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The influence of internet information exposure on Chinese youth's intention of online psychological counseling: based on SOR theory and the mindful coping model

Yi Wang, Tianrui Qiao & Chao Liu✉

Psychological health is a prominent social issue worldwide and in China. Simultaneously, the rapid development of internet medical services in China provides a solid foundation for online psychological counseling. However, the cultural values of Chinese people often lead to a reluctance to pursue psychological counseling, adding to the complexity of the issue. The purpose of this study is to explore how information exposure, trait mindfulness, public stigma, and self-stigma among Chinese youth affect their intentions of seeking online psychological counseling. Based on the SOR (stimulus-organism-response) theory, combined with a mindful coping model, a structural equation model was constructed to analyze the path of the effects of information exposure, trait mindfulness, public stigma, and self-stigma on behavioral intention. A total of 671 valid questionnaires were collected through online surveys. First, SPSS 26.0 was used for questionnaire reliability and validity analysis, demographic characteristic difference testing, and correlation testing between variables. Secondly, Amos 26.0 was used to construct the structural equation model, verify the model fitting, identify the relationship between latent variables, and perform path testing. The study results indicate that (1) The intention of online psychological counseling among Chinese youth has significant differences in terms of age, occupation, monthly income, and previous counseling experiences. (2) Information exposure positively affects counseling intention (β = 0.434, *P* < 0.001), Trait mindfulness positively affects counseling intention (β = 0.100, *P* < 0.05), information exposure doesn't significantly affect public stigma (β = 0.015, *P* = 0.727), information exposure negatively affects self-stigma (β = −0.079, *P* < 0.05), mindfulness character negatively affects public stigma (β = −0.421, *P* < 0.001), mindfulness character negatively affects self-stigma (β = −0.115, *P* < 0.001), public stigma positively affects self-stigma (β = −0.766, *P* < 0.001), public stigma negatively affects counseling intention (β = −0.234, *P* < 0.01), and self-stigma negatively affects counseling intention (β = −0.248, *P* < 0.001). Combining the SOR theory with the mindful coping model, it has been found that information exposure and trait mindfulness positively affect counseling intention, information exposure doesn't affect public stigma but negatively affects self-stigma, trait mindfulness negatively affects both public and self-stigma, and both public stigma and self-stigma negatively affect counseling intention. This study provides a sample for the SOR theory and the mindful coping model, and provides new insights and path support for individuals resisting the stigma of psychological illness and seeking professional help under Eastern cultural values.

Keywords Online psychological counseling, SOR, Trait mindfulness, Stigma

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Mental health issues represent a significant global public health concern, and also stand out as prominent social issues in China. With the popularity of the Internet, "online counselings" have rapidly developed. According to the 53rd "China Internet Development Statistics Report" by the China Internet Network Information Center (CNNIC)[1], as of December 2023, the size of Chinese netizens reached 1.092 billion, and the size of Internet medical users accounted for 37.9% of the total netizens, and showing a growing trend. With the successive introduction of a series of Chinese government documents, the integration of Internet technology and medical health has become more standardized and in-depth.

China's mental health industry started late, but have developed rapidly[2], with many excellent professional psychological counseling agencies emerging continually[3].Online psychological counseling, as an online form of psychological counseling, combines traditional offline counseling with rapidly developing information and communication technology. It has some advantages and is suitable for the growing psychological health needs of today's society[4].

Despite an increasing number of people holding an optimistic attitude towards seeking psychological support through online psychological counseling, the conversion rate of individual actual willingness to action is relatively low[5]. Chinese cultural values "moralize" psychological problems to a certain extent, and consider psychological counseling to be a manifestation of "incompetence"[6]. Coupled with the influence of collectivism, people with psychological problems are ashamed to express themselves and are afraid to seek counseling[7]. In summary, Chinese individuals are more resistant to psychological counseling than Westerners[8], and related explorations are limited[9].

Stimulus-Organism-Response theory (SOR theory) has been applied in the field of online behavior and health communication, but there is still insufficient discussion on the application and scope of application under the combination of the two[10]. Meanwhile, the SOR theory alone tends to treat individual behavior as emotionally driven under stimuli[11]. So this study introduces positive thoughts, a stable individual trait, and tries to add individual rationality dimensions to make up for the shortcomings.

Based on the aforementioned background, this research aims to discuss the mechanisms impacting the intention of Chinese youth to seek online psychological counseling. This research, based on the SOR theory and combined with the Mindful Coping Model, attempts to construct a structural equation model to explore the unique factors and potential mechanisms that drive the intention of online psychological counseling. The research findings will deepen our understanding of the psychological and sociocultural factors impacting Chinese individuals' intentions toward online psychological counseling.

