



To Chat or Not to Chat: Understanding Chatbot Use Among Chinese Undergraduates in the Context of Social Support and Mental Health

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Abstract. Artificial intelligence (AI) chatbots are increasingly used to support mental health. However, factors influencing individuals' engagement with these digital tools remain understudied. This study investigated the relationship between perceived social support, mental health status, and the intention and frequency of chatbot use among Chinese undergraduate students. A cross-sectional online survey was conducted with 398 participants, who answered questions about their demographics, mental health, perceived social support, and chatbot use. Contrary to our hypothesis, lower mental health conditions were not associated with a lower frequency of chatbot use, and participants with higher levels of perceived social support from friends were more likely to use chatbots, while those with higher levels of perceived social support from other channels were not related to the use of chatbots. Our findings suggest that AI chatbots may have unique social cues in the user's perception as a form of supplemental social connection. It may complement, rather than replace, traditional social support systems.

Keywords: Chatbots Social Support; AI Mental Health; Human-Computer Interaction.

1 Introduction

Although our understanding of mental health has expanded in recent years, it remains a dominant factor in the global burden of disease. In 2019, nearly 970 million people worldwide were living with a mental health condition, making it the 7th leading cause of DALYs (Disability-Adjusted Life Years) globally [1]. This increase has significantly overstretched the already neglected traditional psychological support systems and created a medical resources crisis. Worse still, poor mental health is expected to cost the world economy around \$6 trillion per year by 2030 due to poor health and reduced productivity [2]. Prompting an urgent need for innovative solutions.

AI chatbots have emerged as a promising tool with their potential for 24/7 availability and personalised support, and general attitudes towards the use of chatbots in mental

health intervention are positive [3] [4] [5]. Most studies consider them effective due to their long-term care ability, 24/7 availability and personalisation ability [4] [6][7]. In addition, AI chatbots' ability to respond quickly to users without the need for arrangement and physical location allows them to respond to many individuals simultaneously with a large number of patients [7], compensating for more formal traditional psychological medical resources. Furthermore, AI chatbots offer a more acceptable model of human-machine interaction for individuals who may fear discrimination or distrust traditional systems [6]. Moreover, AI chatbots have been considered able to simulate social connections and provide a sense of social support [8][9].

However, despite the advantages of AI-powered support, little is known about the factors influencing individuals' engagement with these digital tools. A crucial question remains: will individuals facing mental health challenges or lacking traditional social support actively seek help from these digital tools?

This study investigates the factors influencing Chinese undergraduates' engagement with AI chatbots for mental well-being, focusing on individuals who might benefit most: those with mental health challenges or limited social support. Through a survey, we explored the link between users' mental health status, social support, reasons for use, and their frequency of chatbot interaction. By analysing this data, we aim to understand what drives chatbot usage among this demographic, ultimately contributing to developing more effective, human-centred AI interventions.

2 Related Work

Building upon House's [10] foundational work on perceived social support, which encompasses instrumental aid, emotional caring, and information, researchers have widely acknowledged its protective effect on mental health and the diversity of its perceptual patterns [11]. Technological advancements have facilitated the emergence of diverse social support models, most notably online social support (OSS), adapting traditional conceptualisations to online environments. Nick et al. [12] define OSS as comprising four key elements: Esteem/Emotional Support, Social Companionship, Informational Support, and Instrumental Support, reflecting House's classic categorisation [10].

OSS offers distinct advantages over traditional social support, including increased accessibility across geographical boundaries [13][14], anonymity for sensitive discussions, diverse perspectives, convenient and rapid access, opportunities for considered responses [14][15], and access to valuable resources.

Despite these advantages, OSS still requires human interaction. However, the potential for chatbots to form relationships and attachment patterns with users [8][9] has opened new avenues for developing support systems that transcend human-to-human interaction and utilise natural language models.

Recent research confirms the role of chatbots in mental health intervention and screening, consistently demonstrating advantages in accessibility, anonymity, and cost-effectiveness compared to traditional support systems [3][4]. Studies indicate chatbots

are particularly beneficial for individuals facing barriers or distrust to accessing conventional mental health care [5][7][8].

