



RESEARCH ARTICLE

Qualitative Processes Associated with Social Interaction with ChatGPT and Digital Mental Health Literacy among Indonesian Generation Z

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Abstract. The rapid adoption of generative artificial intelligence among Indonesian Generation Z has not been accompanied by adequate readiness to critically navigate the mental health information it provides. This study examined the association between Social Interaction with ChatGPT and Digital Mental Health Literacy (DMHL) and explored the qualitative processes that may help explain this association. It was hypothesized that social interaction with ChatGPT would be positively associated with digital mental health literacy. This study employed an explanatory sequential mixed-methods design. The quantitative phase involved 195 Indonesian Generation Z ChatGPT users aged 18–25 years and was analyzed using Pearson's and Spearman's correlation analyses, followed by simple linear regression. Subsequently, twelve participants were purposively selected to represent four qualitative sampling profiles: High–High, Medium–Medium, Low–Low, and High–Low. The quantitative findings revealed a significant positive relationship between social interaction with ChatGPT and digital mental health literacy ($r = 0.660$, $R^2 = 0.435$, $p < .001$). The qualitative findings suggested that the association may be expressed through different patterns of emotional accessibility, perceived relational closeness, critical awareness, reflective practice, and continued reliance on human support. The findings indicate that interaction with ChatGPT should be understood in relation to both users' cognitive evaluation of information and their emotional and relational experiences, while maintaining appropriate human and professional support.

Keywords: ChatGPT, Digital Mental Health Literacy, Generation Z, Generative AI, Mixed Methods, Human AI-Interaction

INTRODUCTION

The rapid development of generative artificial intelligence (generative AI) has fundamentally altered the ways in which people interact with digital technologies. Indonesia has emerged as a rapidly growing market for AI adoption. The 2025 Internet Survey conducted by the Indonesian Internet Service Providers Association (APJII) reported that Generation Z accounted for 43.7% of AI users, followed by Millennials at 22.3%, a pattern consistent with Generation Z's broader characterization as digital natives who have integrated technology into daily life since early development (Jayatissa, 2023). These figures indicate

differences in AI use across generational groups rather than the proportion of the entire Indonesian population using AI. This distinction is important because AI adoption should not be interpreted as equivalent to AI literacy. Adoption figures describe patterns of technology use, whereas AI literacy concerns users' ability to understand, evaluate, and appropriately apply AI-generated information. This distinction is particularly important in the context of generative AI, which is increasingly used not only for information retrieval but also for personal, emotional, and psychologically oriented needs.

This distinction between AI adoption and AI literacy is particularly important because generative AI is no longer used solely as an information retrieval system. Instead, it has increasingly become a medium through which individuals seek support for personal, emotional, and psychological needs.

Particularly, ChatGPT has evolved its initial purpose of an information retrieval system to a more personal and interactive conversation partner, which aligns with theories of the increasing psychological agency users bestow on AI systems in mediated communication (Sundar, 2020). As Luo et al. (2025a) pointed out, users have begun to use ChatGPT in more than information seeking activity and instead have begun to promote self-reflection, and some even view these

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interactions as therapy-like conversations. Such trends have been witnessed in studies on the use of chatbots and perceived social connectedness in users, yet the nature and orientation of the links between the two is inconsistent in studies (Herbener & Damholdt, 2025; Fang et al., 2025). Taken together, these results imply that ChatGPT is no longer a passive technological device. Rather, it is proactive in stating how individuals view and respond to their own psychological needs, including their mental health needs.

Thus, the Digital Mental Health Literacy (DMHL) has become more important. DMHL is an ability of a person to get, interpret, critically evaluate and successfully apply the mental well-being information obtained by digital landscapes (Norman and Skinner, 2006; Neter and Brainin, 2012), an ability that has proven to be associated with the amount and quality of digital media consumption among the youth in Indonesia. However, the existing data shows that the state of health literacy of Indonesian generation Z is not consistently in-depth and is often superficial (Rudianto, 2022). Ban et al. (2024) also theorized it as a four-interrelated competency comprising of self-regulation to health-related goals, information processing, communication, and the use of health information in everyday decisions. The competencies are applicable as it was revealed in the findings of McBain et al. (2026), who established that most of the adolescents and young adults, who accessed mental health advice via AI chatbots, did not disclose such interactions to anyone, including their parents or mental health professionals. This was not publicized, but generally users were quite pleased with the information they received. This pleasure, though, might merely indicate the propensity of AI chatbots to come up with answers that seem convincing and self-assured as opposed to being medically accurate. Without an adequate DMHL, the capability of ChatGPT to provide believable mental health guidance will be overvalued by the users.

Although the application of AI chatbots is on the rise, there is little empirical research to study the connection between them and Digital Mental Health Literacy (DMHL). To provide an example, Rahsepar Meadi et al. (2025) carried out a research largely on how users view conversational agents and the ethical implications of their use without explaining how DMHL develops as it interacts with the technologies. In contrast, Hawkins et al. (2025) demonstrated that structured educational interventions could be used to enhance digital health literacy in adolescents and this suggested that literacy was not an innate trait but a skill, which is learned and improved with continued learning and experience. However, this type of developmental approach is not investigated so far in terms of the relations with the generative AI. As a result, even though there is already evidence that suggests that Social Interaction with ChatGPT is associated with Digital Mental Health Literacy, the psychological processes that underlie the relationship are poorly understood.

This gap is specifically significant as previous research has not described how the use of ChatGPT helps or does not help in developing DMHL. Although Ban et al. (2024) identified the multidimensionality of digital health literacy, their framework does not take into consideration the quality of interactions with generative AI as a factor that leads to the emergence of literacy. This issue is particularly relevant to Generation Z in Indonesia, which represents the largest proportion of AI users among the generational groups reported in the APJII survey (APJII, 2025). Moreover, research that combines quantitative results with detailed qualitative descriptions of the varied experiences of users, not just presenting average tendencies or statistical

relationships, are few, especially those using an Explanatory Sequential Mixed-Methods Design.

To fill this gap, the current research aims to provide the psychological processes of the association between Social Interaction with ChatGPT and Digital Mental Health Literacy (DMHL). This paper makes two main contributions to the literature. First, it finds the differences between user profiles depending on the intensity of ChatGPT interaction, as well as levels of DMHL, which has not received much attention in prior studies, which has typically focused on the assumption that this relationship is similar among individuals. Second, this paper suggests a stepwise procedure to demonstrate that the availability of information via ChatGPT can promote or hinder the creation of holistic DMHL.

Accordingly, this study aimed to examine the association between Social Interaction with ChatGPT and Digital Mental Health Literacy among Generation Z in Indonesia, to explore the experiences and qualitative processes that may help explain this association, and to integrate the quantitative and qualitative findings into a coherent mixed-methods interpretation

METHODS

Research Design

The research design that was used was an Explanatory Sequential Mixed-Methods Design (Creswell and Plano Clark, 2018; Tashakkori & Teddlie, 2010). The quantitative stage was carried out in the first place in order to analyze the correlation between Social Interaction with ChatGPT and Digital Mental Health Literacy (DMHL). The results of this stage then informed the choice of participants in the qualitative phase that would provide additional detail in the explanation of the psychological mechanisms that would have underpinned the relationship found in the results. Lastly, quantitative and qualitative results were combined to come up with a more detailed explanation of the phenomenon that was being investigated.

