Regency | 69 |
| Kulon Progo Regency | 53 |
| Sleman Regency | 99 |
| Yogyakarta City | 42 |

## 2.2 Research Instruments

The independent variable in this study was the quality of e-therapy utilization, assessed through a singular primary question concerning the respondents' satisfaction level with the e-therapy program in which they engaged. This statement employed a Likert scale ranging from 1 to 5, indicating levels from extremely unsatisfied to very pleased, representing a subjective assessment of the e-therapy participation experience. The dependent variable, mental well- being, was assessed using 10 selected statements from internationally validated psychometric scales, specifically the Warwick-Edinburgh Mental Well-being Scale (WEMWBS), the World Health Organization-Five Well-being Index (WHO-5), and the Scales of Psychological Well-Being (Ryff). The statements were curated and tailored to the participants' context and evaluated using a Likert scale to gauge mental well-being before and after e-therapy participation. Moderating factors included accessibility level and user engagement. Accessibility was assessed based on remarks about the simplicity of locating the e-therapy platform, the registration procedure, availability of devices and internet connectivity, and the user-friendliness of the service interface. User engagement was evaluated based on usage frequency, average session duration, and program completion rates. All statements employed a Likert scale to facilitate quantitative statistical analysis. Data collection was conducted anonymously via an online platform to guarantee comfort and impartiality for respondents. Ethical clearance was obtained from the relevant institution, with all participation being voluntary and confidential.

### 2.3 Data Analysis Techniques

Quantitative data analysis was conducted utilizing SmartPLS 4 software. Prior to testing the hypothesis, the researcher assessed the validity and reliability of the research instruments to guarantee the quality and suitability of the data. SmartPLS 4 facilitated extensive structural modeling and provided a visual and systematic representation of analytical outcomes, enhancing interpretation of variable relationships within the research model.

## 3 Result

This research assessed construct validity by examining the correlation between each indicator and the construct it measures, using the factor loading value. An indicator is considered legitimate if its loading value is no less than 0.7. The study findings indicated that the majority of indicators across all constructs—e-Therapy, Accessibility Level, User Engagement, and Mental Well-being—exhibited factor loading values above the threshold. This suggests that, overall, the instruments used have satisfied the criteria for convergent and discriminant validity.

In the User Engagement construct, two indicators, UE7 and UE8, exhibit factor loading values of 0.675 and 0.665, respectively, somewhat below the established threshold. Nonetheless, this construct remains included inside the model since these indicators are deemed conceptually important, and the construct continues to exhibit sufficient measurement robustness [9]. The results of the construct validity assessment and the factor loading values for each indicator are collectively shown in Figure 1.

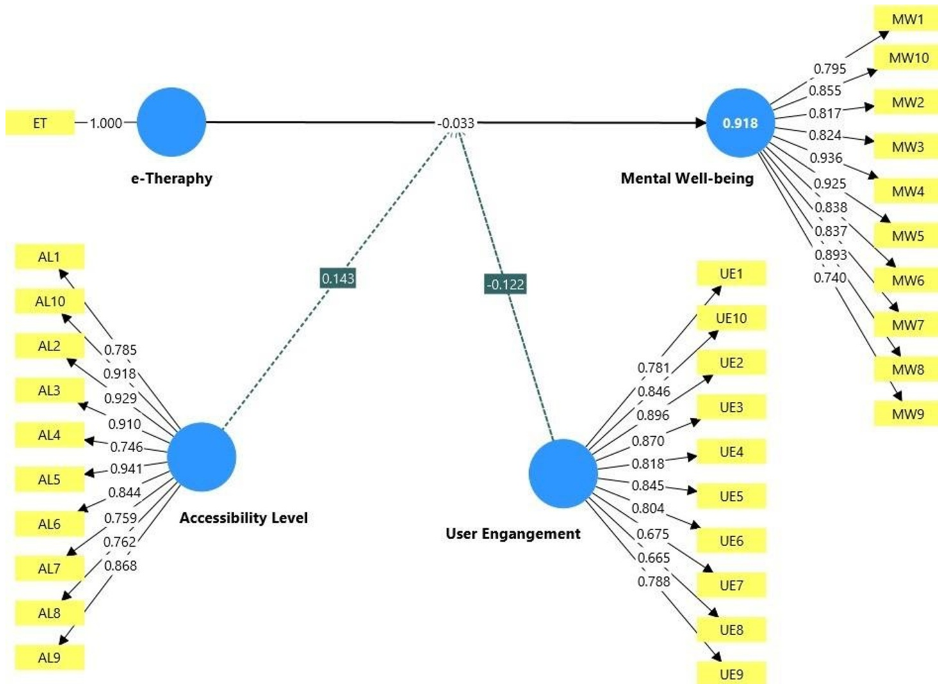


**Fig. 1.** Outer Model Output View.

The objective of hypothesis testing in this study is to address research issues using structural model analysis. This analysis examines the standardized regression weight value, which quantifies the strength of the influence between variables in the study. The causal relationship among the examined variables is illustrated comprehensively in Table 2 below.