Existing research on chatbot adoption focuses on user motivations, including trust, attitudes, information needs, anxiety, and socio-demographic characteristics. It suggests that individuals with higher information needs and information anxiety and males are more inclined to use chatbots [16][17][18].

However, these studies lack specific analysis of individuals in mental health crises or those experiencing social support deficits. While some research indicates that vulnerable groups with mental health crises may form closer relationships with chatbots [9], further investigation is needed to determine whether a lack of social support and mental health disorders motivate chatbot utilisation.

3 Methodology

This study investigated the relationships between perceived social support, mental health, and chatbot use among Chinese undergraduates aged 20-24. We hypothesized that higher social support and better mental health (lower depression, anxiety, and stress) would relate to less frequent chatbot use for emotional support. This cross-sectional study's design limits causal inferences.

400 students from Sichuan and Chongqing, excluding those with major mental health diagnoses or on psychoactive medication, were recruited online. 398 valid questionnaires were collected (99.5% validation rate), exceeding the minimum sample size of 385.

We hypothesised that higher levels of perceived social support and better mental health (i.e., lower levels of depression, anxiety, and stress) would be associated with a lower frequency of chatbot use for social or emotional support. It is important to note that the cross-sectional nature of this study limits our ability to draw causal inferences.

We developed questionnaires accordingly. Questionnaires include demographics and mental health using the DASS-21[19] (Cronbach's alpha = 0.904) and social support using the MSPSS [20] (Cronbach's alpha = 0.817). A self-designed questionnaire assessed chatbot use patterns, reasons for use, and attitudes toward using them for social support (Cronbach's alpha = 0.79 initially and 0.86 after pretesting).

A questionnaire was designed to assess chatbot usage patterns and perceptions of chatbots for social and mental health support. It consisted of three sections:

1. Frequency and Duration of Use: This section included questions like "How often do you use chatbots?" with categorical responses (e.g., "Less than once a week," "Every day").
2. Reasons for Use: This explored reasons for using chatbots, including the most helpful feature of chatbot emotional support, reasons for choosing chatbots over human support, and preferred platforms for social support.
3. Attitudes towards Chatbots: This assessed attitudes towards using chatbots for social support via a 5-point Likert scale (1 = "Strongly disagree" to 5 = "Strongly agree"). Example items: "I feel comfortable discussing my feelings with a chatbot," "I feel secure in discussing my emotional needs or venting with AI."

A committee that included a public health professional, a clinical medical professional, and a sociologist validated the questionnaire. A focus group of five experienced chatbot users helped refine the design. The initial Chinese version was tested with thirty online participants, and revisions were made based on their feedback. The questionnaire demonstrated reliability (Cronbach's alpha = 0.86 initially, 0.79 for the final data) and predictive validity, as confirmed by the committee and statistical tests.

The Institutional Review Board of the Institute of Southeast Asian Studies at the University of Electronic Science and Technology of China approved this study. Participants recruited online via the "Wenjuanxing" platform received a survey link through email or social media. An informed consent form outlining the study's purpose, voluntary participation, withdrawal rights, and anonymity procedures preceded the survey. Participants provided electronic consent before proceeding. Wenjuxing Group compensated participants for their time.

Data analysis was performed using SPSS version 28 [21]. Descriptive statistics summarised demographics and questionnaire responses. Chi-square tests examined relationships between perceived social support (MSPSS), mental health status (DASS-21), and chatbot use. Binary logistic regression, with a significance level of $p < .05$, identified predictors of chatbot use. Continuous variables were categorized according to the MSPSS/DASS-21 guidelines, and chatbot use was dichotomized.

A combined approach of univariate and stepwise regression was used to build the logistic regression model, given the complexity of the variables and the lack of a pre-existing framework. Initially, univariate analysis identified significant ($p < 0.05$) and marginally significant ($0.05 < p < 0.1$) variables. These were then entered into a stepwise regression, iteratively removing insignificant variables while ensuring model fit.