Theoretical background and research hypotheses

Theoretical background

SOR theory

The Stimulus-Organism-Response Theory (SOR theory), as one of the basic theories in the field of psychology researching human behavior, is gradually developed based on the Stimuli-Response Theory (SR theory). And it has been developed under the gradual refinement of Woodworth, Tolman, Mehrabian, and Russell[12,13].

SOR theory proposes that when an individual is stimulated by external cues (S), certain cognition or emotion (O) arises in the individual's mind, which, in turn, triggers the individual's response (R)[14]. This is a theoretical model exploring the impact of external environmental stimulus factors on individual cognitive or emotional responses and further predicting responsive behaviors[12]. It also indicates that external stimuli can enhance people's internal state[15] .

The validity of SOR theory has been empirically tested in multiple areas and is increasingly applied in the research area of Internet user behavior[16]like studying online behavior with a computer as a medium[17], investigating online users' behavioral responses to information[18], information searching behavior and their response[19,20], etc. SOR theory has also been widely used in the field of health communication, such as online counseling intention[21], the discontinuous use of smart health bracelets[22], the use of mHealth app[23], impulsive purchasing of medical protective equipment[24], vaccine inoculation[25], health information processing[26]and avoidance[27], etc.

Stimulus (S) refers to external factors of the individual. Existing studies have treated information and related behavior as stimulus in SOR theory, such as media information like TV, newspapers[14], information seeking behavior[19,20], etc. Research shows that overall, obtaining sufficient information can bring about positive health behaviors[27]. Information on the Internet such as social media has been proven to influence individuals' cognition, attitude, and changes towards health behavior[28–30]. Therefore, internet information exposure can be regarded as Stimulus (S).

Organism (O) refers to the internal state of organism, represented by emotions and cognitive status[31], and it is also considered as an intermediate state between stimulus and response[32]. Stimuli from the environment, etc., can make individuals generate a cognitive stigma for seeking professional psychological help. And the extent to which the information stigmatizes the individual has also been demonstrated[33]. Professional help-seeking stigma is the main perception individuals have of professional help-seeking and is the main barrier that prevents individuals from seeking counseling[34,35]. Therefore, perceived can be regarded as Organism (O).

Response (R) refers to behaviors and intentions based on cognition and emotions[36]. Approach and avoidance behaviors or intentions can all be viewed as responses[37]. It has been proven in studies that the stronger the individuals' intention to carry out a particular behavior, the more likely they are to implement it[38]. Intention has been proven to be an effective predictor of actual behavior, and the measurement of behavioral intention as an alternative to actual behavior is relatively common[39,40]which has been verified in various studies with different themes such as smoking[41], drinking[42], breastfeeding[43], and physical activities[44]. Therefore, the intention of online psychological counseling can be regarded as Response (R).

The SOR theory has been proven to effectively explain the psychological response and behavioral response of internet users facing information stimulus. Users' emotions are complex and significantly influence user behavior, but the sole use of the SOR model ignores the complexity of an individual's emotions[45]and the influence of individual differences[46] .

In particular, it has been demonstrated that the SOR model alone tends to treat individual behavior as perceptually driven under stimuli[11], so the influence of individual rationality on the body's response to stimuli also needs to be considered. Trait mindfulness, as a stable ability of individuals to purposefully pay attention to and be aware of the present experience[47], allows individuals to view the stimuli they face from a rational perspective to a certain extent. Therefore, we introduce the individual trait mindfulness on the basis of the SOR theory.

The mindful coping model

Mindfulness refers to consciously focusing attention on the present moment, with an open and accepting attitude towards current experiences or perceptions[48]. Trait mindfulness refers to the individual's ability to purposefully, non-judgmentally, attend and be aware of current experiences[47], reflecting the individual's stable mindfulness level in daily life[49]. The concept and practice of mindfulness have attracted significant attention from researchers and psychological health practitioners worldwide, aiming to use mindfulness to deal with various mental disorders and general well-being[50–53].

The Mindful Coping Model, proposed by Garland et al., posits that individuals use mindfulness as an inherent element to deal with stimuli brought about by situations or events they face, decentering situations, forming positive reappraisals[54], thereby promoting adaptive physical and mental responses of individuals[55]. Various types of information on the Internet have different stimuli for the individual user, especially negative information about mental health problems, which often brings negative emotions.

The individual's rational and stable trait of positive thinking affect to the psychological impact of information stimuli out of a protective role[56], and works together with the stimuli on the organism and responses. These two are "perceptually driven" and "rationality driven", with internal states of the organism such as perceived stigmas acting as perceptually driven stimulated by information, and trait positive thoughts playing an important role as rationally driven. Existing research proved that individuals with a higher level of mindfulness perceive negative emotions lower[57], and mindfulness can negatively affect individuals' negative affectivity responses[58,59].

Based on the specificity of psychological topics and the shortcomings of the SOR theory, this study combined the SOR theory with the Mindful Coping Model to investigate the predictive ability of this localized model.