Participants

The respondents of the quantitative stage were the Indonesian Generation Z aged 18-25 years who had actively used ChatGPT in the last three months. They used purposive sampling in the process of recruiting the participants. Participants were recruited through social media platforms, including WhatsApp and Instagram as well as through peer to peer referral among prospective respondents. As an incentive, five respondents were randomly selected through a raffle to receive e-money vouchers upon survey completion.

The inclusion criteria was that the participants had to be willing to give informed consent and fill out all research instruments. After the screening process, 195 participants were selected to be included in the quantitative analysis which included 133 women (68.2%) and 62 men (31.8%) and aged between 18 and 25 years. The majority of the participants were university/college students (57.4%), then there were also employed students (21.5%), and full-time employees (15.9%). The vast majority of them (61.0%) have been using ChatGPT more than a year, and nearly half of them (48.2%) said that they use ChatGPT every day.

The qualitative phase involved twelve participants who were purposively selected from the quantitative sample. The participants were distributed across four qualitative sampling profiles, with three participants in each profile:

High–High, Medium–Medium, Low–Low, and High–Low. The High–High participants had high scores on both Social Interaction with ChatGPT and DMHL. The Medium–Medium participants had scores close to the central tendency of the quantitative sample. The Low–Low participants had relatively low scores on both variables, whereas the High–Low participants had relatively high Social Interaction with ChatGPT scores but comparatively lower DMHL scores.

The twelve participants were assigned anonymous codes ranging from HH-01 to HH-03, MM-01 to MM-03, LL-01 to LL-03, and HL-01 to HL-03. Selection also considered the participants' reported frequency of ChatGPT use and their willingness to participate in a follow-up interview. A Low–High profile was considered theoretically because it could indicate that high DMHL may develop without intensive interaction with ChatGPT. However, no participant representing this profile was included in the qualitative sample. This should not be interpreted as evidence that the profile was absent from the quantitative dataset. Rather, the qualitative sampling focused on the four selected profiles and was constrained by participant availability and willingness to participate. This sampling design was to give a range of experiences that would explain the quantitative results more in detail.

Typology Formation

For the qualitative sampling, participants were classified using their total score on the social interaction with ChatGPT scale (Total A) and the Digital Mental Literacy Scale (Total B). In the quantitative sample, Total A ranged from 41 to 120 ($M = 86.15$, $SD = 16.99$, $Mdn = 86$), whereas Total B ranged from 43 to 92 ($M = 70.72$, $SD = 10.99$, $Mdn = 70$).

The typology was used as a purposive qualitative sampling framework rather than as a diagnostic classification. The High–High profile represented participants with clearly elevated scores on both variables. The Medium–Medium profile represented participants whose scores were close to the central tendency of the quantitative sample. The Low–Low profile represented participants with relatively low scores on both variables. The High–Low profile represented participants with relatively high Total_A scores but comparatively lower Total_B scores.

A Low–High profile was also considered theoretically. This profile represents relatively low interaction with ChatGPT combined with relatively high DMHL and could indicate that DMHL develops through sources other than intensive interaction with ChatGPT. However, no Low–High participant was included in the qualitative interview sample. This should not be interpreted as evidence that the profile was absent from the quantitative dataset. Rather, the qualitative sampling focused on the four selected profiles and was constrained by participant availability and willingness to participate.

Research Instrument

They used two instruments in this study. The Social Interaction with ChatGPT Scale, a 30-item instrument designed to measure five dimensions of interaction between the participants and ChatGPT and included the intensity of interaction, the purpose of interaction, self-disclosure, the extent to which the participants tend to feel during the interaction with ChatGPT, and the responsiveness the participants experience during the interaction with ChatGPT, which was created based on the psychology of human interaction with AI (Sundar, 2020). Digital Mental

Health Literacy (DMHL) Scale included 23 items to assess the abilities of the respondents to access, understand, critically analyze and utilize digitally obtained mental health information based on the eHealth literacy framework (Norman and Skinner, 2006; Neter and Brainin, 2012). The two tools were based on four-point Likert scale (1 (Strongly Disagree) to 4 (Strongly Agree)) with a total score reflecting the degree of Social Interaction with ChatGPT or Digital Mental Health Literacy. The item total correlation analysis was used to measure instrument validity, and Cronbach alpha coefficient was used to measure internal consistency reliability. The results showed that the set validity criteria were met by all items, and that both measures had adequate internal consistency, which is why they were applicable in the present study.

Research Procedure

The data was gathered in two sequential phases according to the Explanatory Sequential Mixed-Methods Design. The initial step was to conduct an online survey via Google Forms among the participants that fit the set inclusion criteria. After data collection, the responses were filtered and filtered based on the inclusion criteria and followed by the descriptive and inferential statistical analysis to describe the characteristics of the participants and test the association between Social Interaction with ChatGPT and Digital Mental Health Literacy (DMHL). After the quantitative analysis, the results were used to guide purposive selection for the qualitative phase. Twelve participants were selected to represent the four qualitative sampling profiles described above. Semi-structured interviews were then conducted individually in Bahasa Indonesia, either online or face-to-face, depending on participant availability and preference. Interviews were audio-recorded with participants' permission, transcribed verbatim, and securely stored on password-protected devices accessible only to the research team.

Data Analysis

Descriptive statistics, Shapiro-Wilk normality test, Pearson's product-moment correlation, and simple linear regression were used to analyze quantitative data to determine the relationship between Social Interaction with ChatGPT and Digital Mental Health Literacy (DMHL). Because the normality test indicated that both the two variables were not normally distributed, the rank-order correlation (Spearman rho) was also provided to support the Pearson correlation analysis.

Qualitative data were analyzed manually, without the use of qualitative data analysis software using grounded theory informed coding procedures, comprising open coding, axial coding, and selective coding (Corbin and Strauss, 2015; Glaser & Strauss, 1967). Coding was conducted by a single member of the research team (the first author). Given the single coder approach, formal interrater reliability procedures were not applicable. The qualitative sample size of twelve participants was determined pragmatically by participant availability and willingness to be interviewed, rather than by a formal assessment of thematic saturation.

Comparison of experience pattern among the four groups of participants was done using cross case analysis. Finally, quantitative and qualitative data were integrated through developing a joint visualization and a meta-inference process was performed to derive an overall picture of the psychological processes of the relationship

between Social Interaction with ChatGPT and Digital Mental Health Literacy (DMHL) among the Generation Z

Ethical Consideration

This research was done within the ethical standards of a research on human subjects. All the respondents and those taking part in the interviews were willing to participate and had to provide informed consent as an element of the online questionnaire. The confidentiality of qualitative participants was provided under the form of identification codes (e.g., HH-01 and MM-01), and all the collected information were used during the research. The participants were reminded that they could opt out of the study without being punished or affecting the study in a negative manner.