4 Results

This study analysed 398 participants (217 male, 181 female, average age 20). Most (59%) were in STEM, 33.9% were in Humanities/Arts/Social Sciences, and 7% in Medicine. 82.4% reported using chatbots, with ERNIE Bot (32.2%), ChatGPT (30.2%), and Kimi (12.8%) being the most popular. High-frequency users (weekly or more) comprised 61.6% of the sample.

Most participants (74.1%) used chatbots for information gathering, while only 5.8% sought emotional support. When seeking emotional support, 77.1% preferred talking to friends/family, 22.1% to therapists, 36.4% used online forums, and 26.1% journaled or used AI chatbots.

For those using chatbots for emotional support, key advantages included availability (66.3%), quick replies (64.6%), anonymity/non-judgment (45.7%), free expression (45.2%), and feeling listened to (54.5%). Participants preferred chatbots over humans for emotional support due to 24/7 availability (63.1%), non-judgmental nature (48.5%), lack of emotional impact on the chatbot (54.3%), anonymity (53.3%), and AI's consistency/rationality (46.5%).

Social Support and Mental Health:

Results show most respondents (mean 5.1-7) perceived high social support from significant others (57.8%), family (60.6%), and friends (61.1%), with few reporting low levels (mean <3, 4.0%-6.3%). This indicates a strong perceived social support network among participants.

Regarding DASS-21 scores, 54% reported moderate to extremely severe depression, while 31.4% fell within the normal range. Anxiety was most prevalent, with 68.6% reporting moderate to extremely severe symptoms and 21.6% in the normal range. For stress, 31.9% reported moderate to extremely severe levels, while a majority (52.8%) fell within the normal or mild range.

The results of the chi-square tests related to chatbot usage can be seen in Table 1. Males were more likely to use chatbots than females ($\chi^2(1, N = 398) = 4.662, p = .031$). STEM and Medicine users were more likely than Humanities, Arts, and Social Sciences users ($\chi^2(2, N = 398) = 6.309, p = .043$). Positive attitudes towards AI are associated with chatbot use ($\chi^2(2, N = 398) = 27.942, p < .001$). Higher perceived family social support is associated with increased chatbot usage ($\chi^2(2, N = 398) = 9.780, p = .008$), while higher perceived friend support is also associated with increased usage ($\chi^2(2, N = 398) = 8.965, p = .011$). Significant other support, stress, depression, and anxiety were not significantly related to usage.

Table 1. Chi-Square Results

Variable	Pearson Chi-Square	df	Sig. (2-sided)
Gender	4.662	1	0.031
Discipline	6.309	2	0.043
Monthly Allowance	1.016	2	0.602
Attitudes and Use Intention	27.942	2	0.001
Significant Other Support	0.850	2	0.654
Family Support	9.780	2	0.008
Friends Support	8.965	2	0.011
Stress	4.611	4	.330
Depress	5.053	4	.282
Anxiety	3.033	4	.552

We used binary logistic regression to understand chatbot use (yes/no), the result can be seen in Table 2. The model predicts an individual's attitude and intention toward using AI for emotional support (low, mid, high) based on several factors. These include demographics (discipline: Social Sciences, STEM, or Medical; mental health status: according to DASS-21 scale), prior social media support experience (sought support online or not, perceived support from friends: according to MSPSS scale), and preferences for AI emotional support (valuing 24/7 availability, prioritizing chatbot over a human for round-the-clock support). The participant's attitudes and intentions to use AI for social support are categorised into low, medium, or high.

4.1 Model Overview

This model uses binary logistic regression analysis to predict whether an individual uses a chatbot. The independent variables in the model were all categorical. They included the participant's discipline, the MSPSS scale friendship subcategory, attitudes and intentions toward using AI for social support, and two questions about platform usage and AI chatbot feature preferences.

4.2 Overall Model Fit & Variable Effect

The results of the Omnibus Tests of Model Coefficients of the model showed that the overall fit of the model was good ($\chi^2(8) = 53.462$, $p < .001$). The Nagelkerke R^2 value is 0.208, indicating that the model explains approximately 20.8% of the variation in the dependent variable. The Hosmer and Lemeshow test result is insignificant ($\chi^2(8) = 6.703$, $p = .569$), indicating that the model fits the data well. The model's overall predicting accuracy is around 83.4%.

