

The Impact of Mental Health Apps on Well-Being: An Empirical Study

Wenqi Shan¹,
Yiting Sun^{2,*} and
Sijia Wu³

¹ Faculty of History, Nankai University, Tianjin, 300350, China

² Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, SE5 8AF, United Kingdom

³ Department of Psychology, Durham University, Durham, DH1 3LG, United Kingdom

*Corresponding author:
K2368528@kcl.ac.uk

Abstract:

In recent years, anonymous text-based platforms and emotional support apps such as VEOR have provided Chinese young adults with spaces to express emotions and seek psychological comfort. Despite their popularity, there is limited research examining how these anonymous interactions impact users' mental health. This study explored how anonymous emotional support on the apps affected the well-being of Chinese young adult. 88 participants were recruited to complete the questionnaire. Eight participants were interviewed online as part of a qualitative analysis. The quantitative analysis results indicated that neither the use of the VEOR app nor similar emotional support features produced statistically significant differences in general well-being; however, the frequency of VEOR usage may have an influence on certain dimensions of General Well-Being (GWB) Schedule. The qualitative analysis results showed that VEOR users and two users of other apps felt supported and resonated. Users gained a sense of value from altruism, reporting great satisfaction when they were able to help others by listening and engaging in conversation. Users appreciated the diverse perspectives that these text-based support platforms offered. AI-provided answers offered a form of emotional validation, but they were not seen as significantly contributing to overall well-being. While no statistically significant differences were observed, the results revealed a potential trend: users who frequently used anonymous text-based support apps reported higher levels of well-being. The outcomes provide empirical evidence for the effectiveness of applying emotional support and promote the development of future mental health applications with specific directions.

Keywords: Chinese young adult; online; emotional support; well-being; mental health.

1. Introduction

In recent years, anonymous text-based platforms, such as “tree hole” forum (an online confessional board), “drifting Bottle” features (an online function where users can anonymously send and receive short messages, like a message-in-a-bottle), and emotional support apps like VEOR, have provided Chinese young adult with spaces to express emotions and seek psychological comfort. Among Chinese young adults, particularly university students, and the psychological health issues are relatively severe [1]. Meta-analyses report rates ranging from 28% to 35%, with some studies reflecting a post-COVID-19 increase to nearly 39%, suggesting the prevalence of depressive symptoms is high [2,3]. Moreover, research shows that students experiencing depression tend to have lower average academic achievement, especially in certain fields of study [4]. The mental health of young adult is an important and pressing issue. Evidence also suggests that text-based emotional support interventions can be effective. A rapid review of phone-based synchronous text therapy for youth found that all seven included trials reported improvements in depression and anxiety, alongside high usability ratings [5]. A meta-analysis targeting a wide range of participants has demonstrated the feasibility of mental health-related applications such as mindfulness training programs. Participants generally believe that these applications are useful tools for improving happiness levels, but a significant empirical gap remains regarding the application of anonymous emotional communication [6]. However, there is limited research examining how these anonymous interactions impact users’ mental health. In this study, anonymous digital interaction refers to the exchange of information that users participate in without disclosing their personal identifiers. The emotional expression through the process is the disclosure of personal feelings and psychological experiences in this anonymous background. The perceived support in this study reflects users’ subjective evaluation of the adequacy and usefulness of emotional support obtained through anonymous interaction. According to the World Health Organization, mental health is a state of well-being that enables individuals to cope with life stresses, realize their abilities, learn and work well, and contribute to their community [7]. The assessment of mental health in this study is achieved by measuring self-reported subjective well-being (such as life satisfaction and positive affect).

This research is grounded in Social Support Theory (SST), which proposes two mechanisms: the direct effects hypothesis, which posits that social support universally enhances psychological well-being, and the buffering hypothesis, which suggests that support serves to miti-

gate the negative effects of stress [8]. Additionally, this study also draws on Computer-Mediated Communication (CMC) theories, particularly Social Information Processing (SIP) Theory, suggesting that meaningful relationships can develop online despite anonymity and limited cues. These theories are integrated together to form a complete conceptual model: SST provides a framework for understanding how anonymous interaction affects well-being (by directly enhancing happiness and stress buffering), while SIP theory explains why this emotional support can occur in environments with limited online cues - that is, users develop deep relationships by reinforcing language cues. Participants’ emotional expression, perceived support, and well-being will be systematically assessed through surveys. This model provides a basis for examining how users’ emotional expression, perceived support, and subjective well-being interact within anonymous digital contexts.