Research hypotheses

Internet information exposure

The positive impact of internet information on individual health behavior implementation has been empirically verified[60,61]. Health information is a crucial factor to help individuals make the right health behavior decisions[62,63]. Adequate acquisition and exposure to health information can promote health behavior[64]. Existing research has shown that internet information exposure positively affects health behaviors, such as skin cancer prevention[65], vaccination[66], etc.

Hence, we propose the hypothesis:

H1: Internet information exposure positively influences the intention for online psychological counseling.

Trait mindfulness

The Mindful Coping Model elaborates on the effect of mindfulness on negative emotions[67]. The level of mindfulness is related to physical health[68], i.e., mindfulness can improve health by associating with health behavior[69]. A high level of mindfulness can increase health-promoting behaviors (healthy eating, exercise, etc.) or reduce health risk behavior[70,71].

Hence, we propose the hypothesis:

H2: Trait mindfulness positively influences the intention for online psychological counseling.

Stigma for seeking professional psychological help

Stigma refers to the humiliating attribute of an individual from a complete ordinary person to a tainted person, which is the connection constructed by society between characteristics and stereotypes[72]. The stigma for seeking psychological help is the embodiment of stigma in the field of seeking psychological help and mainly divided into public stigma and self-stigma[73]. The public stigma for seeking psychological help refers to the negative inherent impression of individuals seeking psychological help. The self-stigma for seeking psychological help refers to the impact of negative stereotypes on individuals when considering whether to seek psychological help[74].

There is no lack of coverage of psychological problems and related events on the Internet, but the use of stigmatizing frames[75], coupled with the rise of some subcultural trends, has led to a high level of stigmatization of psychological problems, especially among the groups of people suffering from depression[76]and mental illnesses[77–79]. Such information on the Internet not only deepens the public's misconceptions and stereotypes about people with mental illnesses, but also traps the patients themselves in self-denial and stigmatization, and creates a stigma against seeking psychological help[80].As previous studies have shown, information exposure improves individuals' cognition of mental health while also increasing their perceived stigma[81]. This is also consistent with theories such as the health belief model, where independent variables affect outcome variables through different cognitive and emotional pathways.

Hence, we propose the hypotheses:

H3: Internet information exposure positively affects the public stigma for seeking professional psychological help.

H4: Internet information exposure positively affects the self-stigma for seeking professional psychological help.

As described in the Mindful Coping Model, trait mindfulness serves as an antecedent variable that improves an individual's perception of things. Existing research shows that individuals with high trait mindfulness can more objectively cope with situations and make more appropriate reflections[82], and have more adaptive emotional affecting skills[83]. High mindfulness level can be an important protective factor for mental health[56]and have a negative effect on negative emotions and their effects[84,85]. Psychological help stigma, as a product of societal "labeling" and "stereotyping", can also be seen to some extent as a perceptually-driven negative emotion brought about by discrimination, and rationality-driven trait positivity can reduce this[86].Hence, we propose the hypotheses:

H5: Trait mindfulness negatively affects the public stigma for seeking professional psychological help.

H6: Trait mindfulness negatively affects the self-stigma for seeking professional psychological help.

Self-stigma is also considered as an internalization of the stigma view held by the public[87,88], and existing research has shown that public stigma is significantly positively correlated with self-stigma[89–91].

Hence, we propose the hypothesis:

H7: The public stigma for seeking professional psychological help positively affects the self-stigma for seeking professional psychological help.

The stigma for seeking psychological help is a significant barrier to individuals seeking psychological help[33]. Currently, the academia mostly believes that the stigma for seeking psychological help negatively affects psychological health behaviors and intentions[92,93].

Hence, we propose the hypotheses:

H8: The public stigma for seeking professional psychological help negatively affects online psychological counseling.

H9: The self-stigma for seeking professional psychological help negatively affects online psychological counseling.

Based on the above analysis, the study uses the SOR theory framework combined with the Mindful Coping Model, regarding internet information exposure as the stimulus, the stigma for seeking professional psychological help as organisms, the intention of online psychological counseling as responses, and introduces trait mindfulness to explore the impact mechanism of Chinese individual's intention of online psychological counseling. The research model constructed by connecting all variables and hypotheses is shown in the Fig. 1, which consists of 5 main variables and 9 hypotheses.

Methods

Data collection

Convenience sampling was conducted in this study through an online questionnaire, which were distributed and collected via social media platforms like WeChat, QQ, Weibo, Douban, etc. Ensuring the privacy of questionnaire participants will be strictly protected, the data collection is divided into two stages: pre-survey and formal survey.