The independent variables include:

Participants' Discipline was not significant in predicting overall chatbot usage (Wald (2) = 4.776, $p = 0.092$). However, the between-group effect showed that STEM students were more likely to use chatbots than social science and liberal arts students ($B = 0.592$, $\text{Exp}(B) = 1.808$, 95% CI = 1.0-3.2, $p = 0.049$). When removing this variable, the goodness-of-fit chi-square test yields a result that indicates statistical significance ($\chi^2 = 4.794$, $df. = 1$, $p = 0.0286$), so this variable was kept in the model to ensure model fit and inter-group effects.

Regarding Perceived social support from friends (categorised as Low (reference), Mid, and High Groups), the overall variable influence indicates a significant association with chatbot use (Wald (2) = 8.395, $p = .015$). However, inter-group analysis using the low group as a reference only observed a marginal significance between the Low-support group and the High-support group ($\text{Exp}(B) = 3.238$, 95% CI = 0.978-10.727, $p = .055$); this does not meet the conventional threshold for statistical significance ($p < .05$).

For Attitude and Use intention towards AI-provided social support (categorised as Low(reference), Mid, and High Groups)), the results indicate that the overall significance of its association with AI chatbot use (Wald (2) = 20.477, $p < 0.001$). The inter-group analysis indicates that compared to participants in the lower attitudes and use intention group, participants in the higher are 4.48 times more likely to use AI chatbots ($\text{Exp}(B) = 4.489$, 95% CI = 2.3-8.6, $p < 0.001$).

The tendency to use online platforms for social and emotional support represents the participants' choice of answer (online social platforms or discussion boards) to the multiple-choice question, "Which platforms do you normally use to get social support or vent your emotions?" Transformed and coded as binary variable (Yes/No). Compared to participants who did not choose this as their method of seeking emotional or social support, those who chose it are 2.03 times more likely to use AI chatbots ($\text{Exp}(B) = 2.039$, 95% CI = 1.07-3.85, $p = 0.029$).

The greater emphasis on the 24-hour availability of chatbots: Participants’ responses (7/24 availability) to the multiple-choice question “Which AI chatbot features do you think would be more helpful in providing social support?” (yes = 1, no = 0) Compared to participants who did not choose this as their desired feature, those who chose it are 2.1 times more likely to use AI chatbots ($\text{Exp(B)} = 2.195$, 95% CI = 1.241-3.882, $p = 0.007$)

A collinearity test was performed, and the highest Condition Index value for variables was 4.464, which is between attitude and the user-reported preference for chatbot features. Accordingly, this model has been confirmed without collinearity problems.

Table 2. Binary Logistic Regression Results Predicting Chatbot Usage

Variable	B	Exp(B)	95% CI for Exp(B)	Wald	df	Sig.
Intercept	- 0.957	0.384		2.117	1	0.146
Discipline (STEM vs. Social Science and Liberal Arts)	0.592	1.808	10003, 3.257	3.887	1	0.049
MSPSS Friends Score Interpretation (High vs. Low)	1.175	3.238	0.978, 10.727	3.697	1	0.055
Attitudes and Intentions Toward AI for Social Support (High vs. Low)	1.502	4.489	2.325, 8.667	20.007	1	<0.001
Use of Online Platforms for Social and Emotional Support (Yes or. No)	0.713	2.039	1.078, 3.858	4.797	1	0.029
Emphasis on 24-Hour Availability of Chatbots (Yes or. No)	0.786	2.195	1.241, 3.882	7.304	1	0.007

5 Conclusions

This study explored AI chatbot use among undergraduates. Internet use for social support predicted chatbot use, consistent with prior research. However, unlike previous findings [22], sociodemographics weren't significantly associated, potentially due to the limited, homogenous sample.

While disciplinary focus didn't directly correlate with use, a marginal difference suggested STEM students were more likely to use chatbots, possibly due to better understanding and access. This aligns with some literature but is less significant than in prior studies [6][22], potentially indicating a growing equalisation of chatbot understanding across disciplines as they become more prevalent.