**Table 2.** Hypothesis Test

| | β | T-Statistic | P-Value |
|---|---|---|---|
| e-Therapy -> Mental Well-being | 0.032 | 2.287 | 0.022 |
| Accessibility Level x e-Therapy -> Mental Well-being | 0.153 | 3.423 | 0.001 |
| User Engagement x e-Therapy -> Mental Well-being | 0.133 | 2.910 | 0.004 |

Note. β = standardized regression weight; p-value < 0.05 indicates statistical significance. E-therapy refers to online therapy interventions. Accessibility level indicates ease of access to e-therapy. User engagement measures participant involvement in e-therapy activities.

The hypothesis testing findings in Table 2 indicate that the regression coefficient for the impact of e-therapy on mental well-being ($\beta = 0.032$; $t = 2.287$; $p = 0.022$) demonstrates a positive and significant effect of e-therapy on enhancing mental well-being. The findings corroborate hypothesis 1, which posits that e-therapy positively influences mental well-being. The findings of the second hypothesis test are corroborated, indicating that the degree of accessibility moderates the relationship between e-therapy utilization and mental well-being ($\beta = 0.153$; $t = 3.423$; $p = 0.001$), such that the impact of e-therapy on mental well-being is more pronounced at elevated levels of accessibility. Furthermore, the findings of the third hypothesis test confirm that user engagement positively moderates the relationship between e-therapy utilization and mental well-being ($\beta = 0.133$; $t = 2.910$; $p = 0.004$). This indicates that higher levels of user engagement strengthen the beneficial effect of e- therapy on mental well-being. It should be noted that the path diagram displays the direct structural relationships, where some coefficients may appear negative. However, the hypothesis testing presented in Table 2 is based on moderation analysis using interaction terms. As such, the results demonstrate that both accessibility and user engagement significantly strengthen the positive effect of e-therapy on mental well-being, despite the direct path variations.

## 4 Discussion

This study's results indicate that e-therapy positively enhances the mental well-being of Generation Z. This substantiates the conclusion that technology may serve as a strategic instrument in overcoming the obstacles to obtaining mental health treatments, particularly for younger demographics familiar with the internet landscape [10]. In this context, e-therapy transcends traditional treatment, signifying a paradigm change in psychological practice from in-person interactions to more flexible, private, and accessible services.

An intriguing observation in these results is that the beneficial effects of e-therapy are not an isolated phenomenon; rather, they are significantly shaped by contextual factors such as accessibility and user engagement. This conclusion indicates that the efficacy of digital treatments is significantly contingent upon the quality of the whole user experience [11], rather than only on the substance or content of the intervention offered.

This study corroborates the findings of Opie et al. regarding the significance of platform discoverability, a seamless registration process, and user-friendly navigation in the digital interface as essential prerequisites for the efficacy of e-therapy [6]. In other terms, overly complex, unresponsive, or non-intuitive technology can generate additional obstacles, exacerbating frustration for individuals pursuing psychological assistance. Consequently, the creation of e-therapy platforms must incorporate inclusive design elements, accommodating diverse levels of digital literacy and addressing infrastructural obstacles such as inadequate internet connectivity or restricted device availability. User engagement is a crucial factor in comprehending the effects of e-therapy on mental well-being. The discovery that engagement influences the correlation between e-therapy utilization and mental well-being underscores the necessity of sustaining consistency and intensity of user involvement during the therapeutic process [12]. This aligns with the principle in clinical psychology that significant psychological transformation does not happen instantaneously, but rather results from the cumulative effect of consistent practice. Consequently, strategies that enhance user engagement, including gamification systems, personalized feedback, and online community support, can substantially improve the efficacy of digital interventions. It is worth noting that the structural model displays a negative direct path from user engagement to e-therapy utilization. However, the moderation analysis presented in this study confirms that user engagement significantly strengthens the effect of e-therapy on mental well-being. This implies that while engagement alone may not directly drive higher utilization, it acts as a catalyst that amplifies the positive outcomes of e-therapy when combined with active participation.

