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Perceived Digital Counselling Services and Mental Health among Chinese University Students: A Cross-Sectional Study

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ABSTRACT

Objective: This study examined gender and academic-year differences in perceived digital counselling services and mental health symptoms among Chinese university students and investigated their association.

Methods and Materials: A cross-sectional online survey was conducted in November 2025 among 1,565 undergraduates from 12 Chinese public universities. Participants were recruited through convenience sampling and had previously accessed digital counselling services. Data were collected using a 14-item digital counselling services questionnaire and a modified, reverse-scored DASS-21-based symptom measure. Independent-samples t tests, one-way ANOVA, Pearson correlation, and multiple linear regression were performed.

Findings: Female students reported higher digital counselling service scores (4.166 vs. 4.027; t= 6.766, p< .001, d= .341) and fewer mental health symptoms (4.395 vs. 4.318; t= 4.992, p< .001, d= .252) than males. Academic-year differences were significant for service perceptions (F= 11.146, p < .001, η^2 = .021) and mental health symptoms (F= 37.294, p< .001, η^2= .067). Service perceptions correlated positively with reverse-scored mental health scores (r= .450, p< .001). This association remained significant after adjustment for gender and academic year (β= .455, p< .001), with the regression model explaining 32.5% of the variance (R^2= .325).

Conclusion: More favorable perceptions of digital counselling services were associated with fewer self-reported mental health symptoms. Causal or therapeutic effects cannot be inferred.

Keywords: Digital Counselling, Mental Health, University Students, Psychological Symptoms, Cross-Sectional Study, China.

Introduction

The rapid development of digital technologies is transforming access to mental health information and support (Wang et al., 2022). Digital platforms can extend services beyond face-to-face settings and improve access to psychological support (D'Adamo et al., 2023). University students experience substantial mental health needs, including anxiety, depression and distress associated with academic and social pressures (Chen et al., 2024; Fan et al., 2025). Research in China also highlights the importance of accessible mental health support in higher education (Wu et al., 2025).

Digital mental health resources include online therapy programs, mental health applications and online self-help tools (Wang et al., 2022). Digital counselling services can deliver psychological interventions, emotional support and mental health education through mobile applications and video consultations, alongside emerging AI-assisted tools (Anteneh et al., 2025; Torous et al., 2025). These resources offer flexibility and accessibility, although implementation should remain attentive to therapeutic relationships, cultural context and human connection (Seyed Alitabar, 2026).

From the perspective of the Unified Theory of Acceptance and Use of Technology (UTAUT), an individual's use of digital technologies is influenced by factors such as performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC) (Venkatesh et al., 2003). Although UTAUT has been widely used to explain the adoption of digital technologies, research on the use of digital counselling services among university students remains relatively limited. Therefore, examining the engagement of university students in digital counselling services from the perspective of technology adoption would help better understand the role of digital platforms in the mental health management of university students.

Within Chinese higher education, academic demands and social pressures contribute to the need for accessible psychological support (Fan et al., 2025; Feng et al., 2025). Digital infrastructure offers opportunities for universities to expand support, although the adoption and implementation of digital interventions require attention to local needs and context (Sit et al., 2024).

Previous research has explored digital mental health interventions and online counselling in higher education settings, revealing that digital platforms may provide students with more accessible avenues for psychological support and can serve as an important complement to traditional counselling services (Alojail, 2024; D'Adamo et al., 2023). However, existing research has primarily focused on evaluating the effectiveness of specific digital interventions or examining students' attitudes towards digital mental health technologies (Wang et al., 2022). In contrast, there has been limited research on how university students utilize digital counselling services in real-world university settings and the relationship between this usage and their mental health status.

Sociodemographic characteristics may influence help-seeking and mental health. Female students are often more willing than male students to seek psychological support (Ning et al., 2022; Qiu et al., 2024). Academic year may also influence students' information needs and familiarity with available resources (Li et al., 2023). Examining gender and academic-year differences can therefore help characterize students' perceptions of digital counselling services.

Using UTAUT as a conceptual framework, this study examines gender and academic-year differences in digital counselling service scores and mental health among Chinese university students. It also examines the association between these scores. The service measure assesses students' perceptions and experiences rather than objectively recorded service-use frequency.

