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Determinants of Intentions to Use Digital Mental Healthcare Content among University Students, Faculty, and Staff: Motivation, Perceived Usefulness, Perceived Ease of Use, and Parasocial Interaction with AI Chatbot

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Abstract: Depression is a worldwide health issue to which various physical, psychological, and social health problems are attributable. To address the issue through the promotion of digital mental healthcare content use, this study examines factors influencing people's intentions to use the content, guided by the technology acceptance model and uses and gratifications theory. A total of 278 students and faculty/staff members at a Korean university tried using a digital mental healthcare content (e.g., artificial intelligence chatbot content) called MyMentalPocket and completed a survey questionnaire associated with their perceptions of the content. Participants' depression levels, perceived usefulness, and parasocial interactions emerged as significant and positive factors influencing people's intentions to use MyMentalPocket. Female gender, younger age, and specific motives for depression-related digital technology use (i.e., communication and emotional support, information- and guidance-seeking, and habitual entertainment-seeking motives) emerged as significant and positive factors influencing parasocial interactions. Parasocial interactions and perceived ease of use emerged as significant and positive factors influencing perceived usefulness. The findings from this study imply the utility of AI chatbots as a way to help people, especially females and younger people with depression and interpersonal difficulties, to utilize and benefit from digital mental healthcare content for depression management.

Keywords: depression; eHealth; mHealth; digital mental healthcare content; artificial intelligence chatbot; technology acceptance model; uses and gratifications theory

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1. Introduction

Depression is a critical public health issue across the world [1]. Among Organisation for Economic Co-operation and Development countries, the highest prevalence of depression is observed in South Korea. Approximately four out of 10 South Koreans are at risk for negative physical (e.g., sleep disturbance), psychological (e.g., suicidal ideation), and social (e.g., difficulty in interpersonal functioning) consequences of depression [2,3]. Very few of them (less than 5%), however, report using mental healthcare services [4]. Preventable economic loss at the national level is attributable to depression, accounting for healthcare costs of $152 million [5] and $122 billion in gross domestic product [6]. Digital mental healthcare content (e.g., app-based mental health treatment programs) [7] shows promise in addressing the depression crisis in South Korea. The content can be used at a minimal cost, with less stigma associated with mental healthcare, and in timesaving and less space-constrained manners [8–10]. In addition, there is evidence that the content helps reduce depressive symptoms [7,11–14]. Furthermore, people with depression who voluntarily and independently use the content report better progress in depression management than

those receiving healthcare provider-supported interventions [7,15]. These reports suggest there is a need to examine factors that motivate people's use of digital mental healthcare content [16] in order to gain insights into the design of interventions that promote their voluntary and continuous use of the content and increase therapeutic effects. To do so, this study applies the technology acceptance model (TAM) [17,18] and uses and gratifications theory (UGT) [19] to examine factors that may influence people's adoption and use of digital mental healthcare content.

TAM, focusing on determinants of people's technology acceptance, is a logical theoretical framework that helps understand people's acceptance of digital mental healthcare content. TAM describes that people's technology use is influenced by their intentions to use the technology, and motivational factors influence the intentions [20]. Perceived usefulness—one of the motivational factors—is defined as the extent to which people find a technology to be a facilitator of their work [17], and perceived usefulness positively influences intentions to use mobile health (mHealth) apps [21]. Schuller et al. [22] describe that the acceptance of mHealth apps is not a simple process for people in need of mental healthcare. It involves careful reviews and comparisons of multiple apps, identifying the features they seek, and, in turn, determining whether or not to use a specific app. People might become willing to use digital mental healthcare content when they think its features provide relative advantages that could supplement or substitute their current strategies for depression management [23].

Perceived ease of use—another factor that influences intentions to use a technology—is defined as the extent to which people think a technology is not a struggle to use [17], and perceived ease of use is positively related to intentions to use mHealth apps [24]. People have described that their intentions to use mental health apps depend on perceived ease of use, i.e., feeling at ease navigating and using them as part of their daily lives [25,26]. Depression is represented by cognitive difficulties, such as poor concentration and executive functions [3,27,28], that might hinder people from flexibly using mHealth apps, such as having difficulty in responding to errors or in using features not responsive when touching or scrolling up and down a screen. It suggests that in deciding on the acceptance of digital mental healthcare content, perceived ease of use might be more important to people with depression, when compared to the general population, whose interest in and willingness to use technology would be otherwise discouraged. Existing studies have also indicated that the perceived ease of use positively influences perceived usefulness [29–31], suggesting that perceived ease of use might be the first stepping stone for people in learning about the value of integrating digital mental healthcare content into their depression management.

UGT, along with TAM, helps understand people's acceptance of technologies. UGT focuses on people's instrumental (more active, purposive, and media content-focused) and ritualized (less active and less focused on the content) needs, i.e., motives for using specific media [32–34], such as health-related information (instrumental) or something to pass time (ritualized) that people seek on YouTube [35]. Existing studies have reported barriers to mental healthcare, such as people's perceived stigma surrounding help-seeking behavior, time constraints, and costs [36,37]. In contrast, in one study conducted in South Korea, mental health literacy (e.g., being able to know how to receive mental healthcare) and social support (e.g., informational, emotional, appraisal, tangible) [38] were found to be facilitators of mental healthcare, helping mitigate the stigma, improving attitudes toward help-seeking behavior, and, thereby, increasing the levels of help-seeking intentions [39]. These reports suggest that understanding people's motives—such as addressing specific barriers to or seeking facilitators of mental healthcare—could help understand their acceptance levels of digital mental healthcare content. Additionally, people would find the content helping meet their specific needs to be useful, thus motives could also help explain perceived usefulness [40].