The first stage is the pre-survey, which is conducted before the formal survey to help the participants of the formal survey better understand the questions and effectively fill out the questionnaire, and a preliminary measurement of the reliability and validity of the questionnaire. It started on March 10, 2024, collected 134

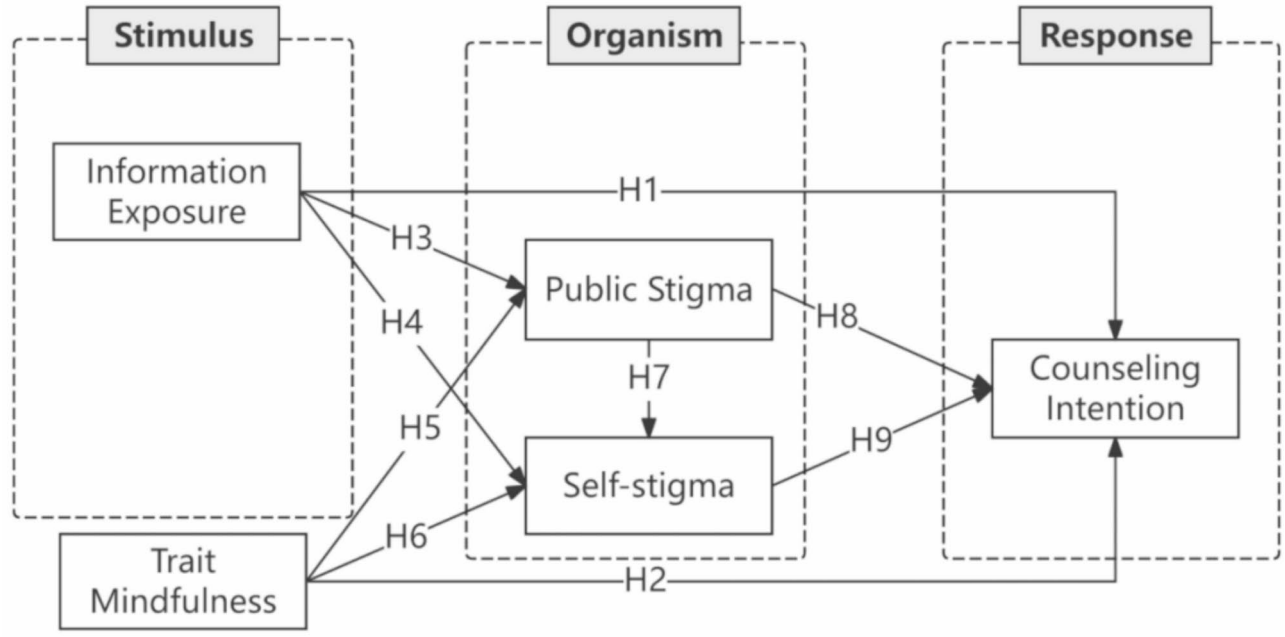

Fig. 1. Research model.

questionnaires, with 107 valid ones, and adjusted and revised the questionnaire based on reliability and validity results.

The second stage is the formal survey. It started on March 18, 2024, and ended on March 28, 2024, with a total collection of 734 questionnaires. The sample size of the study was determined at a ratio of 1:10 with the observed variables[94], the survey questionnaire in this study has a total of 33 observed variables, indicating the minimum sample size required is 330. The World Health Organization classifies young people as being aged 15–44 years[95]. Ultimately, participants selecting "≤14" and "≥45" for "age" are excluded. After excluding 63 invalid samples (those not fitting the age range of the study, incomplete answers, too short answering time, repetitive filling from the same IP address etc.), the final valid questionnaire number is 671, with an effectiveness rate of 91.4%, meeting the sample size requirements of the study.

The demographical features of the participants are as shown in Table 1. Among the 671 valid participants, 48.6% were male, 51.6% were female. Age-wise, the largest proportion was 20–25 years old accounting for 38.9%, followed by 25–29 years old accounting for 17.6%. In terms of educational background, most participants hold undergraduate degrees or above, with 68.9% undergraduate degrees, 19.1% master's degrees, and 0.7% doctoral degrees. Occupation-wise, the majority were students making up 42.3%, followed by company employees making up 36.1%. Monthly income-wise, the largest proportion was ≤ 3000 yuan accounting for 37.4%, followed by 3,501-6,000 yuan accounting for 23%. In terms of marital status, 65.1% were unmarried, 34.9% were married. With regard to experience related to psychological counseling, 40.2% had never experienced any form of psychological counseling, while 36.4% had had online psychological counselings. In summary, the sample meets the requirements of the target group for our research.