The research used well-being as a dependent variable to explore how anonymous emotional support on the apps affected the well-being of Chinese young adult. According to a meta-review of prior research, mental health apps targeting anxiety and depression show certain clinical advantages; they tend to be more effective when applied as guided intervention or adjuvant therapy [9]. However, previous suggestions and ideas for developing mental health apps in the literature have primarily focused on the theoretical stage and have not been fully translated into practice. The outcome of this study can fill the gap in empirical evidence in this field. Most mental health apps available on the market at present are still in the experimental stage and have yet to mature into widely adopted tools. This research aimed to provide insight into how mental health apps can be improved by examining the impact of these apps on the depressive mood levels of the user population through an investigation of changes in the happiness index before and after using the app.

2. Methodology

2.1 Quantitative Analysis

Participants were recruited from two groups: (1) individuals aged between 18-30 who had previously used the anonymous emotional support app VEOR or similar platforms; and (2) a control group consisting of individuals over 18 who had never used VEOR or comparable emotional support applications. VEOR is a mental health-focused app that provides individualized emotional support and companionship through one-on-one human-written communication. 88 participants were recruited in the app user discussion groups.

The questionnaire included participants' demographic information (such as age and gender), the frequency of using VEOR and emotional support features, as well as General Well—Being (GWB) Schedule [10]. The simplified Chinese version of the schedule revised by Duan Jianhua contains six dimensions, which measured satisfying interesting life (item 6, 11, maximum score=11), health worry (item 10, 15, maximum score=16), energy level (item 1, 9, 14, 17, maximum score=28), depressed-cheerful mood (item 4, 12, 18 maximum score=22), emotional-behavioral control (item 3, 7, 13, maximum score=17), and relaxed versus tense-anxious (item 2, 5, 8, 16, maximum score=26) [10, 11]. The 0-14 items adopted 5-point (1-5) or 6-point (1-6) Likert scale, while the 15-18 items adopted 11-point Likert scale (0-11) [11]. The final score was calculated by summing the scores of all the individual items [11]. The higher overall scores on 18 items indicated the higher well-being (score range: 0-120). In particular, items 1, 3, 6, 7, 9, 11, 13, 15, and 16 was needed reverse scoring [12]. According to the Rating scales for mental health, the correlation coefficients between the scores of individual items and the total score ranged from 0.48 to 0.78, which those between the subscales and the whole scale ranged from 0.56 to 0.88 [12]. The Cronbach's α coefficient was 0.850, demonstrating satisfactory reliability [12].

The questionnaire was created and stored in Google Forms and the questionnaire star. Excel and SPSS 27 software were used for data processing and analysis. Statistical methods contained descriptive statistics, t-tests and One-way ANOVAs.

2.2 Qualitative Analysis: In-depth Interview

The interviewees included four users who had used VEOR and four users who had used other text-based support apps or related functions. One of them was interviewed in text, and the other seven were interviewed by online call.

This study asked users 7 questions to understand their journey:

1. What was your emotional state the first time you used the app?
2. Which features did you use the most?
3. What was your most memorable moment while using the app?
4. How did your feelings change after using it? Did you feel understood or comforted? Did this kind of anonymous support improve your sense of well-being?
5. Were there any moments that made you feel uncomfortable or that the support was ineffective? Why?
6. Out of the six dimensions of well-being, which do you think was helped the most for you?
7. What are your suggestions or expectations for anonymous online support apps?

3. Results

3.1 Quantitative Results

3.1.1 Descriptive analysis

A total of 88 valid questionnaires had been collected. The remaining detailed data are listed in Table 1. In terms of gender distribution, female participants accounted for the majority (83%). From the perspective of age, participants aged 18 to 25 accounted for 70.5%. Young women constituted the majority of the sample as a whole. The statistical showed that the vast majority of participants (78.4%) had never used VEOR. "Rarely used" was selected by a significant proportion of those who have used it (10.2%). Most participants (67%) had not used VEOR or similar apps' features (e.g., drifting bottle, which allows users to send anonymous messages randomly to strangers, as well as one-on-one text support) to seek anonymous emotional support.