In addition to people's motives for media use, UGT describes people's affective involvement with media content or parasocial interactions. Parasocial interactions refer to a friendship in which media characters become imaginary friends with or guides to

media users [41–43], and intimate parasocial interactions positively influence intentions to use electronic health (eHealth) technology as a channel to continue the interactions [44]. Parasocial interactions are an indicator of depressive symptoms for those with relational difficulties [45]. People with depression are willing to take the lead in making decisions on depression management [46], but due to the relational difficulties and stigma associated with mental healthcare, they might feel comfortable working on depression management online [47] and with strangers who do not know them well [48] (those other than family members, friends, and healthcare providers).

An artificial intelligence (AI) chatbot could possibly be a positive stranger or parasocial interactor, for example, with which people can communicate about and receive support for depression management at their convenience without acquaintance and commitment as prerequisites (e.g., setting up and attending appointments for in-person treatment sessions on a regular basis). The sociability of AI chatbots might enhance such potentially positive perceptions, considering previous reports that parasocial interactions with sociable AI chatbots positively influence users' satisfaction with and active use of the website where the chatbots are present [49]. The sociability of AI chatbots might especially matter to people with depression, sensitive to misleading negative feedback [50], in deciding whether to continue collaboration with the chatbots on symptom management. Taken together, people might become willing to use digital mental healthcare content when they find an AI chatbot there to be friendly and helpful and make them feel listened to and understood in depression management.

Parasocial interactions could also help explain heightened perceived usefulness. One study, for example, suggests that parasocial interactions with a shopping medium lead people to positively evaluate the product the medium recommends [51]. In addition, another study identified a positive relationship between parasocial interactions in online travel communities and community users' satisfaction with travel [52]. These reports suggest that people who consider an AI chatbot their friend, advocate, or guide in managing depression might find the digital mental healthcare content it provides to be caring, supportive, and persuasive.

In addition, specific motives for media use could help explain why people would engage in parasocial interactions. For instance, in one study on social media, expressive information-seeking and companionship motives were positively related to parasocial interactions—a positive predictor of a sense of community—among Instagram users [53]. On the other hand, for people with information needs, parasocial interactions with TV characters might be a source from which they obtain guidance and advice [54]. In addition, people might engage in parasocial interactions because of interesting and entertaining content provided by media characters such as YouTube unboxers [55] and tourism vloggers [56]. Considering these reports, people might differ in the extent to which they engage in parasocial interactions, for example, with an AI chatbot, depending on whether or not it helps meet their specific needs associated with depression management.

Research Questions and Hypotheses

In understanding factors motivating people's acceptance of digital mental healthcare content, five hypotheses and three research questions stemmed from the literature review. This study hypothesized that perceived usefulness will be positively related to intentions to use digital mental healthcare content (H1); perceived ease of use will be positively related to intentions to use digital mental healthcare content (H2); perceived ease of use will be positively related to perceived usefulness (H3); parasocial interactions will be positively related to intentions to use MyMentalPocket (H4) and parasocial interactions will be positively related to perceived usefulness (H5).

In addition, this study explored what people's motives are for depression-related digital technology use (e.g., websites, smartphone apps) (RQ1); what specific motives for depression-related digital technology use are related to perceived usefulness (RQ2) and

what specific motives for depression-related digital technology use are related to parasocial interactions (RQ3). Table S1 provides a summary of the literature review.

2. Methods

2.1. Participants and Procedures

This study was conducted at a Korean university after obtaining the university's institutional review board approval. The study focused on surveying students, faculty, and staff members. The existing report indicated the prevalence of depression within this population, with approximately three out of 10 students, faculty, and staff members reporting severe levels of stress and depression [36]. Undergraduates/graduate students and faculty/staff members aged 18 to 65 years and throughout the university facilities (e.g., library) were introduced to the purpose of the study and asked to complete a survey questionnaire written in Korean. Participants were informed that the survey was voluntary and anonymous. Participants were informed that they could give consent to take part in the study by voluntarily submitting their questionnaire. Participants were informed that they can withdraw their consent anytime and that their survey data would be removed immediately after the withdrawal. Since the survey was anonymous, each participant was provided with their questionnaire number to be used, instead of any identifying information, to contact the researchers and withdraw from the study (i.e., requesting the removal of survey data to which the questionnaire number is linked).

The survey began with measuring participants' demographic variables and motives for depression-related digital technology use (e.g., websites, and smartphone apps). Next, using a smartphone, a personal computer (PC), or a tablet PC, participants were asked to try using "MyMentalPocket," digital mental healthcare content that the HY Digital Healthcare Center at Hanyang University, South Korea, is taking the lead in developing as part of the South Korea Ministry of Science and ICT-funded research on digital content for personalized depression management [57,58]. MyMentalPocket provides features such as "Pocky," an AI chatbot showing empathy for users, guiding them through depression management, and suggesting wellness games designed to help diagnose depression and its indicators including cognitive control and sensitivity to positive/negative social feedback (see Figure 1) [57].