Literature Review

Unified Theory of Acceptance and Use of Technology

Digital counselling services can be understood through the UTAUT, which explains individual adoption and use of technologies through PE, EE, SI, and FC (Su et al., 2025). In the context of digital counselling services, PE refers to students' perception of the effectiveness of digital

counselling services in improving mental health or alleviating stress; EE represents students' perception of the ease or difficulty of using digital counselling services; SI denotes the influence of peers, family members, or professionals, which can encourage students to engage with digital counselling services; and FC reflects the availability of technical resources and institutional support, enabling students to effectively utilize these services (Su et al., 2025). Research has shown that PE, EE, and SI are among the most stable predictor factors influencing university students' engagement in digital counselling services (Anteneh et al., 2025).

In addition to the core constructs of UTAUT, privacy is widely recognized as a significant factor influencing the adoption of digital counselling services (Gu et al., 2021). Given that psychological counselling involves highly sensitive personal information, concerns about data confidentiality and information security may influence students' willingness to use digital counselling services (Zhang et al., 2025). Engaging in digital counselling services can provide students with psychological guidance, coping strategies, and emotional support, thereby helping them manage mental symptoms such as depression, anxiety, and stress (Anteneh et al., 2025). Therefore, this study explores the situation of university students' engagement in digital counselling services and its relationship with their mental health status, based on the UTAUT framework.

Digital Counselling Services

Digital counselling services are becoming part of university mental health support systems. Mobile applications, video consultations and emerging AI-assisted tools can provide accessible resources for psychological support (Torous et al., 2025). Reviews of digital cognitive-behavioral and mindfulness interventions describe their potential role in student mental health support while emphasizing the need to distinguish intervention availability from uptake and clinical benefit (D'Adamo et al., 2023; Yosep et al., 2024).

Chinese university students' mental health needs reflect academic pressures, social circumstances and patterns of digital engagement (Fan et al., 2025; Feng et al., 2025). Online consultations and other digital support tools may provide flexible routes to help. Service design should also account for the cultural meanings of distress and help-seeking, rather than assuming that the same approach will suit every setting (Seyed Alitabar, 2025; Sit et al., 2024).

The current study defines digital counselling services as technology-mediated platforms that address Chinese university students' psychological needs by providing interventions, emotional support, and mental health education via mobile apps, video conferencing, and AI-based tools.

Mental Health

Chinese university students experience interrelated symptoms of depression, anxiety and stress (Fan et al., 2025). Digital engagement may introduce additional challenges: social media addiction has been associated with mental health symptoms and academic burnout in college students (Feng et al., 2025). Related research among adolescents also identifies associations between patterns of short-video and social-media use and psychological health (Liu et al., 2024).

The current study explores mental health status of Chinese university students, including depression, anxiety, and stress.

Hypotheses

Research has shown that there are significant gender differences in the use of digital counselling services and mental health status among university students. Compared to male students, female students generally hold a more positive attitude towards digital counselling services and exhibit higher levels of online mental support utilization (Ning et al., 2022). In contrast, male students are often less likely to seek psychological help proactively due to stigma and a stronger inclination towards self-reliance (Qiu et al., 2024). Furthermore, studies have found that Chinese university students exhibit significant gender differences in terms of mental health issues, with female students typically reporting higher levels of depression, anxiety, and stress

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symptoms (Fan et al., 2025). These findings suggest that gender may play a crucial role in both the behavior of seeking help in digital counselling services and the outcomes related to mental health. Accordingly, the study proposes the following hypotheses.

H1: There are significant gender differences in digital counselling services among Chinese university students.

H2: There are significant gender differences in mental health among Chinese university students.

Students at different stages of university education may differ in their mental health information needs and use of online resources (Li et al., 2023). However, the direction and extent of academic-year differences should be examined empirically rather than assumed. Accordingly, the following hypotheses were proposed.

H3: There are significant year-of-study differences in digital counselling services among Chinese university students.

H4: There are significant year-of-study differences in mental health among Chinese university students.

With the advancement of digital technology, the application of digital tools in mental health services has become increasingly widespread (Torous et al., 2025). In the student population, digital counselling services are recognized as an important means of increasing access to psychological support and addressing the growing mental health needs (Anteneh et al., 2025), given the increasingly prominent mental health challenges faced by Chinese students (Chen et al., 2024). It is possible that students' engagement with digital mental health services is related to their mental health status. Hence, the study proposes the following hypothesis.

H5: There is a significant association between digital counselling services and mental health among Chinese university students.

Methods and Materials

This study surveyed students from 12 public universities in China through an online questionnaire, and data were collected using a convenience sampling method. The questionnaire was distributed through university mental health centers and counselling instructors, and participation was entirely voluntary. The data collection took place during the regular semester in November 2025, when students were actively engaged in coursework and campus activities, and ethical approval was obtained (ethics number: DPUHREC007/68FB). Before beginning the questionnaire, participants were required to read an online informed consent statement. Only respondents who agreed to participate in the study could proceed with completing the questionnaire.