Measures

The questionnaire in this study is composed of 5 parts, including demographic data of participants, internet information exposure, stigma for seeking professional psychological help, trait mindfulness, and intention of

Characteristic	Demographic information	Frequency	Percentage (%)
Gender	Male	326	48.6
	Female	345	51.4
Age	15–19	79	11.8
	20–24	261	38.9
	25–29	118	17.6
	30–34	83	12.4
	35–39	62	9.2
	40–44	68	10.1
Education	Junior High School and below	12	1.8
	Senior High School	17	2.5
	Junior college	47	7.0
	Bachelor degree	462	68.9
	Master's degree	128	19.1
	Doctoral degree	5	0.7
Professional	Student	284	42.3
	Corporate employees	242	36.1
	Civil servant or public institution personnel	87	13.0
	Freelance	44	6.6
	Not employed/unemployed	5	0.7
	other	9	1.3
Monthly	≤ 3000	251	37.4
Income	3,001–6,000	154	23.0
(CNY)	6,001–9,000	126	18.8
	9,001–12,000	80	11.9
	≥ 12,001	60	8.9
Marital status	Single	437	65.1
	Married	234	34.9
Experiences	Experienced in offline psychological counseling	131	19.5
Related to	Experienced in online psychological counseling	244	36.4
Online	Currently undergoing offline psychological counseling	19	2.8
Psychological	Currently undergoing online psychological counseling	7	1.0
Counseling	Never experienced in offline psychological counseling	270	40.2
	or online psychological counseling		

Table 1. Demographic characteristics of participants ($N = 671$). "CNY" refers to the China Yuan.

online psychological counseling. All scales come from mature scales in published academic papers. Considering that the survey was carried out in China and all participants are Chinese, the research team conducted a cross-cultural adaptation translation process. Using the method of "two-way translation", the English scales were translated. First, a Ph.D. researcher carried out forward translation into Chinese, then a master's student proficient in English conducted backward translation into English to ensure the accuracy and unambiguity of the questionnaire content.

Internet information exposure
Based on the questionnaire by Hay, J. et al.[65], and considering the research questions and practical context, this study made modifications. Referring to Hay J et al.'s questionnaire and modifying it according to the research questions and the actual situation, such as mentioning the Internet platforms frequently used by the Chinese people. This uses 4 items measured with sample questions including "Have you ever been exposed to information about mental health on internet platforms such as Weibo, Xiaohongshu, Douban, Zhihu etc.", "Have you ever searched for information about online psychological counseling on internet platforms such as Weibo, Xiaohongshu, Douban, Zhihu etc.". The question items were all measured on a 5-point Likert scale, from 1 to 5 respectively correspond to "strongly disagree" to "strongly agree". The internal consistency coefficient of this scale (Cronbach's alpha) is good ($\alpha = 0.805$, $M = 3.803$, $SD = 0.723$).

Trait mindfulness
The Mindful Attention Awareness Scale (MAAS)[47] was utilized in this scale, example question: "I could be experiencing some emotion and not be conscious of it until some time later.", "I find it difficult to stay focused on what's happening in the present.", etc. The scale was developed by Brown and Ryan, with a total of 15 items. A 6-point Likert scale is used, where 1–6 correspond to "almost always" to "almost never". A higher MAAS score indicates a higher level of mindfulness, implying that individuals display higher attention in their daily lives. The internal consistency coefficient of this scale (Cronbach's alpha) is good ($\alpha = 0.925$, $M = 3.860$, $SD = 0.902$).

Stigma for seeking professional psychological help
The scale used was Stigma for Seeking Professional Psychological Help (SSPPH)[96]. The scale was revised by Hao Zhihong and Liang Baoyong based on Corrigan's[97]division of stigma, the SSRPH[74]by Komiya et al., and SSOSH[73] by Vogel et al., to develop a scale of stigma for seeking professional psychological help that conforms to Chinese cultural characteristics. The scale includes a total of 10 items, with sample questions including "I would feel dissatisfied with myself if I went to online counseling", "People generally don't like those who have received online counseling very much", etc. It contains two dimensions: self-stigma and public stigma, each with 5 items. The internal consistency coefficients of the public stigma ($\alpha = 0.887$, $M = 2.325$, $SD = 0.938$) and self-stigma scales ($\alpha = 0.874$, $M = 2.466$, $SD = 0.909$) are good.

Intentions of online psychological counseling
Refer to the questionnaire by Wang Y et al.[98], and modified according to study questions and actual conditions, example question: "I would consider seeking online counseling.", "I am willing to seek online counseling", etc. This uses 4 items measured by a 5-point Likert scale, from 1 to 5 respectively correspond to "strongly disagree" to "strongly agree". The internal consistency coefficient of this scale (Cronbach's alpha) is good ($\alpha = 0.873$, $M = 3.854$, $SD = 0.768$).

Data analysis methods
This study utilized IBM-SPSS 26.0 and IBM-SPSS-Amos 26.0 for data processing and analysis. SPSS was used for descriptive statistical analysis, independent sample *t*-tests, reliability analysis, one-way analysis of variance (one-way ANOVA). Amos was used for confirmatory factor analysis, to construct a structural equation model (SEM) and describe goodness of fit, including path coefficients (β), etc., and to identify the influence relationship between latent variables.