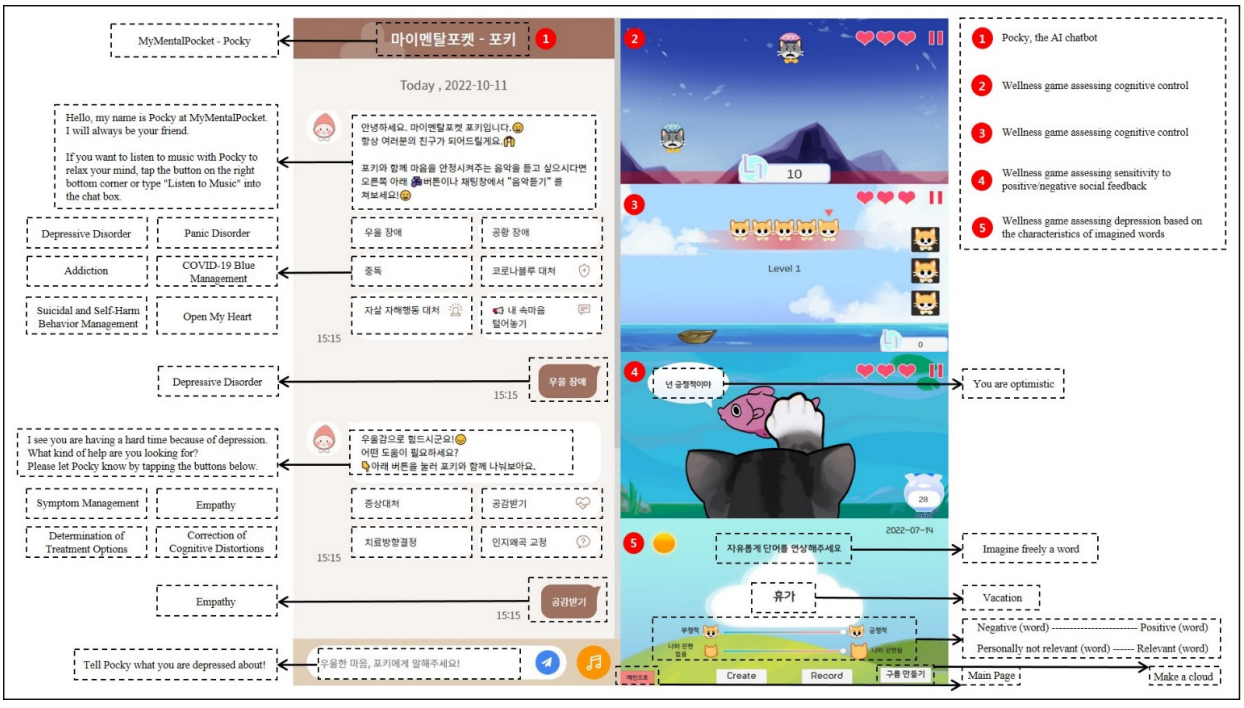

Figure 1. Screenshot of MyMentalPocket (left: Pocky, the AI chatbot; right: wellness game content).

Then the survey measured the perceived usefulness of MyMentalPocket, perceived ease of use, parasocial interactions, and intentions to use MyMentalPocket (see Table S2). The survey took approximately 20 min to complete. A gift card was offered to participants who completed the survey.

2.2. Measurements

The following TAM and UGT variables were measured on a 5-point Likert-type scale (from 1 = strongly disagree to 5 = strongly agree). To create each variable scale for data analysis, each variable item score was summed and averaged. In addition, Cronbach's alpha, a reliability indicator of each variable scale, was checked.

Motives for depression-related digital technology use. Before trying to use the MyMentalPocket features, the participants' current/future motives for depression-related digital technology use (e.g., websites, smartphone apps) were measured using items adapted from previous research [35,59–61]. Participants reported the extent to which they agree with thirty-six items describing various reasons for (needs associated with) using specific websites or smartphone apps, such as "to get information or advice to manage depression".

Perceived usefulness. Perceived usefulness was measured using items adapted from Davis's [17] study. Participants reported the extent to which they agree with eight items such as "I would find MyMentalPocket useful for depression care". A perceived usefulness scale reflected an acceptable internal consistency (M = 3.54, SD = 0.78, α = 0.91), and higher scale scores indicated higher levels of perceived usefulness.

Perceived ease of use. Perceived ease of use was measured using items adapted from Davis's [17] study. Participants reported the extent to which they agree with five items such as "I find MyMentalPocket to be easy to use". A perceived ease of use scale reflected an acceptable internal consistency (M = 4.07, SD = 0.77, α = 0.93), and higher scale scores indicated higher levels of perceived ease of use.

Parasocial interactions. Parasocial interactions with Pocky, the AI chatbot, were measured using items adapted from the Working Alliance Inventory-Short Revised scale [62] and its Korean version [63], and Rubin et al.'s [43] study. Participants reported the extent to which they agree with nine items such as "Pocky makes me feel comfortable, as if I am with friends," "Pocky and I collaborate on setting goals for depression management," and "Pocky and I are working toward mutually agreed upon goals for depression management". A parasocial interaction scale reflected an acceptable internal consistency (M = 3.27, SD = 0.86, α = 0.93), and higher scale scores indicated higher levels of parasocial interactions.