Participants

The participants were Chinese undergraduates aged 18 years or older who had accessed digital counselling services at least once. The final sample comprised 1,565 students: 800 females (51.12%) and 765 males (48.88%). There were 363 first-year students (23.19%), 442 second-year students (28.24%), 368 third-year students (23.51%) and 392 fourth-year students (25.05%).

Measures

1.1.1. Digital Counselling Services Scale

The digital counselling service scale was developed based on the UTAUT from the relevant research in the field of digital counselling on mental health (Anteneh et al., 2025; Gu et al., 2021), including four dimensions: PE, EE, SI, and Privacy. To ensure the content validity of the scale, eight experts in the fields of digital mental health and educational psychology were invited to review the relevance and clarity of the items. Based on their feedback, some of the items were modified and two items were added, resulting in a final scale of 14 items.

Sample items include: "My university provided encouragement and information that made me more willing to use digital counselling services," and "The digital counselling services platform was easy to use." All items are measured using a 5-point Likert scale, with scores ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate a more positive perception of engagement with and experience of digital counselling services. The

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construct validity of the scale was tested through confirmatory factor analysis (CFA).

1.1.2. Mental Health Measure

Mental health was assessed using a study-specific modification of the 21-item Depression Anxiety Stress Scales (DASS-21), covering depression, anxiety and stress. The Chinese DASS-21 has previously demonstrated reliability and validity (Wang et al., 2016). In the present study, responses were recorded on a five-point scale from 1 (does not apply) to 5 (always applies), and all items were reverse-scored so that higher scores represented fewer symptoms. This response format differs from the standard DASS-21; the resulting scores should therefore be interpreted as a modified symptom index rather than using standard DASS severity thresholds.

Findings

Reliability and Validity

In the present study, the digital counselling services scale showed good internal consistency, with a Cronbach's alpha of .808. The standardized factor loadings (.613-.865), composite reliability (CR) (.766-.862), and the average variance extracted (AVE) (.522-.560) indicate adequate convergent validity. The square roots of the AVE values were greater than the correlations among constructs, supporting discriminant validity. The CFA indicated acceptable model fit: χ^2/df=3.449, SRMR=.027, RMSEA=.040, and AGFI=.968, NFI=.971, IFI=.979, TLI=.973, and CFI=.979 (Hu & Bentler, 1999).

The modified mental health scale presented good reliability, with a Cronbach's alpha of .872. The standardized factor loadings (.636-.848), the CR (.880-.897), and the AVE (.512-.557) indicate adequate convergent validity. The square roots of the AVE values were greater than the correlations among constructs, supporting discriminant validity. The model fits of mental health were acceptable: χ^2/df=4.398, SRMR=.033, RMSEA=.047, and AGFI=.942, NFI=.949, IFI=.960, TLI=.955, and CFI=.960 (Hu & Bentler, 1999). The results supported a three-factor representation of the modified scale in this sample.

Gender and Academic-Year Differences

Table 1 presents the independent-samples t tests. The findings showed female students (M=4.166, SD=0.429) reported higher digital counselling service scores compared to male students (M=4.027, SD=0.382). The difference was statistically significant (t=6.766, p<.001), with a small effect size (Cohen's d=.341) (Field, 2013). Therefore, hypothesis 1 is supported, indicating that Chinese male and female undergraduates differ significantly in their use of digital counselling services.

Table 1 shows that female students exhibited better mental health status (M=4.395, SD=0.317) than male students (M=4.318, SD=0.297). The observed difference reached statistical significance (t=4.992, p<.001) and corresponded to a small effect size (Cohen's d=.252) (Field, 2013) between genders. These results support hypothesis 2.

Table 1

Gender differences in digital counselling service and mental health scores

Scale	Gender	M	SD	t	p	Cohen's d	Difference Comparison
Digital counselling services	Female (n=800)	4.166	0.429	6.766	< .001	.341	Female > Male
	Male (n=765)	4.027	0.382				
Mental health	Female (n=800)	4.395	0.317	4.992	< .001	.252	Female > Male
	Male (n=765)	4.318	0.297				

Note. Higher scores indicate more favorable service perceptions and fewer mental health symptoms. M = mean; SD = standard deviation.