RESULTS

Respondent Characteristics

A total of 195 Indonesian Generation Z respondents met the inclusion criteria (age 18-25, active ChatGPT use within the past three months) and were included in the quantitative analysis. The sample had a mean age of 21.09 years ($SD = 2.26$) and comprised 133 women (68.2%) and 62 men (31.8%). Regarding domicile, the majority of participants (63.1%) resided in the Central Java region (including Batang, Semarang, Pekalongan, and Kendal), while the remaining 36.9% were distributed across other regional of Indonesia, including Jakarta, Bekasi, Surabaya, and Lamongan. Most participants were university or college students (57.4%), followed by working students (21.5%) and full-time employees (15.9%). Regarding ChatGPT experience, 61.0% had used ChatGPT for more than one year, and 48.2% reported near daily use. Regarding the purpose of use, 32.3% of participants reported using ChatGPT for emotional support, in addition to information seeking and problem solving purposes, indicating that a substantial proportion engaged with ChatGPT beyond purely instrumental needs.

Descriptive Statistics

The descriptive statistics revealed that the total score of Social Interaction with ChatGPT ranged from 41 to 120 ($M = 86.15$, $SD = 16.99$, $Mdn = 86.00$, $IQR = 27.50$). Digital Mental Health Literacy (DMHL) scores ranged from 43 to 92 ($M =$

70.72 , $SD = 10.99$, $Mdn = 70.00$, $IQR = 13.50$). Both instruments demonstrated excellent internal consistency (Social Interaction with ChatGPT: $\alpha = .966$; DMHL: $\alpha = .953$). The skewness of both variables (Social Interaction with ChatGPT: -0.109 ; DMHL: -0.522) indicated a slight negative skew, suggesting that most participants reported moderate-to-high levels of social interaction and digital mental health literacy.

Normality Test

The Shapiro-Wilk test showed that none of the variables were normally distributed (Social Interaction with ChatGPT: $W = 0.975$, $p = .0016$; DMHL: $W = 0.955$, $p < .001$). Therefore, in addition to Pearson correlation, the rank-order correlation, offered by Spearman, was also reported, which is recommended in case the normality assumption is violated (Pallant, 2020).

Correlation Between Social Interaction with ChatGPT and Digital Mental Health Literacy

Correlation analyses showed a significant positive relationship between Social Interaction with ChatGPT and Digital Mental Health Literacy, both with Pearson Product moment correlation ($r = .660$, 95% CI [.572, .732], $p < .001$) and Spearman rank order correlation ($\rho = .691$, 95% CI [.610, .758], $p < .001$). The fact that the correlation coefficient of parametric correlation was similar to the nonparametric correlation coefficient indicates that the correlation between the two variables was positive despite the violation of the normality assumption.

Simple Linear Regression Analysis

Simple linear regression analysis indicated that Social Interaction with ChatGPT was a significant predictor of Digital Mental Health Literacy ($B = 0.426$, 95% CI [0.357, 0.495], $SE = 0.035$, $t = 12.19$, $p < .001$). The regression model was statistically significant, $F(1,193) = 148.56$, $p < .001$, explaining 43.5% of the variance in Digital Mental Health Literacy ($R^2 = .435$, Cohen's $f^2 = 0.77$, indicating a large effect size). Following the quantitative analysis, twelve participants were selected for the qualitative phase to represent four qualitative sampling profiles. Their individual Total A and Total B scores, reported ChatGPT-use frequency, and assigned profiles are presented in Table 1.

Table 1. Quantitative Scores and Qualitative Sampling Profiles of the Interview Participants

Informant Code	Total A	Total B	Frequency of ChatGPT use	Qualitative Profile
HH-01	120	92	Almost every day	High-High
HH-02	117	88	Almost every day	High-High
HH-03	115	89	2-3 times / week	High-High
MM-01	86	70	Almost every day	Medium-Medium
MM-02	87	69	2-3 times / week	Medium-Medium
MM-03	84	72	2-3 times / week	Medium-Medium
LL-01	41	55	Rarely	Low-Low
LL-02	53	57	Rarely	Low-Low
LL-03	61	43	2-3 times / week	Low-Low
HL-01	107	69	2-3 times / week	High-Low
HL-02	99	50	Almost every day	High-Low
HL-03	90	60	Once / week	High-Low

The selected High–High participants had the highest Total A and Total B scores among the qualitative participants. The Medium–Medium participants had scores close to the central tendency of the quantitative sample. The Low–Low participants had relatively low scores on both variables. The High–Low participants showed a discordant pattern, with relatively high Total A scores but comparatively lower Total_B scores.

Qualitative Findings

Qualitative findings are organized around six substantive categories that emerged from the analysis, rather than solely by typology. Each category is illustrated with direct participant quotations, followed by an explanation of how the pattern manifested differently across the four interaction literacy typologies.

Category 1: ChatGPT as an Accessible Emotional Interlocutor

This category describes the tendency to use ChatGPT as an accessible conversational resource during moments of emotional need. HH-01, a participant in the High–High profile, described turning to ChatGPT as an immediate response to distress: “It’s like first aid whatever happens, ChatGPT is what I open first.” (HH-01, translated from Indonesian).

This statement suggests that ChatGPT was readily available to the participant and was often approached before other forms of support. It indicates a strong tendency to turn to ChatGPT first, but it does not by itself establish clinical emotional dependence. In contrast, MM-01, a participant in the Medium–Medium profile, described more situational use: “I use ChatGPT when I am confused.” (MM-01, translated from Indonesian).

MM-01 reported using ChatGPT approximately two to three times per week rather than treating it as a default response to every difficulty. These accounts suggest that ChatGPT’s accessibility as an emotional interlocutor was most pronounced in the account of HH-01 and more conditional in the account of MM-01. The findings illustrate variation in the extent to which ChatGPT was incorporated into participants’ emotional coping practices.

Category 2: Emotional Engagement and Perceived Relational Closeness

This category concerns the extent to which participants experienced ChatGPT as relationally close, including moments when the boundary between AI and human interaction became less salient. HH-01 stated: “Sometimes I forget that it is AI, not a human.” (HH-01, translated from Indonesian)

This statement reflects HH-01’s subjective experience of relational closeness and suggests that the interaction could feel socially meaningful. However, it does not demonstrate that ChatGPT possessed human qualities or that it had replaced interpersonal relationships. By contrast, LL-01 maintained a clear distinction between ChatGPT and human beings: “ChatGPT is a machine, not a human being.” (LL-01, translated from Indonesian)

LL-01 also emphasized the importance of interpersonal communication: “Communication with people around me still comes first.” (LL-01, translated from Indonesian). These contrasting accounts indicate that perceived relational closeness was more evident in HH-01’s account, whereas LL-01 maintained a clearer boundary between AI-mediated interaction and human relationships

Category 3: Critical Awareness and Reflective Practice

This category captures how participants recognized the limitations of ChatGPT and whether that recognition was translated into verification or reflective practice. HL-01 acknowledged the limitations of ChatGPT while still using it for emotional expression: “I vent to it, but I don’t fully take it at face value, I know it’s a robot.” (HL-01, translated from Indonesian).

This statement indicates that HL-01 distinguished between using ChatGPT as a space for emotional expression and accepting its responses as authoritative. HL-03 expressed a stronger boundary regarding the use of ChatGPT for psychological concerns: “When it comes to psychological matters, I don’t trust ChatGPT.” (HL-03, translated from Indonesian).

These accounts show that critical awareness was explicitly expressed by the selected High–Low participants. However, awareness of ChatGPT’s limitations should not automatically be interpreted as comprehensive DMHL. DMHL also involves the ability to access, understand, evaluate, and appropriately use digital mental health information. The extent to which critical awareness was translated into sustained reflection or behavioral application is considered further in Category 6.