Table 1. Participants demographic characteristics

		Frequency	Percent	Cumulative Percent
Gender	Male	14	15.9	15.9
	Female	73	83	98.9
	Non-binary/Transgender/Other	1	1.1	100
Age	18-25 years old	62	70.5	70.5
	25-30 years old	26	29.5	100
Frequency of using VEOR	Never used	69	78.4	78.4
	Rarely used (1-2 times per half year)	9	10.2	88.6
	Occasionally used (1-2 times per month)	5	5.7	94.3

	Sometimes used (1-2 times per week)	2	2.3	96.6
	Frequently used (3+ times per week)	2	2.3	98.9
	Used almost daily	1	1.1	100
Number of times of using the corresponding functions	None	59	67	67
	1-5 times	21	23.9	90.9
	6-10 times	4	4.5	95.5
	Over 10 times	4	4.5	100

GWB scale scores and six subscales score statistics were displayed in Table 2. The higher total score indicated the higher level of participants' well-being. The total GWB scores of participants ranged from 47 to 118, suggesting significant individual variability. The average score was a moderate to high level (75.864), indicating the upper-moderate level of participants' general well-being. Based on the performance across the subscales, the sam-

ples showed overall moderated high levels (see Table 2). With a score of 75% of the maximum, the "emotion-behavior control" dimension got the highest score, demonstrating participants had strong emotional regulation skills. Conversely, the "health worry" dimension received the lowest average scores (46.6% of the maximum), suggesting a certain level of anxiety about health-related issues in this group.

Table 2. Distribution of responses on the GWB scale and subscales

	MIN	MAX	M	SD
GWB total (0 - 120)	47	118	75.864	13.633
satisfying interesting life (0 - 11)	3	11	6.796	1.913
health worry (0 - 16)	1	16	7.455	2.836
energy level (0 - 28)	8	28	17.193	4.275
depressed - cheerful mood (0 - 22)	7	22	15.307	3.200
emotional - behavioral control (0 - 17)	8	17	12.750	2.183
relaxed versus tense – anxious (0 - 26)	3	26	16.364	4.421

3. 1. 2 Independent samples T-test

Two independent samples T-tests were conducted to examine whether usage of the VEOR app and similar emotional support features had influence on general well-being (see Table 3 and Table 4). The independent variables were (1)

VEOR app usage (yes or no) and (2) emotional support features usage (yes or no). The dependent variables were the total and subscale scores of GWB. Table 3 and Table 4 displayed the results. The two independent variables neither produced statistically significant differences ($P > 0.05$) on the total and subscale scores of GWB.

Table 3. Independent samples t-test (VEOR app usage)

	Whether to use VEOR	N	M	SD	t	P
GWB Total	no	69	75.783	14.120	-0.016	0.916
	yes	19	76.158	12.043		
satisfying interesting life	no	69	6.739	2.005	-0.524	0.601
	yes	19	7.000	1.563		
health worry	no	69	7.493	2.883	0.240	0.811
	yes	19	7.316	2.730		
energy level	no	69	17.015	4.520	-0.745	0.458
	yes	19	17.842	3.253		

depressed - cheerful mood	no	69	15.377	3.116	0.389	0.698
	yes	19	15.053	3.566		
emotional - behavioral control	no	69	12.739	2.324	-0.018	0.914
	yes	19	12.790	1.619		
relaxed versus tense - anxious	no	69	14.420	4.667	0.228	0.820
	yes	19	16.158	3.484		

Table 4. Independent samples t-test (emotional support features usage)

	Whether to use similar apps' features	N	M	SD	t	P
GWB Total	no	59	76.949	14.137	1.066	0.289
	yes	29	73.655	12.491		
satisfying interesting life	no	59	6.949	1.969	1.076	0.285
	yes	29	6.483	1.785		
health worry	no	59	7.441	2.878	-0.065	0.948
	yes	29	7.483	2.798		
energy level	no	59	17.170	4.484	-0.074	0.941
	yes	29	17.241	3.888		
depressed - cheerful mood	no	59	15.678	3.003	1.565	0.121
	yes	29	14.552	3.501		
emotional - behavioral control	no	59	12.831	2.237	0.491	0.624
	yes	29	12.586	2.096		
relaxed versus tense - anxious	no	59	16.881	4.731	1.580	0.118
	yes	29	15.310	3.557		