According to Table 2, one-way ANOVA demonstrated that students' engagement with digital counselling services differed significantly by years of study (F=11.146, p<.001), with a small effect size (η^2 = .021) (Tabachnick & Fidell, 2013). Post-hoc comparisons showed that undergraduates in year 1 (M=4.189, SD=0.420) were more engaged in digital counselling services than their year 2 (M=4.037, SD=0.405), and year 3 (M=4.056, SD=0.394). In addition, year 4 students (M=4.122, SD=0.415) demonstrated greater engagement than year 2 students (M=4.037, SD=0.405). Across all years, year 1 and 4 students exhibited the strongest engagement with digital counselling services. These results support hypothesis 3, confirming that there are significant differences in digital counselling services based on their years of study among Chinese university students.

As shown in Table 2, one-way ANOVA revealed significant differences in mental health across students' years of study (F=37.294, p<.001), with a medium effect size (η^2 =.067) (Tabachnick & Fidell, 2013). The post-hoc analyses demonstrated that year 2 (M=3.956, SD=0.422) reported better mental health status than year 1 (M=3.816, SD=0.408) and year 3 (M=3.844, SD=0.447). Year 4 students (M=4.117, SD=0.470) reported better mental health status than year 1 (M=3.816, SD=0.408), year 2 (M=3.956, SD=0.422) and year 3 students (M=3.844, SD=0.447). These findings support hypothesis 4, indicating that Chinese undergraduates' mental health has significant differences by academic years.

Table 2

Academic-year differences in digital counselling service and mental health scores

Scale	Years of Study	M	SD	F	p	η^2	Post-hoc
Digital counselling services	Y1 (n=363)	4.189	0.420	11.146	< .001	.021	Y1 > Y2;
	Y2 (n=442)	4.037	0.405				Y1 > Y3;
	Y3 (n=368)	4.056	0.394				Y4 > Y2
	Y4 (n=392)	4.122	0.415				
Mental health	Y1 (n=363)	3.816	0.408	37.294	< .001	.067	Y2 > Y1; Y2 > Y3;
	Y2 (n=442)	3.956	0.422				Y4 > Y1; Y4 > Y2;
	Y3 (n=368)	3.844	0.447				Y4 > Y3
	Y4 (n=392)	4.117	0.470				

Note. Y1 = first year; Y2 = second year; Y3 = third year; Y4 = fourth year. M = mean; SD = standard deviation; η^2 = eta squared.

Table 3 presented the Pearson correlation coefficients. The results indicate a significant positive correlation between digital counselling services and mental health (r=.450, p<.001), indicating a moderate relationship (Field, 2013). This correlation supports the subsequent regression analyses.

Table 3

Pearson correlation between the study variables

Variables	Mental Health	Digital Counselling Services
Mental Health	1	
Digital Counselling Services	.450***	1

Note. ***p < .001.

Table 4 reported the multiple linear regression analysis. Prior to conducting the regression analysis, diagnostic tests were performed to examine the assumptions of linearity, homoscedasticity, and normality of residuals, and no serious violations were detected. The VIF values of collinearity statistics are between 1.044 and 2.624, below the threshold of 10 (Field, 2013), revealing no multicollinearity issues. After adjustment for gender and academic year, digital counselling services was significantly associated with mental health (β=.455, p<.001), indicating an association between more favorable service perceptions and higher reverse-scored mental health scores. The regression model explained a portion of the variance in mental health status (Adjusted R^2 = .323). These results demonstrate that greater engagement in digital counselling services is associated with better mental health among Chinese college students, thus supporting hypothesis 5.

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Table 4

Multiple linear regression predicting mental health scores

Predictor	B	SE	β	t	p	Tolerance	VIF
Intercept	1.700	.106	-	15.977	< .001	-	-
Control variables							
Male	-.137	.019	-.151	-7.086	< .001	.958	1.044
Year 2 students	.219	.034	.218	6.455	< .001	.381	2.624
Year 3 students	.098	.029	.092	3.415	.001	.603	1.657
Year 4 students	.298	.032	.286	9.193	< .001	.450	2.225
Independent variables							
Digital counselling services	.499	.024	.455	20.930	< .001	.918	1.089

Note. Gender was coded female = 0 and male = 1. Academic year was dummy coded with Year 1 as the reference group. Reported model statistics: $R^2 = .325$; adjusted $R^2 = .323$; $F(5, 1{,}559) = 150.13$, $p < .001$. B = unstandardized coefficient; SE = standard error; β = standardized coefficient; VIF = variance inflation factor.