Category 4: Instrumental Use and Continued Reliance on Human Support

This category reflects the use of ChatGPT for practical, informational, or initial emotional support while human relationships remained an important source of support. MM-01 explained: “Once my mood is back to normal, I still talk to my friends.” (MM-01, translated from Indonesian)

This account suggests that ChatGPT functioned as an initial or supplementary resource rather than a replacement for interpersonal relationships. The pattern was consistent with the Medium–Medium profile, whose scores were close to the central tendency of the quantitative sample and whose reported use was more situational than that of the High–High participants. The account also indicates that MM-01 differentiated between temporary support obtained from ChatGPT and continued communication with friends. Thus, the Medium–Medium pattern was characterized by a more bounded and instrumental form of engagement.

Category 5: Limited Interaction and Shallow Processing

This category describes limited engagement with ChatGPT and minimal further exploration or verification of the information received. LL-01 described using ChatGPT mainly when necessary and valued it for reducing the effort required to think: “ChatGPT gives answers right away; it saves my brain the effort of thinking.” (LL-01, translated from Indonesian). For psychological concerns, LL-01 preferred human sources of support: “For psychological matters, I would rather talk to a trusted friend or a psychologist.” (LL-01, translated from Indonesian).

These statements suggest that LL-01 used ChatGPT primarily for immediate and instrumental answers, while psychological concerns were directed toward trusted people or professionals. This pattern was consistent with LL-01’s relatively low Total A and Total B scores. The account indicates limited reflective engagement with ChatGPT-derived information, but it does not imply that all Low–Low participants had identical experiences.

Category 6: Divergent Pathways Between Interaction and DMHL

Taken together, the preceding categories suggest that the association between Social Interaction with ChatGPT and DMHL may involve different qualitative processes rather than a single uniform pathway. The selected High–High participants had the highest Total A and Total B scores among the qualitative participants. The account of HH-01 emphasized immediate emotional accessibility and perceived relational closeness. These findings suggest that emotional engagement may accompany higher reported DMHL in some participants, but they do not establish that emotional engagement caused higher DMHL.

The selected High–Low participants showed a different pattern. They had relatively high Total A scores but lower Total B scores than the High–High participants. Their accounts showed explicit awareness of ChatGPT's limitations; however, this awareness was not always accompanied by clear evidence of sustained reflection or behavioral application. HL-02, for example, described using ChatGPT for work and self-reflection: "For work and self-reflection." (HL-02, translated from Indonesian). HL-02 also indicated a possible gap between receiving input and applying it: "I only get perspectives and input, but as for actually practicing it..." (HL-02, translated from Indonesian).

Because the second statement was incomplete, it is interpreted cautiously as suggesting a possible gap between obtaining perspectives and translating them into action. The

Medium–Medium profile reflected a more bounded and instrumental pattern, in which ChatGPT was used as an initial or supplementary resource while human support remained important. The Low–Low profile reflected limited engagement and a preference for immediate answers, while psychological concerns were directed toward trusted people or professionals.

Overall, the qualitative findings suggest that ChatGPT interaction did not automatically or uniformly translate into DMHL. Emotional engagement, critical awareness, reflective practice, and continued reliance on human support appeared in different combinations across the selected profiles. These findings provide possible qualitative explanations of the quantitative association, but the proposed processes were not statistically tested as causal mechanisms.

Table 2 summarizes the substantive qualitative categories identified across the interview accounts. The table is intended to provide an overview of the patterns described in the preceding narrative and should be interpreted together with the direct participant quotations. As summarized in Table 2, the participants' accounts reflected different combinations of emotional accessibility, relational closeness, critical awareness, instrumental use, and reflective practice. These categories were not distributed uniformly across the sampling profiles, indicating that similar levels of interaction did not necessarily correspond to identical experiences or uses of ChatGPT.

Tabel 2. Summary of Qualitative Categories Across Sampling Profiles

Qualitative Category	Main qualitative pattern	Supporting Informants	Relation to profile
ChatGPT as an accessible emotional interlocutor	ChatGPT was used as an immediate or situational conversational resource during emotional need	HH-01, MM-01	Most immediate in HH-01; more conditional in MM-01
Emotional engagement and perceived relational closeness	The AI–human boundary became less salient for one participant, whereas another maintained a clear distinction	HH-01, LL-01	Most immediate in HH-01; more conditional in MM-01
Critical awareness and reflective practice	Participants recognized that ChatGPT was not fully reliable or suitable for psychological matters	HL-01, HL-03	Explicitly evident in the selected HL participants
Instrumental use and continued human support	ChatGPT was used as initial or supplementary support while human relationships remained important	MM-01	Consistent with the bounded MM profile
Limited interaction and shallow processing	ChatGPT was used for immediate answers with limited further exploration; psychological concerns were directed to people or professionals	LL-01	Consistent with the selected LL profile
Divergent pathways between interaction and DMHL	Emotional engagement, critical awareness, and behavioral application did not appear in the same combination across profiles	HH-01, MM-01, LL-01, HL-01–HL-03	Indicates that interaction intensity alone does not explain the qualitative patterns

Cross Case Analysis: Patterns Across Participant Groups

The cross-case analysis compared how the substantive qualitative categories were expressed across the four sampling profiles. The comparison indicated that the profiles differed not only in the level of Social Interaction with ChatGPT and DMHL but also in the meaning participants assigned to ChatGPT, the role of human support, and the way they reflected on AI-generated information.

In the High–High profile, the available account of HH-01 emphasized immediate emotional accessibility and

perceived relational closeness. HH-01 described ChatGPT as a first response during distress and, at times, experienced the interaction as socially meaningful. The High–High profile had the highest Total A and Total B scores among the selected qualitative participants. However, this pattern should not be interpreted as evidence that emotionally meaningful interaction caused higher DMHL, because the study did not test causal pathways and the qualitative evidence was based on a small purposive sample.

The Medium–Medium profile showed a more bounded and situational pattern of use. MM-01 described using

ChatGPT when confused and continuing to rely on friends after emotional distress had subsided. This account suggests that ChatGPT functioned as an initial or supplementary resource rather than a substitute for human support. The score pattern of the Medium–Medium participants, which was close to the central tendency of the quantitative sample, was consistent with this more balanced form of engagement.

The Low–Low profile was represented by limited and predominantly instrumental use. LL-01 described ChatGPT as a tool for obtaining immediate answers and maintained a clear distinction between ChatGPT and human relationships. For psychological concerns, LL-01 preferred trusted people or professional support. This account was consistent with the relatively low Total A and Total B scores of the selected Low–Low participants. However, the interpretation should not be generalized to all participants with low scores because the available qualitative evidence was limited.

The High–Low profile showed the greatest divergence between interaction intensity and DMHL. HL-01 and HL-03 explicitly recognized that ChatGPT was a robot and was not fully reliable for psychological matters. HL-02 also described a possible gap between receiving perspectives from ChatGPT and applying them in practice. These accounts suggest that critical awareness of AI limitations may coexist with relatively high interaction but may not necessarily be accompanied by sustained reflection, verification, or behavioral application.