Moreover, it is essential to recognize that Generation Z comprises digital natives who frequently encounter variable emotional states, social media pressures, and intricate identity crises. In this context, overly generic or insufficiently contextual e-therapy may diminish its relevance to users. Consequently, the findings of this study implicitly advocate for a personalized e-therapy approach, specifically interventions customized to the individual's psychosocial profile, learning style preferences, and current emotional state.

This study's results provide significant theoretical advances by expanding the digital psychological intervention paradigm to include accessibility and participation as moderating elements. This enhances the digital transformation framework in mental health care, which has mostly emphasized technological and content dimensions [13]. rather than comprehensively addressing the dynamics of user engagement.

This research also offers significant policy implications. If e-therapy is demonstrated to enhance mental well-being, systemic support from the government and educational institutions is necessary to incorporate this digital service into the public service framework. Educational institutions, including schools, universities, and youth service centers, can strategically facilitate the implementation and utilization of e-therapy [14]. This integration necessitates stringent personal data security regulations, training for digital companions, and oversight of service ethics. The advancement of e-therapy must not solely depend on technical or aesthetic considerations; it necessitates interdisciplinary collaboration among psychologists, UX designers, software engineers, and digital communication specialists to ensure that platform functionalities are grounded in evidence-based principles and focused on user experience. This study, while demonstrating a significant relationship between variables, has limitations; specifically, quantitative designs utilizing cross-sectional data fail to elucidate causal relationships comprehensively. Moreover, employing a singular core item to assess satisfaction with e-therapy, while efficient, has constraints in fully encapsulating the complexities of user experience. Consequently, additional research utilizing a longitudinal or mixed-method approach can yield more profound and contextual insights.

In this regard, a longitudinal strategy is particularly recommended for future studies to assess the enduring effects of e- therapy use and to monitor the evolution of user involvement over time, while randomized controlled trials remain essential to establish causal evidence. Combining both approaches would therefore provide a more comprehensive understanding of e- therapy's effectiveness and sustainability. A qualitative method may investigate subjective aspects of user experience that quantitative data may overlook, including emotional obstacles, perceptions of efficacy, and personal values associated with the digital therapeutic process. Examining groups with varied socioeconomic, geographic, and cultural backgrounds is crucial to evaluate the relevance and adaptability of e-therapy across different situations within Indonesian culture.

In Indonesia, particularly in regions exhibiting both urban and rural traits like the Special Region of Yogyakarta, the digital gap and stigma surrounding mental health present significant obstacles [15]. This study's results demonstrate that e-therapy serves both as a tool for mental health management and as a technique to enhance access to psychological treatments for young individuals.

This research affirms that the efficacy of e-therapy treatments relies not just on their digital format, but also on their alignment with the user's requirements and situation. Accessibility and user involvement significantly influence the efficacy of treatments. The integration of tailored, evidence-based, and inclusive e-therapy services is essential for Generation Z as they navigate a complicated psychological terrain in the digital age. Future projects must emphasize user experience, technological integration, and socio-cultural significance to enhance the therapeutic efficacy of these digital services.

This study's results affirm that the efficacy of e-therapy is significantly impacted by a supportive digital environment and proactive user participation. Although technology is not the only remedy, it may serve as a potent catalyst when properly developed and executed. With the rising need for mental health services and the growing prevalence of technology among younger demographics, inclusive, individualized, and evidence-based e-therapy may emerge as a vital element of contemporary psychological support system.

## 5 Conclusion

This study's findings affirm that e-therapy significantly enhances the mental well-being of Generation Z in the Special Region of Yogyakarta. The efficacy of e-therapy is significantly enhanced by elevated accessibility and proactive user participation. The efficacy of digital interventions is influenced not only by the therapeutic content but also by accessibility and the quality of the user experience. Consequently, the advancement of e-therapy services must prioritize inclusive design and strategies to sustain engagement. Within the realm of mental health policy, the incorporation of e-therapy into the public service framework and the promotion of user-centered digital innovation are crucial measures to enhance the accessibility of effective and sustainable psychological services for the youth.

## 6 Implication

This study's findings affirm that e-therapy significantly enhances the mental well-being of Generation Z in the Special Region of Yogyakarta. The efficacy of e-therapy is significantly enhanced by elevated accessibility and proactive user participation. The efficacy of digital interventions is influenced not only by the therapeutic content but also by accessibility and the quality of the user experience. Consequently, the advancement of e-therapy services must prioritize inclusive design and strategies to sustain engagement. Within the realm of mental health policy, the incorporation of e-therapy into the public service framework and the promotion of user-centered digital innovation are crucial measures to enhance the accessibility of effective and sustainable psychological services for the youth.

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