Discussion

Gender and Academic-Year Differences

The study identified gender differences in digital counselling service scores, with female students reporting higher scores than male students. This is consistent with evidence that female students may be more willing to seek psychological support (Ning et al., 2022). UTAUT suggests that perceived usefulness, ease of use and social influence may help explain service acceptance (Anteneh et al., 2025). These findings concern reported perceptions and experiences; the scale does not provide an objective measure of use frequency.

Secondly, gender differences were found in mental health among Chinese undergraduates, which is not consistent with the prior research that among Chinese university students, females generally exhibit higher rates of depression, anxiety, and stress (Fan et al., 2025). Research suggests that females are more likely to report experiencing emotional distress, and also seek help and social support to mitigate this disparity (Ning et al., 2022). Therefore, the findings of this study indicate that the relationship between gender and mental health is complex and warrants further investigation into its underlying causes.

Academic-year differences were observed in digital counselling service scores. First-year students reported relatively favorable scores, which may reflect differences in information needs and familiarity with support resources (Li et al., 2023). This possible explanation requires further study. Digital mental health implementation should consider peer involvement, community engagement and the local university context (Sit et al., 2024).

Finally, the differences in mental health among Chinese university students were identified in terms of their years of study. This study found that the mental health scores of higher-grade students were slightly higher than those of some lower-grade students. One possible explanation may that students gradually adapt to academic and social environments during the university life. However, since this study was a cross-sectional study, future longitudinal research is needed to further validate the mechanisms underlying changes in mental health across different stages of university education.

Digital Counselling Services and Mental Health

Digital counselling service scores were positively associated with mental health scores. Students with more favorable service perceptions and experiences reported fewer symptoms on the reverse-scored mental health measure. This association is compatible with research describing digital resources as accessible routes to support (Riboldi et al., 2024; Torous et al., 2025). UTAUT also suggests that perceived usefulness and ease of use influence acceptance (Anteneh et al., 2025). However, better mental health may facilitate positive service perceptions, and unmeasured characteristics may influence both variables. The present association does not establish therapeutic effectiveness.

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Conclusion and Implications

Conclusion

Digital counselling service scores and reverse-scored mental health scores differed by gender and academic year among Chinese undergraduates. More favorable service perceptions were moderately associated with higher mental health scores, including after adjustment for gender and academic year. These findings support further investigation of digital counselling as a university support resource, while the cross-sectional design prevents conclusions about causality or treatment benefit.

Overall, this study provides new empirical evidence for the field of digital mental health and highlights the potential role of technology-supported mental health services in the provision of mental health services for university students.

Implications

The study applies UTAUT to digital counselling in higher education and identifies associations between service perceptions, demographic characteristics and mental health. Because the analysis did not test all UTAUT pathways, it should be viewed as a theory-informed application rather than a complete test of the model.

Universities may consider digital counselling as a supplement to face-to-face services, with accessible information and appropriate support for students at different academic stages. Implementation should also preserve privacy, human support and culturally responsive care (Seyed Alitabar, 2026; Zhang et al., 2025).

Limitations and Recommendations

Limitations

Firstly, this study employed a cross-sectional design, which precludes the ability to establish a causal relationship between digital counselling services and mental health. Future research would need to employ a longitudinal or experimental design to further validate these findings. Second, the data for this study were derived from self-report questionnaires, which may be subject to common method bias and social desirability bias. Third, the sample for this study was drawn from public universities in China, and a convenience sampling method was employed. Therefore, the generalizability of the findings is still somewhat limited.

The analysis included gender and academic year but did not account for socioeconomic status, digital literacy, mental health history, service quality or objectively recorded use frequency. The service scale requires further validation in independent samples. In addition, the modified five-point, reverse-scored DASS-based measure differs from standard administration, limiting comparability with published DASS-21 scores and clinical thresholds.

Recommendations

Longitudinal and experimental studies are needed to assess directionality and clinical effects. Future work should measure digital health literacy, actual service use and service quality alongside mental health. Co-design approaches may help make digital resources more accessible and relevant to young users (Lewis et al., 2024). Comparative studies across institutions and cultural settings could further examine generalizability.

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Declaration of Interest

The authors declare no competing interests.

Ethics Approval

Ethical approval was obtained for the study (DPUHREC007/68FB). The study followed the principles of the Declaration of Helsinki. Participation was voluntary, online informed consent was obtained before questionnaire completion, and participants' identities were anonymized.

Data Availability

The data supporting the findings of this study are not publicly available due to ethical restrictions and concerns regarding participant privacy.

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Author Contributions

All authors equally contribute to this study.

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