Overall, the cross-case comparison indicates that interaction intensity alone did not fully account for the qualitative patterns. Emotional accessibility, perceived relational closeness, instrumental use, critical awareness, continued human support, and reflective application appeared in different combinations across the selected profiles. These patterns provide qualitative context for the quantitative association between Social Interaction with ChatGPT and DMHL, but they should not be interpreted as statistically tested causal mechanisms.

Integration of Quantitative and Qualitative Findings

Data were integrated in both connecting and merging ways in accordance with the principles of an Explanatory Sequential Mixed Methods Design. The qualitative phase determined purposive selection of the participants in the connecting phase based on the quantitative findings. A combination display was then utilized to provide a systematic comparison and synthesis of the outcomes of the two stages to use the merging strategy (Fetters et al., 2013; Guetterman and Creswell, 2015). The quantitative and qualitative findings were integrated through a joint display to compare the score patterns of the selected interview participants with the substantive categories identified in their interview accounts. Table 3 presents areas of convergence, complementarity, and divergence across the four sampling profiles.

Table 3. Joint Display of Quantitative and Qualitative Findings Across the Sampling Profiles

Sampling Profile	Quantitative pattern among selected participants	Main qualitative findings	Integrated Interpretation
High-High	Total A = 115-120 Total B = 88-92	HH-01 described ChatGPT as an immediate source of emotional support and, at times, as relationally close	The high scores co-occurred with emotionally meaningful engagement. This pattern suggests that emotional accessibility and relational meaning may help explain higher reported DMHL in some participants, but it does not establish a causal mechanism.
Medium-Medium	Total A = 84-87 Total B = 69-72	MM-01 described ChatGPT as situational and supplementary, while continued communication with friends remained important	Scores near the central tendency were consistent with a bounded and instrumental pattern of use rather than dominant reliance on ChatGPT.
Low- Low	Total A = 41-61 Total B = 43-57	LL-01 used ChatGPT mainly for immediate answers, maintained a clear AI–human distinction, and preferred trusted people or professionals for psychological concerns	Lower scores co-occurred with limited engagement and minimal reported exploration of ChatGPT-derived information. This interpretation is based primarily on LL-01's account and should not be generalized to all Low–Low participants.
High-Low	Total A = 90-107 Total B = 50-69	HL-01 and HL-03 expressed awareness of ChatGPT's limitations; HL-02 described a possible gap between receiving perspectives and applying them	High interaction did not necessarily co-occur with high DMHL. Critical awareness appeared in the accounts, but it was not always accompanied by clear sustained reflection or behavioral application.

Table 3 shows that the quantitative and qualitative findings were partly convergent but not uniform across profiles. The High–High and Low–Low profiles showed broadly consistent score and interview patterns, whereas the High–Low profile highlighted an important divergence: relatively high interaction with ChatGPT co-occurred with lower DMHL scores despite explicit awareness of ChatGPT's limitations. This pattern suggests that awareness alone may not be sufficient for reflective or behavioral application of digital mental health information.

Meta Inference

The quantitative findings showed a positive association between Social Interaction with ChatGPT and DMHL in the full sample. The qualitative findings suggested that this association may be expressed through different processes across participants. Emotional accessibility and perceived relational closeness were evident in the account of HH-01, while MM-01 described bounded and instrumental use of ChatGPT alongside continued reliance on human support.

LL-01 described limited use and a clear preference for human or professional support for psychological concerns. The High–Low participants showed that frequent interaction could coexist with critical awareness of ChatGPT's limitations and lower DMHL scores.

Taken together, these findings suggest that the positive quantitative association did not represent a single uniform pathway. Emotional engagement, critical awareness, reflective practice, behavioral application, and continued human support appeared in different combinations across the selected profiles. These qualitative processes may help explain the observed association, but they were not statistically tested as mediators or causal mechanisms.

DISCUSSION

The present study examined the association between Social Interaction with ChatGPT and Digital Mental Health Literacy (DMHL) among Indonesian Generation Z participants and explored the qualitative processes that may help explain this association. The quantitative findings supported the study hypothesis: Social Interaction with ChatGPT was positively associated with DMHL. Pearson's correlation indicated a strong positive relationship, and the regression model showed that Social Interaction with ChatGPT accounted for 43.5% of the variance in DMHL. The corresponding Spearman correlation supported the same overall pattern despite the non-normal distribution of the variables. These findings indicate that participants who reported more extensive social interaction with ChatGPT also tended to report higher DMHL. However, the regression model also left 56.5% of the variance unexplained. Therefore, the findings should not be interpreted to mean that interaction with ChatGPT alone determines DMHL. This interpretation is consistent with broader conceptualizations of mental health literacy and digital health literacy as multidimensional competencies involving not only information access but also recognition, appraisal, relevance assessment, application, privacy awareness, and appropriate help-seeking (Ban et al., 2024; Jorm, 2012; van der Vaart & Drossaert, 2017). Evidence from Indonesia also suggests that mental health literacy can be strengthened through structured digital educational experiences, further indicating that literacy is shaped by multiple informational, educational, and contextual factors rather than technology exposure alone (Brooks et al., 2023).

The qualitative findings provided a more nuanced interpretation of this association. Rather than identifying one uniform process, the interviews suggested that participants engaged with ChatGPT in different ways. The selected High–High participants had the highest Total A and Total B scores among the qualitative participants. In the account of HH-01, ChatGPT was described as an immediately accessible resource during emotional distress and, at times, as relationally close. This finding is consistent with research suggesting that some users experience generative AI not only as an information source but also as a conversational space for reflection, reassurance, and emotional expression (Luo, Ghosh, et al., 2025; Luo, Wang, et al., 2025). It also resembles aspects of parasocial interaction, in which an individual experiences an affective sense of connection with a non-human or mediated entity perceived as responsive and nonjudgmental (Horton & Wohl, 1956; Brandtzaeg et al., 2022). Research on human–chatbot relationships similarly shows that perceived acceptance, understanding, nonjudgment, self-disclosure, and trust can contribute to the development of relational

closeness with conversational agents (Pentina et al., 2023; Skjuve et al., 2021, 2022). These findings support the interpretation that relational qualities of AI interaction may become psychologically meaningful even when users remain aware that the conversational partner is artificial.

Nevertheless, the High–High findings should be interpreted cautiously. The presence of emotionally meaningful engagement alongside high DMHL scores does not demonstrate that emotional engagement caused higher literacy. It is equally possible that participants with higher perceived literacy felt more confident using ChatGPT reflectively, or that other unmeasured characteristics contributed to both intensive interaction and higher DMHL. In addition, the DMHL measure relied on self-report and may capture perceived confidence in accessing and evaluating digital mental health information rather than objectively observed evaluative competence. This concern is important because self-report measures can be influenced by common-method bias and respondents' perceptions of their own capabilities (Podsakoff et al., 2003). The distinction between perceived and demonstrated competence is also recognized in digital health literacy research; for example, van der Vaart and Drossaert (2017) distinguished self-reported digital health literacy from performance-based tasks and showed that perceived skills cannot simply be assumed to represent objectively demonstrated competence.

Evidence from emerging research on AI-mediated mental health support further reinforces the need for this caution. McBain et al. (2026) found that 91.7% of adolescents and young adults who used AI chatbots for mental health advice rated the advice as at least somewhat helpful, while most did not disclose their chatbot use to others. Importantly, perceived helpfulness should not be equated with independently established accuracy or clinical appropriateness. Research on online health information more broadly has documented considerable variability in information quality and has emphasized that users' ability to evaluate reliability and credibility is an essential component of health literacy (Daraz et al., 2019; Diviani et al., 2015; van der Vaart & Drossaert, 2017). Thus, the High–High pattern should be understood as an association between elevated self-reported DMHL and emotionally meaningful engagement rather than evidence that emotional reliance on ChatGPT is inherently beneficial.