Intentions to use MyMentalPocket. Intentions to use MyMentalPocket were measured using items adapted from previous research [64–66]. Participants reported the extent to which they agree with six items such as "I intend to use MyMentalPocket in the future". An intentions scale reflected an acceptable internal consistency (M = 3.03, SD = 0.96, α = 0.95), and higher scale scores indicated higher levels of intentions.

Control variables. Demographic variables, such as age and gender, have been associated with people's technology acceptance [67–69]. In addition, it was found that people's depression levels influence people's depression management, such as their preference for treatment options and help-seeking intentions [47]. This study controlled the possible effects of these variables on the potential determinants of people's intentions to use MyMentalPocket (i.e., TAM and UGT variables). People's depression levels were measured using items from a Korean version [70] of the Patient Health Questionnaire-9 (PHQ-9), a validated depression screening tool [71,72]. On a 4-point Likert-type scale (from 0 = not at all to 3 = nearly every day), participants marked their agreement on nine items such as "little interest or pleasure in doing things". Item scores were summed for data analysis, and higher scores indicated more severe levels of depression [71].

2.3. Data Analysis

The data were analyzed using SPSS 27 (IBM Inc., USA). An exploratory factor analysis was performed to answer RQ1, identifying people's motives for depression-related digital

technology use. Pearson product-moment correlation along with hierarchical multiple regression analyses were performed to test H1-5 and answer RQ2-3, ascertaining relationships between the motives, perceived usefulness, perceived ease of use, parasocial interactions, and intentions to use MyMentalPocket.

3. Results

3.1. Participant Characteristics

The sample for this study consisted of 278 students (92%, 256/278) and faculty and staff members (8%, 22/278). The sample size needed for this study was calculated using G*Power [73]: $n = 195$ when $f^2 = 0.066$ (calculated based on the findings from existing TAM literature) [74], $\alpha = 0.05$, and Power = 90%. Considering Park and Goering's [35] reports on people's experience with health-related social media use with a potential attrition rate of up to 30% (those with no experience), the sample size of 278 was deemed appropriate for this study.

Of the 278 participants, 50% (139/278) were female and 50% (139/278) were male, and participants' age ranged from 18 to 63 years ($M = 23$, $SD = 5.11$). The majority (82%, 227/276) were undergraduates, i.e., first-year (16%, 45/276), sophomore (21%, 58/276), junior (20%, 56/276), senior (25%, 68/276), and otherwise (18%, 49/276) reported a Bachelor's degree or higher education levels. The majority (92%, 255/278) reported PHQ-9 scores that ranged from 1 (minimal) to 21 (severe) and indicated having mild levels of depression on average ($M = 5.25$, $SD = 3.58$) [70].

3.2. Motives for Depression-Related Digital Technology Use

RQ1 was to identify people's motives for depression-related digital technology use. An exploratory factor analysis—with principal component analysis and varimax rotation methods—was performed. This study considered three or more items with an eigenvalue of 1.00 or higher, primary loadings of 0.60 or higher, and secondary loadings of less than 0.40 [58], as a factor reflecting a motive for depression-related digital technology use. Four motives—three instrumental motives (communication and emotional support, information- and guidance-seeking, habitual entertainment-seeking motives) and one ritualized motive (escape motive)—were identified (see Table S3), explaining 54.03% of the total variance.

The communication and emotional support motive, the first motive, explained 25.49% of the total variance and comprised eight items (e.g., "because I want to feel listened to, understood, and cared for") describing people using specific websites or smartphone apps to talk to someone about their experiences and concerns with depression, feeling listened to, understood, and supported in depression management. The information- and guidance-seeking motive, the second motive, explained 16.09% of the total variance and comprised seven items (e.g., "to get what I need to manage depression") describing people using specific websites or smartphone apps to obtain information or guidance easily and for free, helping them learn about new, varied, or entertaining ways to understand and cope with depression. The habitual entertainment-seeking motive, the third motive, explained 8.06% of the total variance and comprised six items (e.g., "to have fun") describing people using specific websites or smartphone apps because of the convenience the technologies provide in getting entertaining content to pass time. The escape motive, the fourth motive, explained 4.40% of the total variance and comprised three items (e.g., "to get away from pressures and responsibilities") describing people using specific websites or smartphone apps as a temporary means of forgetting about things (e.g., school, work) they feel pressed or burdened with. Each motive's item scores were summed and averaged to create a communication and emotional support motive scale ($M = 2.88$, $SD = 0.87$, $\alpha = 0.87$), an information- and guidance-seeking motive scale ($M = 3.52$, $SD = 0.84$, $\alpha = 0.89$), a habitual entertainment-seeking motive scale ($M = 3.05$, $SD = 0.98$, $\alpha = 0.86$), and an escape motive scale ($M = 3.45$, $SD = 1.01$, $\alpha = 0.80$). Higher scale scores for each motive indicated stronger levels of the motive. The Cronbach's alpha for each motive scale reflected an acceptable internal consistency.

3.3. Factors Influencing Intentions to Use MyMentalPocket

Pearson product-moment correlation along with hierarchical regression analyses was conducted for H1, H2, and H4. The bivariate relationships among the variables were found using two-tailed Pearson product-moment correlations, and the relationships between parasocial interactions and intentions to use MyMentalPocket (r = 0.76, $p < 0.001$) and perceived usefulness and the intentions (r = 0.73, $p < 0.001$) emerged as the strongest correlations (see Table S4, Figures S1 and S2).