Consistent with prior findings [4][23][24][25], perceived chatbot attitudes, particularly social presence and effectiveness, strongly predicted usage, highlighting mentality's role in technology adoption. This may help explain why 24/7 accessibility is also positively associated with use.

Depressive symptoms showed no significant link to chatbot use, contrary to our hypothesis and some previous research [26]. While studies suggest individuals in mental health crises might find a connection with AI [5][7][8], this doesn't seem to translate

into increased chatbot use intention. Potential explanations include users' lack of awareness of AI's supportive capabilities, discrepancies between intended and actual chatbot usage, or the unsuitability of general-purpose chatbots for mental health support. A dedicated CBT chatbot [6] might yield different results.

Higher social support, especially friendship, positively correlated with chatbot use. This might be because users with strong friendships adapt more smoothly to chatbots, potentially viewing them as similar to human friends. Strong social support could also boost enthusiasm [27] and engagement with social chatbots, aligning with research on human-AI bonding [8][9]. This may explain why mental health does not increase chatbot use. For those with low social support, chatbots could trigger social anxiety [28], potentially hindering usage for individuals with high depression or anxiety.

6 Future Suggestions

The findings of this study underscore several promising avenues for future research. Firstly, the observed disparity between users' expressed willingness to utilise chatbots for emotional support and their engagement patterns requires in-depth investigation. Future studies should prioritise identifying factors contributing to this discrepancy, including potential barriers to adoption and design limitations that may hinder chatbot effectiveness. Concurrently, a comparative analysis of chatbot characteristics versus those of human friends in traditional social contexts is warranted. Such an analysis could elucidate users' perceptions of chatbots, informing the development of more effective human-computer interaction features and ultimately promoting adoption.

Furthermore, examining the similarities and differences between social and friendship support models delivered by artificial intelligence (AI) could provide crucial insights into machines' evolving role and perceived status in human-machine interactions. This line of inquiry can enhance our understanding of how AI cultivates attachment and social connection within social environments and contribute to developing a theoretical framework for human-machine social connection.

In addition to these quantitative investigations, a parallel qualitative study is strongly recommended to complement the current findings. Specifically, qualitative research can shed light on the reasons underlying the observed inconsistency between user intentions and actual usage frequency, potentially revealing barriers that prevent chatbots from effectively providing emotional support. This qualitative exploration is particularly crucial given that our hypotheses regarding chatbot use were not supported. For instance, understanding why mental health appears unrelated to chatbot usage frequency, despite previous findings suggesting its efficacy in alleviating mental health concerns, necessitates a qualitative approach. Similarly, the significant impact of friendship support on chatbot usage, without a corresponding effect from other aspects of social support, warrants further qualitative investigation. Such research can potentially uncover the unique social dynamics of chatbots and their interplay with existing social patterns.

Ultimately, the knowledge gained from these suggested research directions will offer valuable insights into machines' evolving role and perceived status in human-machine

interactions, contributing to developing a robust theoretical framework for understanding and optimising human-machine social connections.

7 Limitation

This study has several limitations that warrant consideration. Firstly, the cross-sectional nature of the survey design allows us to identify associations between variables but precludes definitive conclusions regarding causality. Future research employing longitudinal or experimental designs is necessary to more thoroughly examine the causal relationships between social support, mental health, and chatbot use.

Secondly, the sample population was drawn from a specific demographic, namely undergraduate students from two provinces in China (Sichuan and Chongqing), and individuals with significant mental health diagnoses were excluded. While this approach was implemented to control confounding variables in this exploratory phase, it potentially limits the generalizability of our findings. Geographical, social, and cultural factors may influence chatbot usage patterns, and therefore, caution should be exercised when extending these results to the broader population.

Finally, using binary logistic regression, while appropriate for identifying significant predictors, may not fully capture the complexity of the relationships between variables. Potential mediating or confounding effects might have been overlooked. For example, the instability of the model's goodness of fit after removing the insignificant variable of 'discipline' suggests that the influence of discipline is more intricate than can be elucidated by binary logistic regression alone. This method may have oversimplified our interpretation by neglecting the mediating and combined effects of the variables, thus obscuring the nuanced interplay of factors influencing chatbot use and failing to fully capture the specific effect associations of the variables in the model.

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