3.1.3 One-way ANOVA

Two one-way ANOVAs were conducted to investigate whether the frequency of using VEOR and the frequency of using emotional support features affected general well-being (see Table 5 and Table 6). The independent variables were (1) frequency of using VEOR and (2) frequency of using emotional support features. The dependent variables were the total and subscale scores of

GWB. The results on Table 5 and Table 6 displayed no significant differences ($P > 0.05$). Notably, the frequency of using VEOR showed certain trends (P values are 0.066 and 0.081, above but close to 0.05) with "energy level" dimension ($F = 2.82$, $p = 0.066$) and "emotional-behavioral control" dimension ($F = 2.61$, $p = 0.081$) in Table 5, indicating that the frequency of VEOR usage might have influence on some dimensions of general well-being.

Table 5. One-way ANOVA (frequency of using VEOR)

	SSB	SSW	F	p
GWB total	928.837	1681.689	1.933	0.161
satisfying interesting life	13.278	30.722	1.513	0.252
health worry	44.405	89.700	1.733	0.199
energy level	85.004	105.522	2.819	0.066
depressed-cheerful mood	56.858	172.089	1.156	0.371
emotional-behavioral control	20.136	27.022	2.608	0.081
relaxed versus tense-anxious	17.271	201.256	0.300	0.873

Table 6. One-way ANOVA (frequency of using emotional support features)				
	SSB	SSW	F	p
GWB total	228. 980	4139. 571	0. 719	0. 497
satisfying interesting life	3. 075	86. 167	0. 464	0. 634
health worry	16. 539	202. 702	1. 061	0. 361
energy level	41. 751	381. 560	1. 422	0. 259
depressed - cheerful mood	14. 220	328. 952	0. 562	0. 577
emotional - behavioral control	3. 618	119. 417	0. 394	0. 678
relaxed versus tense - anxious	12. 219	341. 988	0. 464	0. 634

3.2 Qualitative Results

The interviews aim to explore users' experiences with text-based emotional support apps. This study asked users 7 questions to understand their journey. After conducting online interviews with 8 users (4 who used VEOR and 4 who used other text-based emotional support apps), four main themes are extracted: a sense of support and resonance, the value gained from altruism, and diverse perspectives and expectations for the matching mechanism.

3.2.1 Sense of support and resonance

Most interviewees used these apps out of a feeling of loneliness, while a few were simply curious. Among them, four VEOR users and two users of other apps felt supported, believing that no matter what happened, someone would be there to listen. The presence of people with similar experiences also helped to alleviate their loneliness.

User W: "When I saw that a group of people were willing to spend time supporting me through my problems, I felt very encouraged. When I encountered people who could really help me deal with my situation better, I was very happy."

User Y: "When you have some confusion or troubles, talking to people around you might only help to a limited extent. So I felt happy to have a platform like this. It's quite typical to find people in the same situation as you, and you realize you aren't alone. You gain more perspectives and feel like, 'Oh, I have people like me. We can stick together and find warmth.' I get that kind of feeling." Both users stressed the value of support. User W felt encouraged when others spent time helping. User Y found comfort in meeting people with similar experiences. The cases show that shared empathy and belonging were central to their positive experiences.

3.2.2 Value gained from altruism

All four interviewees who used VEOR mentioned that they derived a deep sense of fulfillment from helping others improve their well-being, particularly through listen-

ing and providing support. This phenomenon of "helping others to help oneself" indicates that the platform is not only a place to receive support, but also a space where users can improve their own well-being through prosocial behavior.

User W: "Actually, when I help others, I also get a great sense of satisfaction. I feel that what I am doing is meaningful."

User Z: "Being able to provide support to others, I think that also comes back to me. I feel like it's a very valuable thing to do."

Both users described a sense of meaning from helping others. User W felt satisfied and meaningful, while User Z viewed support as valuable and rewarding. The cases show that altruism enhanced their own well-being.

3.2.3 Diverse perspective

Half of the users mentioned that real human text-based support can provide diverse perspectives, helping them view their problems from different angles.

User A: "One time I was under a lot of pressure with my graduation thesis, and I sent out a message in a 'drift bottle.' Different people comforted me from different perspectives. Even though their messages were all different, I still felt comforted."