Hierarchical regression analyses were conducted to confirm factors that explain intentions to use MyMentalPocket (see Table 1). Multicollinearity tests revealed that there is no multicollinearity (tolerance values > 0.10 and variance inflation factor values < 10) [75,76] among the variables.

Table 1. Regression models explaining intentions to use MyMentalPocket.

	Intentions to Use		
Variable	**Step 1**	**Step 2**	**Step 3**
Gender	0.14 *	0.14 *	0.03
Age	−0.19 **	−0.17 **	−0.02
Depression	0.04	0.08	0.10 *
Communication and emotional support motive		0.14	0.06
Information- and guidance-seeking motive		0.15 *	−0.01
Habitual entertainment-seeking motive		0.14	−0.01
Escape motive		0.01	0.02
Perceived usefulness			0.37 ***
Perceived ease of use			0.06
Parasocial interactions			0.46 ***
R^2	0.06	0.14	0.66
ΔR^2		0.08 ***	0.52 ***

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Demographic variables entered the first step explained 6% of the variance in the intentions, with female gender (β = 0.14, $p < 0.05$) and younger age (β = –0.19, $p < 0.01$) being significant factors: R = 0.25, R^2 = 0.06, $F(3, 237)$ = 5.12, $p < 0.01$. The motives for depression-related digital technology use added on the second step explained an additional 8% of the variance in the intentions, with the information- and guidance-seeking motive (β = 0.15, $p < 0.05$) being a significant factor: R = 0.38, R^2 = 0.14, $F(7, 233)$ = 5.46, $p < 0.001$. Perceived usefulness, perceived ease of use, and parasocial interactions added on the third step explained an additional 52% of the variance in the intentions: R = 0.81, R^2 = 0.66, $F(10, 230)$ = 43.82, $p < 0.001$. At this point, participants' gender (β = 0.03, p = 0.53) and age (β = –0.02, p = 0.65) were no longer significant factors, whereas depression levels (β = 0.10, $p < 0.05$), perceived usefulness (β = 0.37, $p < 0.001$), and parasocial interactions (β = 0.46, $p < 0.001$) appeared to be significant factors influencing the intentions (see Figure 2). Therefore, H1 and H4 were supported, but H2 was not supported.

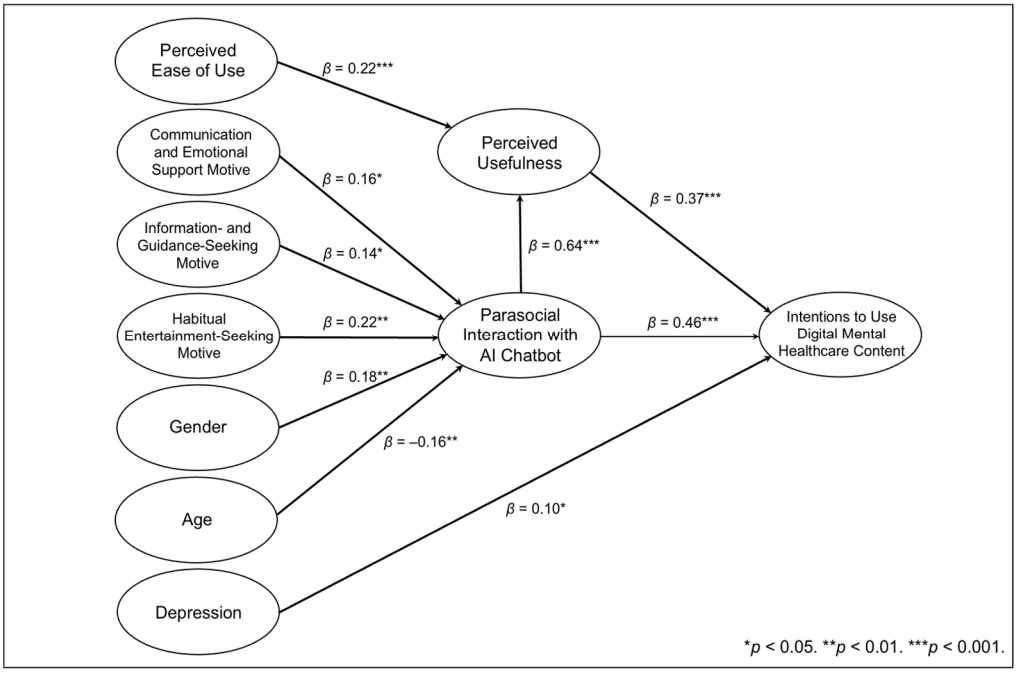

Figure 2. Results of hierarchical regression analyses.

3.4. Factors Influencing Intentions to Perceived Usefulness

Pearson product-moment correlation along with hierarchical regression analyses were conducted for H3, H5, and RQ2. The bivariate relationships among the variables were found using two-tailed Pearson product-moment correlations (see Table S4). Hierarchical regression analyses were conducted to confirm factors that explain perceived usefulness (see Table 2). Multicollinearity tests revealed that there is no multicollinearity among the variables.

Table 2. Regression models explaining perceived usefulness.