This caution is especially relevant because emotional closeness to conversational AI can have both supportive and potentially problematic implications. Studies of social chatbots have documented experiences of emotional support, acceptance, and relational attachment, but they have also identified cases in which emotional dependence was associated with perceived mental health harms (Laestadius et al., 2024; Skjuve et al., 2021). Longitudinal evidence concerning AI dependence also suggests that the direction of association is complex: Huang et al. (2024) found that pre-existing mental health problems predicted subsequent AI dependence among adolescents, whereas AI dependence did not prospectively predict later mental health problems in their cross-lagged analysis. Consequently, emotional engagement should be treated as a contextual and relational characteristic of AI use rather than automatically interpreted as either beneficial or harmful.

The Medium–Medium profile provided a contrasting pattern of more bounded and instrumental use. MM-01 described using ChatGPT when confused and continuing to talk with friends after emotional distress had subsided. This suggests that ChatGPT may serve as an initial or supplementary resource without displacing human support.

Such use is consistent with the role of digital tools as accessible sources of preliminary information, reflection, or reassurance, while interpersonal relationships remain important for emotional support and decision-making. Studies of human–chatbot relationships have similarly shown that the effects of AI companionship on users' broader social contexts are heterogeneous and that conversational agents may supplement rather than necessarily replace human relationships (Skjuve et al., 2021, 2022). This distinction is particularly relevant to mental health literacy because appropriate help-seeking and knowledge of professional support are central components of mental health literacy rather than peripheral outcomes (Jorm, 2012).

This interpretation is also relevant to digital health literacy frameworks, which emphasize not only access to information but also the ability to evaluate and use information appropriately within real-life contexts (Norman & Skinner, 2006; Neter & Brainin, 2012; Ban et al., 2024). More recent multidimensional approaches similarly identify information searching, evaluating reliability and relevance, and protecting privacy as distinct digital health literacy competencies (van der Vaart & Drossaert, 2017). The Medium–Medium pattern therefore suggests that a balanced relationship between AI-mediated support and human support may be one context in which ChatGPT is used without becoming the dominant source of psychological guidance. In the Indonesian context, evidence that structured digital interventions can improve mental health literacy and self-management among young people further supports the importance of combining digital resources with educational and supportive environments (Brooks et al., 2023).

The Low–Low profile showed a different pattern. LL-01 described ChatGPT as a tool for obtaining immediate answers and reducing the effort required to think through a problem, while preferring trusted friends or psychologists for psychological concerns. This account suggests limited engagement with ChatGPT-derived information and a clearer distinction between instrumental assistance and human or professional support. The pattern is broadly consistent with the lower Total A and Total B scores of the selected Low–Low participants. However, this interpretation must remain limited to the available interview accounts and should not be generalized to all participants with low scores. Low interaction with ChatGPT does not necessarily imply poor digital mental health literacy, as individuals may develop literacy through other sources, including education, prior knowledge, interpersonal support, professional guidance, or exposure to reliable health information. Mental health literacy research has long emphasized that recognition, knowledge of available professional and self-help options, and appropriate help-seeking are acquired through multiple informational and social channels (Jorm, 2012), while digital intervention research in Indonesia demonstrates that formal educational resources can also strengthen mental health knowledge and self-management independently of generative AI use (Brooks et al., 2023). The absence of a Low–High participant in the qualitative interview sample therefore limits the present study's ability to examine this possibility directly.

The High–Low profile was particularly important because it demonstrated that relatively high interaction with ChatGPT did not necessarily co-occur with higher DMHL. The selected High–Low participants had Total A scores ranging from 90 to 107 but Total B scores ranging from 50 to 69. Their accounts showed explicit awareness

that ChatGPT was a robot, that its responses should not be accepted uncritically, and that it was not fully trusted for psychological matters. However, the interviews also suggested a possible gap between recognizing these limitations and consistently translating that recognition into reflection, verification, or behavioral application. This pattern is consistent with the broader distinction between awareness and enactment: knowing that information may be unreliable is not identical to actively evaluating sources, comparing information, or using it appropriately in real-world decisions. Digital health literacy frameworks similarly conceptualize literacy as a set of applied competencies involving access, understanding, appraisal, and use, rather than awareness alone (Norman & Skinner, 2006; Neter & Brainin, 2012; Ban et al., 2024). The Digital Health Literacy Instrument further separates evaluating reliability and determining relevance from more basic operational and information-searching competencies, supporting the argument that recognizing potential unreliability and actually evaluating information are distinct skills (van der Vaart & Drossaert, 2017).

This finding adds nuance to interpretations of critical awareness in AI-mediated contexts. The High–Low accounts do not show that critical awareness is unimportant. Rather, they suggest that awareness may be necessary but insufficient when it is not accompanied by sustained reflective practice or appropriate action. This interpretation is compatible with literature suggesting that the use of digital mental health technologies requires more than functional access; users must also be able to evaluate relevance, credibility, limitations, and appropriate next steps (Koulouri et al., 2022; Hawkins et al., 2025). Systematic reviews of online health information similarly demonstrate that lower health literacy is associated with difficulties in evaluating digital information and that online health information itself varies considerably in quality (Daraz et al., 2019; Diviani et al., 2015). These findings strengthen the distinction between simply knowing that AI can be inaccurate and possessing the practical skills required to check, compare, contextualize, and appropriately use AI-generated information. However, the present study did not measure information-verification behavior directly. Therefore, the proposed gap between awareness and application should be interpreted as a qualitative pattern requiring further empirical testing.

Taken together, the mixed-methods findings suggest that the positive quantitative association between Social Interaction with ChatGPT and DMHL does not represent a single uniform pathway. Across the selected profiles, emotional accessibility, perceived relational closeness, instrumental use, continued reliance on human support, critical awareness, and reflective application appeared in different combinations. Such heterogeneity is consistent with longitudinal and mixed-methods research showing substantial variation in how human–chatbot relationships form and how trust, self-disclosure, interaction intensity, anthropomorphism, and relational motivations operate across users (Pentina et al., 2023; Skjuve et al., 2021, 2022). At the same time, evidence of possible harms associated with emotional dependence indicates that relational closeness should not automatically be regarded as an indicator of adaptive use (Laestadius et al., 2024). This finding therefore expands conventional accounts of digital health literacy by suggesting that AI-mediated information practices occur within a relational and emotional context in addition to a cognitive one. These relational dimensions should not, however, be interpreted as substitutes for critical appraisal. A participant may feel understood by ChatGPT, recognize its limitations, or use it frequently, yet

still differ substantially in how information is verified and applied.