Statement
This study was reviewed and approved by the Academic Committee of the School of Journalism and Communication of Huaqiao University. Written informed consent from the subjects or their legal guardian(s) was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Data analysis results
Differential testing of demographic characteristics
In order to test the differences in the intention of online psychological counseling among Chinese youth with different demographic characteristics, this study utilized SPSS 26 for independent sample *t*-tests and one-way analysis of variance (one-way ANOVA). The premise of one-way ANOVA is to ensure the variance homogeneity among each independent group, so a test of variant homogeneity was conducted first. In the result of variant homogeneity test, if the P-value is less than 0.05, it means that the variance is not homogeneous, if the P-value is more than 0.05, the ANOVA test result is taken as the final result[99], as shown in Table 2. The results show that there are significant differences in the intention of online psychological counseling among Chinese youth with different ages, occupations, monthly income, and experiences related to psychological counseling (P-value < 0.05). In general, those in the sample who are in the age range of 30–34, with a monthly income of 6,001–9,000 yuan, other occupations (not business employees, civil servants, freelancers, or unemployed/unemployed), and currently undergoing online psychological counseling have higher counseling intention.

Characteristic	Demographic information	t, F, or *r*	*P*-value	M	SD
Gender	Male	−0.905	0.366	3.827	0.769
	Female			3.880	0.768
Age*	15–19 (a)	2.992	0.011	3.623	0.869
	20–24 (b)	a< b< f<		3.820	0.736
	25–29 (c)	e< c< d		3.953	0.671
	30–34 (d)			4.045	0.739
	35–39 (e)			3.855	0.834
	40–44 (f)			3.849	0.840
Education	Junior High School and below	1.492	0.190	3.583	0.779
	Senior High School			3.603	0.956
	Junior college			3.670	0.903
	Bachelor degree			3.883	0.747
	Master's degree			3.887	0.754
	Doctoral degree			3.600	0.894
Professional*	Student (a)	5.681	0.000	3.828	0.756
	Corporate employees (b)	d< e< c<		4.013	0.698
	Civil servant or public institution personnel (c)	a< b< f		3.678	0.785
	Freelance (d)			3.477	0.937
	Not employed/unemployed (e)			3.600	1.342
	Other (f)			4.111	0.546
Monthly	≤3000 (a)	3.407	0.009	3.817	0.745
Income	3,001–6,000 (b)	e< b< d		3.888	0.732
(CNY)*	6,001–9,0001 (c)	< a< c		3.738	0.851
	9,001–12,000 (d)			3.859	0.801
	≥12,001 (e)			4.163	0.664
Marital status	Single	−1.301	0.194	3.826	0.754
	Married			3.907	0.793
Experiences	Experienced in offline psychological counseling (a)	15.442	0.000	3.824	0.805
Related to	Experienced in online psychological counseling (b)	c< e< a		4.113	0.627
Online	Currently undergoing offline psychological counseling (c)	< b< d		3.250	0.993
Psychological	Currently undergoing online psychological counseling (d)			4.214	0.443
Counseling*	Never experienced in offline psychological counseling			3.669	0.779
	or online psychological counseling (e)				

Table 2. Differential testing of demographic characteristics in behavior (*N*=671).

Confirmatory factor analysis

In this study, common method bias was controlled procedurally through anonymous measurements. The collected data underwent Harman's single factor test using SPSS26.0. The results showed that there are 5 unrotated factors with eigenvalues greater than 1, with the maximum factor variance explained at 31.275%, less than the critical standard of 40%. Therefore, it can be judged that the common method bias of the data in this study is acceptable.

To measure the variables in our study, we referenced mature scale from existing studies and slightly revised it to fit the scope of this study, and the validation was conducted through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

Initially, the questionnaire content's KMO value was found to be 0.936 (>0.7) and the Bartlett's test of sphericity was $P=0.000$ (<0.05), indicating it was very suitable for factor analysis. Using principal component analysis method and maximum variance rotation method, after 6 rotations, there were 5 factors with eigenvalues greater than 1, and the cumulative variance contribution rate was 60.554% (>60%).

Amos26.0 was used to perform confirmatory factor analysis on the scale. (See Fig. 2) The factor loadings of each item range from 0.559 to 0.834, which are all above the threshold of 0.5, indicating that each latent variable's measurement indicators are highly correlated, with high convergence validity. The questionnaire items were deemed reasonable.

Reliability and validity testing

This study utilizes Cronbach's Alpha as the evaluation standard for measuring item reliability. As shown in Table 3, the Cronbach coefficient values of each variable are between 0.805 and 0.925, all greater than 0.8, indicating that the measurement items of this study have good credibility and strong internal consistency.