	Perceived Usefulness		
Variable	**Step 1**	**Step 2**	**Step 3**
Gender	0.09	0.08	−0.06
Age	−0.19 **	−0.18 **	−0.02
Depression	−0.06	−0.03	0.00
Communication and emotional support motive		0.05	−0.01
Information- and guidance-seeking motive		0.21 **	0.09
Habitual entertainment-seeking motive		0.11	−0.04
Escape motive		0.01	0.01
Perceived ease of use			0.22 ***
Parasocial interactions			0.64 ***
R^2	0.05	0.12	0.57
ΔR^2		0.07 **	0.45 ***

Note. ** $p < 0.01$. *** $p < 0.001$.

Demographic variables entered the first step explained 5% of the variance in perceived usefulness, with participants' age (β = –0.19, $p < 0.01$) being a significant factor: $R = 0.23$, $R^2 = 0.05$, $F(3, 238) = 4.24$, $p < 0.01$. The motives for depression-related digital technology use added on the second step explained an additional 7% of the variance in perceived usefulness, with the information- and guidance-seeking motive ($\beta = 0.21$, $p < 0.01$) being a significant factor: $R = 0.35$, $R^2 = 0.12$, $F(7, 234) = 4.52$, $p < 0.001$. Perceived ease of use and parasocial interactions added on the third step explained an additional 45% of the

variance in perceived usefulness: $R = 0.75$, $R^2 = 0.57$, $F(9, 232) = 33.55$, $p < 0.001$. At this point, the participant's age ($\beta = -0.02$, $p = 0.66$) and information- and guidance-seeking motive ($\beta = 0.09$, $p = 0.09$) were no longer significant factors, and the perceived ease of use ($\beta = 0.22$, $p < 0.001$) and parasocial interactions ($\beta = 0.64$, $p < 0.001$) appeared to be significant factors influencing perceived usefulness (see Figure 2). Therefore, H3 and H5 were supported. Regarding RQ2, when entering perceived ease of use and parasocial interactions, the motives for depression-related digital technology use did not appear to significantly influence perceived usefulness.

3.5. Factors Influencing Intentions to Parasocial Interactions

Pearson product-moment correlation along with hierarchical regression analyses were conducted for RQ3. The bivariate relationships among the variables were found using two-tailed Pearson product-moment correlations (see Table S4). Hierarchical regression analyses were conducted to confirm factors that explain parasocial interactions (see Table 3). Multicollinearity tests revealed that there is no multicollinearity among the variables.

Table 3. Regression models explaining parasocial interactions.

	Parasocial Interactions	
Variable	**Step 1**	**Step 2**
Gender	0.19 **	0.18 **
Age	−0.18 **	−0.16 **
Depression	−0.08	−0.03
Communication and emotional support motive		0.16 *
Information- and guidance-seeking motive		0.14 *
Habitual entertainment-seeking motive		0.22 **
Escape motive		−0.04
R^2	0.08	0.18
ΔR^2		0.10 ***

Note. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Demographic variables entered in the first step explained 8% of the variance in parasocial interactions, with female gender ($\beta = 0.19$, $p < 0.01$) and younger age ($\beta = -0.18$, $p < 0.01$) being significant factors: $R = 0.29$, $R^2 = 0.08$, $F(3, 239) = 7.02$, $p < 0.001$. The motives for depression-related digital technology use added on the second step explained an additional 10% of the variance in parasocial interactions, with the communication and emotional support motive ($\beta = 0.16$, $p < 0.05$), the information- and guidance-seeking motive ($\beta = 0.14$, $p < 0.05$), and the habitual entertainment-seeking motive ($\beta = 0.22$, $p < 0.01$) being significant factors: $R = 0.43$, $R^2 = 0.18$, $F(7, 235) = 7.51$, $p < 0.001$. In conclusion, regarding RQ3, the communication and emotional support motive, the information- and guidance-seeking motive, and the habitual entertainment-seeking motive, along with participants' gender and age, appeared to significantly influence parasocial interactions (see Figure 2).

Based on the results from hierarchical regression analyses, additional mediation analyses were performed to confirm if participants' intentions to use MyMentalPocket and its determinants (i.e., participants' age, gender, communication and emotional support motive, information- and guidance-seeking motive, habitual entertainment-seeking motive, and perceived ease of use) are mediated by parasocial interactions and perceived usefulness. The analyses were performed using Hayes's PROCESS macro using the bootstrapping method [77–80] and guided by Baron and Kenny's suggestions, such as checking decreased or no effects of independent variables on dependent variables when a mediator intervenes in the relationship [81]. The analyses confirmed the mediating effects of parasocial interactions and perceived usefulness for the pathways in Table 4, showing that the indirect effects are significant with no zero included in the bootstrap confidence intervals [77].

Table 4. Results of mediation analyses.

Pathways	Indirect Effect	Boot SE	Boot LLCI	Boot ULCI
PEOU → PU → IU	0.38	0.06	0.26	0.50
CES → PSI → PU → IU	0.07	0.02	0.03	0.12
IGS → PSI → PU → IU	0.07	0.02	0.02	0.12
HES → PSI → PU → IU	0.07	0.02	0.03	0.11
GEN → PSI → PU → IU	0.09	0.03	0.03	0.17
AGE → PSI → PU → IU	–0.01	0.00	–0.02	–0.01

Note. CES = Communication and Emotional Support Motive. GEN = Gender. HES = Habitual Entertainment-Seeking Motive. IGS = Information- and Guidance-Seeking Motive. IU = Intentions to Use. PEOU = Perceived Ease of Use. PSI = Parasocial Interactions. PU = Perceived Usefulness.