User Z: "It seems that communicating with real people allows you to see more different perspectives."

Both emphasized that exposure to different viewpoints was a key source of comfort and insight.

3.2.4 Matching mechanism

Several users expressed a desire to be matched with listeners or confidants who are more skilled or familiar with specific topics. This would help them establish connections more quickly.

User Z: "I hope I can quickly and directly match with someone based on my past experiences or tags I give myself, for example, if I need a female companion. I think it would be better if they had different sections to make more precise matches."

User W: “I actually hope that it can improve the accuracy of the matching to some extent. Although, just like in professional counseling, you’re bound to encounter many people who aren’t a good fit. It’s a process of trial and error, which is also helpful to us. I hope that in the future, these types of apps can someday use algorithms or other technology to improve and help us reduce the trial-and-error process when matching. This is what we hope this era can achieve.”

Both users expressed a need for better matching. User Z hoped for faster, more precise connections based on personal tags or preferences. User W also wanted improved accuracy but acknowledged that trial and error can be part of the process. The cases show a strong desire for technological solutions to enhance matching efficiency.

3.2.5 Summary of qualitative findings

The interviews revealed three key themes. First, a sense of support and resonance was a major finding. Most users, driven by loneliness, felt comforted by a listening community and relieved to find others with similar experiences. Second, users gained a sense of value from altruism, reporting great satisfaction when they were able to help others by listening and talking. Lastly, users appreciated the diverse perspectives that these text-based support platforms offered. Furthermore, there is a distinction emerged regarding AI-based apps. Some users note that AI-provided answers felt too standardized. While these answers offered a form of emotional validation, they were not seen as contributing significantly to overall well-being. They also mentioned the effectiveness of support is highly dependent on the supporter’s conversational skill and their ability to genuinely empathize with the user’s struggles. All users also expressed a strong desire for a more effective matching mechanism to reduce the time spent searching for a suitable conversation partner and to establish connections more quickly.

4. Discussion

This study aimed to explore whether the use of VEOR and anonymous emotional support functions affected users’ psychological general well-being. The results of the T-tests and two one-way ANOVAs suggested no statistically significant differences. One possible explanation is that the people who need to use VEOR and anonymous emotional support functions are inherently at a low level of well-being, and the usage of functions improved their level. While those with an inherent higher well-being level may have on motivation to seek or use these tools. Another explanation is that the small sample size and unbalanced sample distribution between experimental and control

groups affect the stability of data analysis. As the results reflected, the frequency of using VEOR showed certain trends with two dimensions. This may imply a potential benefit of VEOR to improve users’ level of well-being. It is necessary to verify the trends combination with qualitative analysis.

The interviews identified three themes: emotional support, altruistic value, and diverse perspectives. AI responses were perceived as standardized and limited in impact on well-being. Effective support relied on human empathy and communication skills. Participants emphasized the need for improved matching systems to facilitate quicker connections.

There were several limitations in this study. Firstly, the small sample size limited the statistical power, making it difficult to detect subtle but potentially meaningful effects. A larger sample and more balanced distributions may lead to more significant difference. Secondly, the study did not control other potential influencing variables, such as participants’ mental health history and emergencies in their lives. Thirdly, self-reported data might lead to recall biases and social desirability biases, which may lead participants to provide inaccurate and socially desirable responses rather than according to their actual conditions. Lastly, users who were willing to be interviewed were more likely to be beneficiaries of these apps. Thus, while there was no statistically significant difference, most interviewees reported that the apps were effective.

Future research can further validate the identified potential trends through expanded sample sizes and extended study durations, thereby addressing the limitations of this study. Localized adaptations in areas such as family trauma prevalent in East Asia could be considered for implementation in school administration systems in countries with high suicide rates among adolescents. For future development of emotional support app, it is recommended to refine user group classifications and personalized needs, such as distinguishing between diagnosed populations and users only experiencing emotional distress, or implementing personality assessment tools, such as Big Five Personality model.

5. Conclusion

This study examined the impact of emotional support app usage on the well-being of young people through intergroup comparisons. While no statistically significant differences were observed, the results revealed a potential trend: users who used mental health apps more frequently reported higher levels of well-being. The outcomes provide empirical evidence for the effectiveness of the application of emotional support and promote the development of future

mental health applications with specific suggestions and directions.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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