Validity test depends on 3 aspects: content validity, convergent validity, and discriminant validity. Firstly, in terms of content validity, this study adapted mature scales from existing research and obtained good preliminary

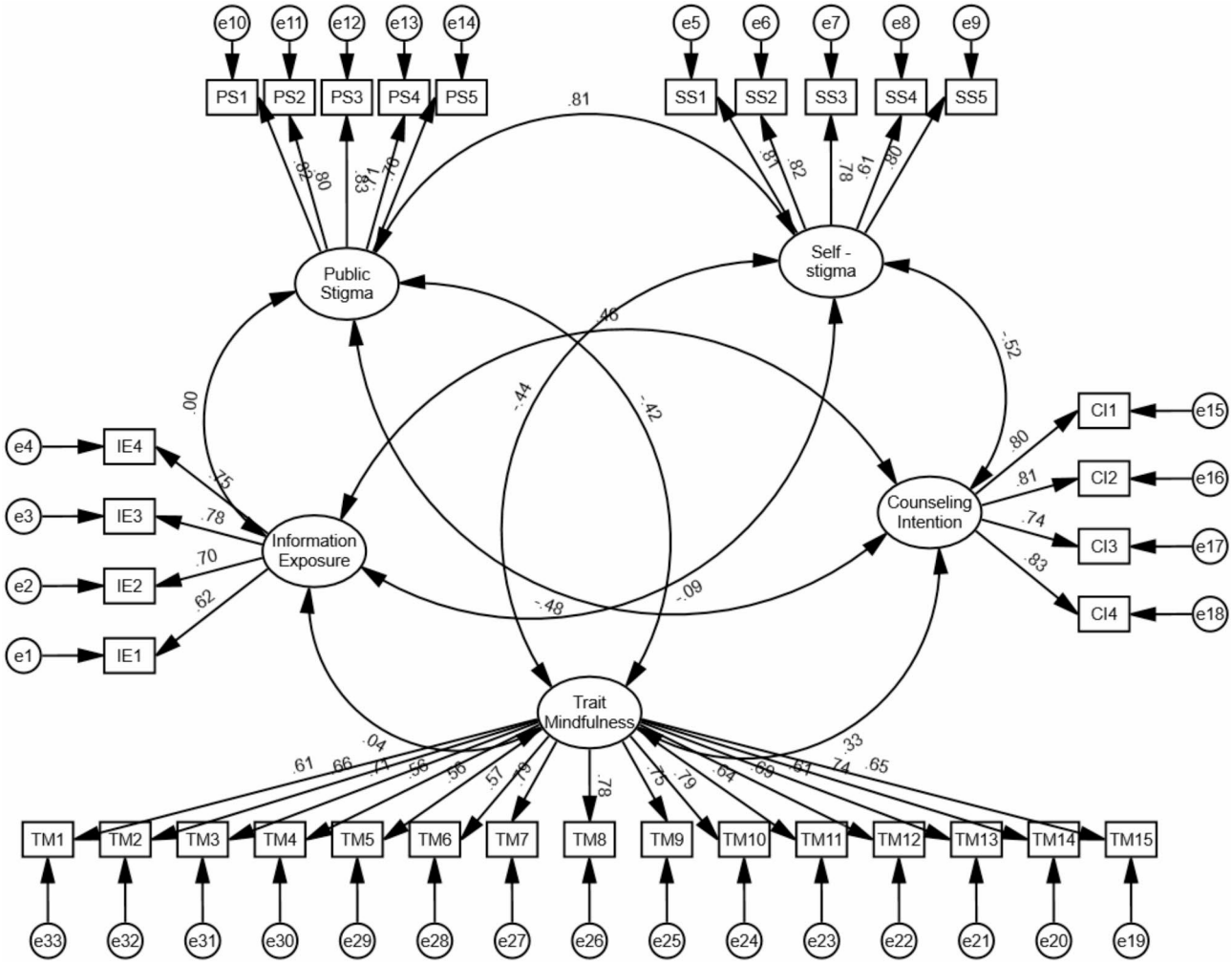

Fig. 2. Confirmatory factor analysis.

Latent variables	Cronbach's Alpha	AVE	CR
Information Exposure	0.805	0.512	0.806
Trait Mindfulness	0.925	0.460	0.927
Public Stigma	0.887	0.613	0.887
Self-stigma	0.874	0.593	0.878
Counseling Intention	0.873	0.636	0.875

Table 3. Reliability and convergence validity testing results. CR is the composite reliability; AVE is the average variance extracted

survey results, which guarantees the content validity of all measurement items in this study. In terms of convergent validity, as shown in Tables 3 and 4, in this study, the factor loadings of all measurement items are greater than 0.5, and the combined reliability (CR) of each latent variable is more than 0.8. Except for trait mindfulness, the average variance extracted (AVE) of each latent variable is greater than 0.5. Although the AVE of trait mindfulness is slightly less than 0.5, its CR exceeds 0.6 and is still considered valid[100]. All three criteria of convergent validity are met, demonstrating that all measurement items in this study have good convergent validity.