4. Discussion

Integrating TAM with UGT, this study examined factors that matter to people in accepting digital mental healthcare content called MyMentalPocket. The findings from this study indicate that people's intentions to use specific digital mental healthcare content could be better understood by focusing on the factors such as people's motives for depression-related digital technology use, perceived usefulness, perceived ease of use, and parasocial interactions with an AI chatbot.

People's depression levels, perceived usefulness, and parasocial interactions were positively related to intentions to use MyMentalPocket. It has been indicated that people with depression experience interpersonal difficulties [3] and might think positively about computer-based and non-face-to-face depression treatments [47]. In addition, Pitardi et al.'s [82] study argued that people might feel less embarrassed to talk with chatbots about sensitive topics, compared to human agents. Along with these reports, the findings from this study suggest that people with higher levels of depression are more likely to use digital mental healthcare content features, such as Pocky, the AI chatbot of MyMentalPocket because they think their interpersonal difficulties in help-seeking (e.g., stigma) would be mitigated.

Consistent with existing studies that have explained people's intentions to use a technology with perceived usefulness [21,83] and parasocial interactions [44], the findings from this study suggest that people who find digital mental healthcare content to be useful (perceived usefulness) and who think an AI chatbot to be their friend, advocate, and guide and the chatbot helps depression management (parasocial interactions) become willing to use the content. To reach a clearer picture of the ways that people experience perceived usefulness and parasocial interactions, this study identified people's motives for depression-related digital technology use and their roles in influencing perceived usefulness and parasocial interactions. Confirming the findings from UGT literature suggesting that there are motives for people to use a specific technology or medium [33,36,40,55,61,84,85], this study identified the communication and emotional support motive, the information- and guidance-seeking motive, the habitual entertainment-seeking motive, and the escape motive, which are the reasons behind people's digital technology use in the context of depression.

Participants' information- and guidance-seeking, communication and emotional support, and habitual entertainment-seeking motives were positively related to parasocial interactions. In turn, parasocial interactions, along with perceived ease of use, were positively related to perceived usefulness. Being mental health literate and receiving emotional support have been reported as critical to reducing depressive symptoms [39,86]. Additionally, entertaining content (e.g., photonovels, videos, games) has helped cope with mental health issues, such as increasing knowledge about depression treatment [87], improving mental health literacy [88], and promoting help-seeking behaviors [89]. In addition, entertaining content might be further helpful for people with depression in distracting themselves from the stressful reality and in mitigating depressive symptoms [15,90,91]. Taken together, the findings from this study suggest that AI chatbots such as Pocky—designed to provide convenient access to information and guidance to help people understand and manage depression, a communication channel where they make their voices heard and

receive emotional support, and entertaining content (e.g., wellness games) helping them stay away from and better cope with depressive experiences—might play important roles in motivating people to use and benefit from digital mental healthcare content.

In addition, females and younger people were likely to report higher levels of parasocial interactions than males and older people. Beyond existing reports that females and younger people report higher levels of eHealth literacy and are more actively adopting digital health technologies [92–94], it has been reported that females with depression heavily use a smartphone [95]. In addition, feeling listened to is an important part of communication for women in mental healthcare [96]. Considering these reports, the findings from this study suggest the utility of AI chatbots, such as Pocky, communicating with users in an empathetic way via smartphone, as a way to reach out to and help females and younger people understand and manage depression. On average, participants in this study agreed that MyMentalPocket is easy to use, and such perceived ease of use was found to positively affect perceived usefulness. These findings confirm the positive relationship between perceived ease of use and perceived usefulness reported by existing literature [29]. Additionally, it suggests that finding the use of digital mental healthcare content to be effortless might be important to people with depression, especially those suffering from cognitive difficulties [3,27,28] in determining whether or not they proceed to explore and confirm the usefulness of the content.

The findings from this study could inform the design of studies to improve and promote digital mental healthcare content. The findings from this study imply that improving people's parasocial interactions with an AI chatbot is expected to increase their levels of perceived usefulness and intentions to use digital mental healthcare content. Therfore, it is important that future researchers examine and reflect the following elements in updating and advancing the chatbot and improving the parasocial interactions: specific types of information and entertaining content people want the chatbot to provide or suggest (in meeting their information and entertainment-seeking needs) or specific characteristics of the chatbot they think would make them feel listened to and supported in depression management (in meeting their communication and emotional support needs), such as specific words and human-likeness that have influenced people's positive perceptions of AI chatbots and voice assistants (e.g., satisfaction, intentions to use) [48,97,98].