Theoretically, the findings suggest that DMHL in AI-mediated settings may be conceptualized as a multidimensional set of competencies operating within a broader relational context. Existing eHealth and digital health literacy models emphasize the ability to access, understand, evaluate, and use health information (Ban et al., 2024; Neter & Brainin, 2012; Norman & Skinner, 2006; van der Vaart & Drossaert, 2017), whereas mental health literacy additionally emphasizes recognition of mental health problems, knowledge of self-help and professional interventions, attitudes facilitating help-seeking, and knowledge of how to obtain appropriate mental health information (Jorm, 2012). The present findings suggest that, in the context of generative AI, these competencies may operate alongside users' emotional experiences and perceived social relationships with the system. This does not require extending the definition of DMHL to include emotional attachment as a literacy competency. Rather, emotional engagement may constitute a contextual condition that influences how users seek, interpret, trust, scrutinize, and act on AI-generated mental health information. Research on conversational agents supports the relevance of such relational conditions by demonstrating the roles of trust, self-disclosure, perceived acceptance, anthropomorphism, and relational closeness in sustained human–AI interaction (Pentina et al., 2023; Skjuve et al., 2021, 2022). Future research should test these propositions using validated measures of emotional attachment or parasocial interaction, performance-based indicators of information verification, and longitudinal designs capable of distinguishing temporal directionality.

The findings also have practical implications. Digital mental health literacy education should not focus exclusively on identifying misinformation or evaluating the factual accuracy of online content. Educational programs may also need to address how users experience emotional comfort, perceived nonjudgment, and relational closeness when interacting with generative AI. Such programs can encourage users to distinguish between emotional expression, informational guidance, and professional mental health support. They may also promote practical habits such as cross-checking important mental health information, discussing concerns with trusted people, and seeking qualified professional help when symptoms are severe, persistent, or associated with risk. The aim is not to discourage all use of ChatGPT for reflection or preliminary information, but to support use that is critical, bounded, and connected to appropriate human support.

Several limitations should be considered when interpreting the findings. First, the quantitative component was cross-sectional and correlational; therefore, the direction of the association between Social Interaction with ChatGPT and DMHL cannot be determined. Second, both constructs were measured through self-report instruments, which may reflect perceived competence and perceived interaction rather than objectively observed skills or behaviors. Third, the qualitative component involved only twelve purposively selected participants, limiting the transferability of the qualitative findings to other Generation Z users, geographic contexts, and interaction patterns. Fourth, the qualitative sample did not include a Low–High profile. As a result, the study could not directly explore how high DMHL may develop among individuals with limited interaction with ChatGPT. Fifth, qualitative coding was conducted by a single researcher without formal inter-rater reliability procedures. Finally, emotional engagement, critical awareness, reflective practice, and

behavioral application were interpreted from interview accounts rather than statistically tested as mediating or moderating mechanisms.

Future studies should address these limitations by using longitudinal or experimental designs to examine temporal directionality, recruiting larger and more diverse samples, and intentionally including Low–High participants. Future work should also combine self-report instruments with objective tasks that assess how users verify AI-generated mental health information, distinguish AI support from professional guidance, and apply information in realistic decision-making contexts. Measures of emotional attachment, parasocial interaction, perceived social presence, and reliance on human support could further clarify how relational experiences with AI intersect with DMHL. Such work would help determine whether the processes identified in the present study are stable patterns, context-specific experiences, or pathways that vary across users and forms of AI interaction.

In summary, this study found a positive association between Social Interaction with ChatGPT and DMHL among Indonesian Generation Z participants. The qualitative findings indicate that this association may be expressed through diverse patterns of emotional accessibility, relational meaning, critical awareness, reflective practice, and continued reliance on human support. The findings do not establish causal mechanisms, but they suggest that understanding digital mental health literacy in AI-mediated environments requires attention to both cognitive and relational aspects of user experience.

CONCLUSION

This study found a positive association between Social Interaction with ChatGPT and DMHL among Indonesian Generation Z participants. The qualitative findings suggested that this association may involve different processes rather than a single uniform pathway. The selected High–High participants described immediate emotional accessibility and perceived relational closeness with ChatGPT. The Medium–Medium profile reflected a more bounded and instrumental use of ChatGPT alongside continued reliance on human support. The Low–Low profile reflected limited engagement and a preference for human or professional support for psychological concerns. The High–Low profile demonstrated that relatively high interaction could coexist with lower DMHL scores, critical awareness of ChatGPT's limitations, and a possible gap between receiving insight and applying it in practice.

These findings indicate that interaction intensity, emotional engagement, critical awareness, reflective practice, and continued human support should be considered together when studying DMHL in AI-mediated environments. The qualitative processes identified in this study are exploratory and should not be interpreted as statistically established causal mechanisms.

DECLARATION

Ethics approval and consent to participate

The study was conducted in accordance with ethical principles for research involving human participants, including respect for participants' autonomy, voluntary participation, confidentiality, and data privacy. Before participating in the study, all participants received complete

information about the research objectives, procedures, potential risks and benefits, confidentiality of their responses, and their right to withdraw from the study at any time without consequences. Electronic informed consent was obtained from all participants before data collection.

Consent for Publication

Not applicable. This manuscript does not contain any identifiable personal information, images, or individual data requiring consent for publication.

Availability of Data and Materials

The datasets generated and analyzed during the current study are not publicly available to protect participants' privacy and confidentiality. However, the data are available from the corresponding author upon reasonable request for academic purposes.

Competing Interests

The authors declare that they have no competing interests.

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Artificial Intelligence-Assisted Technology Statement

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) solely to assist with language refinement, grammar improvement, and enhancing of the clarity of academic writing. Artificial intelligence was not used for conceptualizing the research, design the methodology, collect or analyze data, interpreting the findings, or drawing research conclusions. The authors carefully reviewed and edited all AI-assisted outputs and assumed full responsibility for the accuracy, integrity, and originality of the manuscript.

Authors' Contributions

Igriya Fauzi Nabilah: Conceptualization, methodology, investigation, data collection, formal analysis, data interpretation, visualization, writing original draft, and manuscript revision.

Wihda Maulani: Supervision, methodology validation, interpretation of findings, writing review and editing.

Amelia Putri Nirmala: Supervision, critical review of the manuscript, writing review and editing, and final approval of the manuscript.

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REFERENCES

- Asosiasi Penyelenggara Jasa Internet Indonesia. (2025). *Survei profil internet Indonesia 2025*.
- Ban, S., Kim, Y., & Seomun, G. (2024). Digital health literacy: A concept analysis. *Digital Health*, 10, Article 20552076241287894. <https://doi.org/10.1177/20552076241287894>
- Brandtzaeg, P. B., Skjuve, M., & Følstad, A. (2022). My AI friend: How users of a social chatbot understand their human-AI friendship. *Human Communication Research*, 48(3), 404–429. <https://doi.org/10.1093/hcr/hqac008>
- Brooks, H., Irmansyah, I., Syarif, A. K., Pedley, R., Renwick, L., Rahayu, A. P., Manik, C., Prawira, B., Hann, M., Brierley, H., Lovell, K., & Bee, P. (2023). Evaluating a prototype digital mental health literacy intervention for children and young people aged 11–15 in Java, Indonesia: A mixed method, multi-site case study evaluation. *Child and Adolescent Psychiatry and Mental Health*, 17(1), Article 79. <https://doi.org/10.1186/s13034-023-00608-9>
- Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). SAGE Publications.
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.
- Daraz, L., Morrow, A. S., Ponce, O. J., Beuschel, B., Farah, M. H., Katabi, A., Alsawas, M., Majzoub, A. M., Benkhadra, R., Seisa, M. O., Ding, J. F., Prokop, L., & Murad, M. H. (2019). Can patients trust online health information? A meta-narrative systematic review addressing the quality of health information on the Internet. *Journal of General Internal Medicine*, 34(9), 1884–1891. <https://doi.org/10.1007/s11606-019-05109-0>
- Diviani, N., van den Putte, B., Giani, S., & van Weert, J. C. M. (2015). Low health literacy and evaluation of online health information: A systematic review of the literature. *Journal of Medical Internet Research*, 17(5), Article e112. <https://doi.org/10.2196/jmir.4018>
- Fang, C. M., Liu, A. R., Danry, V., Lee, E., Chan, S. W. T., Pataranutaporn, P., Maes, P., Phang, J., Lampe, M., Ahmad, L., & Agarwal, S. (2025). *How AI and human behaviors shape psychosocial effects of chatbot use: A longitudinal randomized controlled study* [Preprint]. arXiv. <https://doi.org/10.48550/arXiv.2503.17473>
- Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs: Principles and practices. *Health Services Research*, 48(6, Pt. 2), 2134–2156. <https://doi.org/10.1111/1475-6773.12117>

- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine Publishing Company.
- Guetterman, T. C., Fetters, M. D., & Creswell, J. W. (2015). Integrating quantitative and qualitative results in health science mixed methods research through joint displays. *The Annals of Family Medicine*, 13(6), 554–561. <https://doi.org/10.1370/afm.1865>
- Hawkins, A., Taba, M., Caldwell, P. H. Y., Kang, M., Skinner, S. R., McCaffery, K., & Scott, K. M. (2025). Enhancing digital health literacy in adolescents: Evaluation of a co-designed educational app. *BMC Public Health*, 25, Article 3869. <https://doi.org/10.1186/s12889-025-25022-y>
- Herbener, A. B., & Damholdt, M. F. (2025). Are lonely youngsters turning to chatbots for companionship? The relationship between chatbot usage and social connectedness in Danish high-school students. *International Journal of Human-Computer Studies*, 196, Article 103409. <https://doi.org/10.1016/j.ijhcs.2024.103409>
- Horton, D., & Wohl, R. R. (1956). Mass communication and para-social interaction: Observations on intimacy at a distance. *Psychiatry*, 19(3), 215–229. <https://doi.org/10.1080/00332747.1956.11023049>
- Huang, S., Lai, X., Ke, L., Li, Y., Wang, H., Zhao, X., Dai, X., & Wang, Y. (2024). AI technology panic—is AI dependence bad for mental health? A cross-lagged panel model and the mediating roles of motivations for AI use among adolescents. *Psychology Research and Behavior Management*, 17, 1087–1102. <https://doi.org/10.2147/PRBM.S440889>
- Jayatissa, K. A. D. U. (2023). Generation Z-A new lifeline: A systematic literature review. *Sri Lanka Journal of Social Sciences and Humanities*, 3(2), 179–186. <https://doi.org/10.4038/sljssh.v3i2.110>
- Jorm, A. F. (2012). Mental health literacy: Empowering the community to take action for better mental health. *American Psychologist*, 67(3), 231–243. doi: 10.1037/a0025957. DOI record
- Koulouri, T., Macredie, R. D., & Olakitan, D. (2022). Chatbots to support young adults' mental health: An exploratory study of acceptability. *ACM Transactions on Interactive Intelligent Systems*, 12(2), Article 11. <https://doi.org/10.1145/3485874>
- Laestadius, L., Bishop, A., Gonzalez, M., Illenčik, D., & Campos-Castillo, C. (2024). Too human and not human enough: A grounded theory analysis of mental health harms from emotional dependence on the social chatbot Replika. *New Media & Society*, 26(10), 5923–5941. <https://doi.org/10.1177/14614448221142007>
- Luo, X., Ghosh, S., Tilley, J. L., Besada, P., Wang, J., & Xiang, Y. (2025a). "Shaping ChatGPT into my digital therapist": A thematic analysis of social media discourse on using generative artificial intelligence for mental health. *Digital Health*, 11, Article 20552076251351088. <https://doi.org/10.1177/20552076251351088>
- Luo, X., Wang, Z., Tilley, J. L., Balarajan, S., Bassey, U. A., & Cheang, C. I. (2025b). Seeking emotional and mental health support from generative AI: Mixed-methods study of ChatGPT user experiences. *JMIR Mental Health*, 12, Article e77951. <https://doi.org/10.2196/77951>
- McBain, R. K., Cantor, J. H., Breslau, J., Diliberti, M., Zhang, L. A., Zhang, F., Burnett, A., Kofner, B., Pataranutaporn, P., Stein, B. D., Mehrotra, A., & Yu, H. (2026). AI chatbot use and disclosure for mental health among US adolescents and young adults. *JAMA Pediatrics*, 180(8), 884–890. <https://doi.org/10.1001/jamapediatrics.2026.2015>
- Neter, E., & Brainin, E. (2012). eHealth literacy: Extending the digital divide to the realm of health information. *Journal of Medical Internet Research*, 14(1), Article e19. <https://doi.org/10.2196/jmir.1619>
- Norman, C. D., & Skinner, H. A. (2006). eHealth literacy: Essential skills for consumer health in a networked world. *Journal of Medical Internet Research*, 8(2), Article e9. <https://doi.org/10.2196/jmir.8.2.e9>
- Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS* (7th ed.). Routledge.
- Pentina, I., Hancock, T., & Xie, T. (2023). Exploring relationship development with social chatbots: A mixed-method study of Replika. *Computers in Human Behavior*, 140, Article 107600. <https://doi.org/10.1016/j.chb.2022.107600>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Rahsepar Meadi, M., Sillekens, T., Metselaar, S., van Balkom, A., Bernstein, J., & Batelaan, N. (2025). Exploring the ethical challenges of conversational AI in mental health care: Scoping review. *JMIR Mental Health*, 12, Article e60432. <https://doi.org/10.2196/60432>
- Rudianto, Z. N. (2022). Pengetahuan generasi Z tentang literasi kesehatan dan kesadaran mental di masa pandemi. *Jurnal Pendidikan Kesehatan*, 11(1), 49–72. <https://doi.org/10.31290/jpk.v11i1.2843>
- Skjuve, M., Følstad, A., Fostervold, K. I., & Brandtzaeg, P. B. (2021). My chatbot companion—A study of human–chatbot relationships. *International Journal of Human-Computer Studies*, 149, Article 102601. <https://doi.org/10.1016/j.ijhcs.2021.102601>
- Sundar, S. S. (2020). Rise of machine agency: A framework for studying the psychology of human–AI interaction (HAI). *Journal of Computer-Mediated Communication*, 25(1), 74–88. <https://doi.org/10.1093/jcmc/zmz026>
- Tashakkori, A., & Teddlie, C. (Eds.). (2010). *SAGE handbook of mixed methods in social & behavioral research* (2nd ed.). SAGE Publications. <https://doi.org/10.4135/9781506335193>
- van der Vaart, R., & Drossaert, C. (2017). Development of the Digital Health Literacy Instrument: Measuring a broad spectrum of Health 1.0 and Health 2.0 skills. *Journal of Medical Internet Research*, 19(1), Article e27. <https://doi.org/10.2196/jmir.6709>

ADDITIONAL INFORMATION

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