In addition, the findings from this study imply that improving people's perceived ease of use is also important to promote perceived usefulness and intentions to use digital mental healthcare content. Existing literature suggests that design features might influence perceived ease of use [29]. Specifically, mental health app users have shown that they prefer design features, such as the layout of an app, that are simple and self-explanatory, font sizes that are easy to read and understand, and colors that draw attention [99,100]. Considering these reports, it is suggested that future research works with people with depression in designing and updating the layout of digital mental healthcare content in ways they prefer and feel comfortable navigating and using the content. Once the content has been updated focusing on improving people's levels of parasocial interactions, perceived usefulness, and perceived ease of use, future research could assess the improvement by employing a pretest-posttest design that compares scores (e.g., mean values) on these variables before and after the updates. Once the improvement has been observed, providing people with training—from which they can learn about the utility of the content and have hands-on experience with it—could motivate them to use the content, targeting (increasing the levels of) determinants of intentions to use the content [101,102]. Such training opportunities might be especially helpful to people whose primary motive for depression-related technology use is the escape motive (e.g., those who might have used a website or a smartphone app in distracting themselves from school or work but have not paid attention to or assessed the utility or personal relevance of the content it provides) [35]. Similar to Kim's [54] study revealing a positive correlation between people's ritualized motive (passing time) and instrumental motive (entertainment), in this study, participants' ritualized motive (escape) was positively and strongly correlated with instrumental motives

(entertainment motive and communication and emotional support motive)—which in turn positively affect parasocial interactions, perceived usefulness, and intentions to use digital mental healthcare content—suggesting that people with the escape motive might also have entertainment, communication, and emotional support needs for depression management. If that is the case, they might become motivated to use digital mental healthcare content through training opportunities, directing their attention to and helping them learn about the content, such as AI chatbots, that might help meet their entertainment, communication, and emotional support needs.

There are some limitations of this study that warrant attention in future research. First, this study was conducted with a convenience sample within the context of the university, helping us understand the adoption and use of digital mental healthcare content within the university population. People's experiences with depression, however, vary across different contexts, such as occupations, organizations, and cultures [103,104], and the findings from this study should not be generalized to other contexts. For example, university students who struggle with the stress of academic performance and job application [105] and military personnel who experience stress from missions and poor morale [106] might differ in their experiences with depression and coping practices. It is recommended that future research explore how people differ in their perceptions and acceptance of mental healthcare services, such as digital mental healthcare content, in coping with depression. One suggestion is that future researchers analyze data collected at the national level, such as Health Information National Trends Survey [107,108], to understand digital healthcare content use (e.g., smartphone apps) among people with depression across demographic groups.

Second, this study utilized standardized measures and identified common motives for depression-related digital technology use across the university population. However, it remains unexplored how people within this population differ in their most important motives and the type of digital mental healthcare content they would find most useful, depending on demographic characteristics, such as status, i.e., student or faculty/staff. Meeks et al.'s [36] study on mental healthcare within the university population indicated that students and faculty/staff members differ in barriers to mental healthcare and coping practices. The study revealed that students report being concerned with the stigma and its outcomes (e.g., being treated as an incapable social outcast) as their barriers to mental healthcare and prefer coping with depression by keeping a diary or relying on entertaining content (e.g., music, movies), whereas faculty/staff report low levels of perceived severity of depression symptoms and low levels of trust in healthcare providers as their barriers and prefer self-management of the symptoms using books or apps [36]. Considering these reports, when compared to faculty/staff, communication and emotional support and habitual entertainment-seeking motives might be stronger for students, and they might find digital mental healthcare content features helping them make sense of and manage depression in a confidential manner (without feeling self-conscious or stigmatized) and with entertaining content (e.g., wellness games) to be useful. In contrast, information- and guidance-seeking motives would be stronger for faculty/staff, and they might find the content to be useful when it guides them through how to self-manage depression in their daily lives. Taken together, targeted participant recruitment and qualitative approaches are suggested for future research in understanding specific demographic group members' struggles related to depression management in depth and developing digital mental healthcare content that addresses those struggles, and, thereby, helping empower them in mental healthcare.

Third, this study was cross-sectional and thus did not keep track of people's continuous use of digital mental healthcare content nor did it explore factors that might influence their continuous use. Saad et al.'s [10] literature review revealed high dropout rates among mental healthcare technology users, and people's intentions to use a technology are not always and unconditionally related to continuous technology use [109–111]. To promote not only the initiation but the continuance of digital mental healthcare content use, there is the need for longitudinal research that assesses a relationship between intentions to use the content and continuous use, as well as factors—such as peer and coach support [112],

incentives and reminders [113], and personalized content [114]—that might moderate the relationship.

5. Conclusions

In conclusion, through the application of TAM and UGT, this study confirms the factors that might lead people to adopt the use of digital mental healthcare content. People with needs for communication and emotional support, information and guidance, and entertaining content (i.e., motives) were likely to report parasocial interactions, which lead to perceived usefulness and intentions to use the content. Females and younger people were more likely to engage in parasocial interactions, implying the important roles of AI chatbots in supporting them in depression management. The limitations of this study could be addressed by engaging in targeted recruitment and employing a longitudinal design, providing a clearer blueprint for tailoring digital mental healthcare content and designing interventions to support people in depression management through voluntary and continuous use of the content.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su15010872/s1, Table S1. Summary of literature review; Table S2. Measurement items for TAM and UGT variables; Table S3. Motives for depression-related digital technology use; Table S4. Pearson product-moment correlations among the variables; Figure S1. Bivariate relationship between parasocial interactions (PSI) and intentions to use (IU); Figure S2. Bivariate relationship between perceived usefulness (PU) and intentions to use (IU).

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