In terms of discriminant validity, as shown in Table 4, the correlation coefficients between latent variables are all less than the square root of AVE, indicating that all measurement items in this study have good discriminant validity.

Through the above analysis, it can be seen that the questionnaire design of this study is reasonable and has good reliability and validity. To measure the effectiveness and rationality of the model design, further structural model fit analysis can be performed.

	Information exposure	Trait mindfulness	Public stigma	Self-stigma	Counseling intention
Information Exposure	**0.715**				
Trait Mindfulness	0.032	**0.678**			
Public Stigma	−0.002	−0.382***	**0.783**		
Self-stigma	−0.057	−0.389***	0.650***	**0.770**	
Counseling Intention	0.236***	0.225***	−0.299***	−0.316***	**0.798**

Table 4. Discriminant validity testing results. The bold values indicate the square root of AVE

Index	x2/df	RMSEA	SRMR	CFI	TLI
Observed value	2.699	0.05	0.0422	0.93	0.924
Ideal value	<5	<0.08	<0.08	>0.9	>0.9

Table 5. Model fitting indexes after modification. x2/df, the relative chi-square;. RMSEA, the root means square error of approximation;. SRMR, standardized root means square residual;. TLI, Tucker-Lewis index;. CFl, comparative fit index.

Model fitting

This study utilized Amos 26 to construct a structural equation model and evaluate its fit. The model fit used the following suggested standards: (1) relative chi-square (x2/df) should be between 1 and 5; (2) root mean square error of approximation (RMSEA) should be less than 0.08; (3) standardized root mean square residual (SRMR) should be less than 0.08; (4) Tucker-Lewis index (TLI) should be greater than 0.9; (5) comparative fit index (CFI) should be greater than 0.9.

Firstly, a direct evaluation of the initial structural equation model was carried out. The results showed that the value of x2/df is 2.699, the value of RMSEA is 0.05, the value of SRMR is 0.0422, the value of TLI is 0.924, and the CFI value is 0.93. All indicators meet the fitting standards, the model fitting effect is ideal, and it fits well with the sample data, as shown in Table 5.

Hypothesis testing

Amos26 was used to analyze the 9 paths of the structural equation model in this study. The path coefficient diagram and hypothesis testing results are shown in Fig. 3; Table 6. The results show that the P value of H1, H2, H4, H5, H6, H7, H8, H9 is less than 0.05, indicating a significant correlation, showing that these 8 paths are connected. Information exposure has a positive effect on counseling intention ($\beta = 0.434$, $P < 0.001$), thus H1 is supported. Trait mindfulness positively affects counseling intention ($\beta = 0.100$, $P < 0.05$), thus H2 is supported. The influence of information exposure on public stigma is not significant ($\beta = 0.015$, $P = 0.727$), thus H3 is not supported. Information exposure negatively affects self-stigma ($\beta = -0.079$, $P < 0.05$), thus H4 is not supported. Trait mindfulness negatively affects public stigma ($\beta = -0.421$, $P < 0.001$), thus H5 is supported. Trait mindfulness negatively affects self-stigma ($\beta = -0.115$, $P < 0.001$), thus H6 is supported. Public stigma positively affects self-stigma ($\beta = 0.766$, $P < 0.001$), thus H7 is supported. Public stigma negatively affects counseling intention ($\beta = -0.234$, $P < 0.05$), thus H8 is supported. Self-stigma negatively affects counseling intention ($\beta = -0.248$, $P < 0.001$), thus H9 is supported.

In summary, H1, H2, H5, H6, H7, H8, and H9 are supported.

Discussion

This study combines the SOR theory with the mindful coping model, considers information exposure as Stimulus, public stigma and self-stigma as Organism, and willingness to consult as Response, and introduces trait mindfulness as an individual trait to construct a localized model suitable for the Chinese context. The model takes into account the fact that individuals' willingness to engage in healthy behaviors is influenced by external stimuli, individual traits, and rational judgment and perceptual perception. The model also applies SOR theory to the organic integration of online behavior and psychological issues, and provides empirical evidence for the importance of trait mindfulness for mental health in the digital age.

Information exposure and stigma for seeking professional psychological help (H3, H4)

As illustrated in H3, the exposure to information of Chinese youth does not impact the public stigma for seeking professional psychological help.

While some studies have shown that the internet can affect individuals' stereotypical impressions of seeking professional psychological help, other research has found that digital technologies like the internet and social media have a relatively minor impact on negative cognition among individuals[101–104]. This is due to the intricate influence of internet information on individual cognitive realms such as psychological health and stigma, an influence that is subject to variations among individual experiences[105]- a factor which has garnered more acknowledgement[115]. Studies have also shown that the phenomenon of health information avoidance is quite common[106,107]. Given the vast amount and uncertain quality of health information on the internet[108], individuals

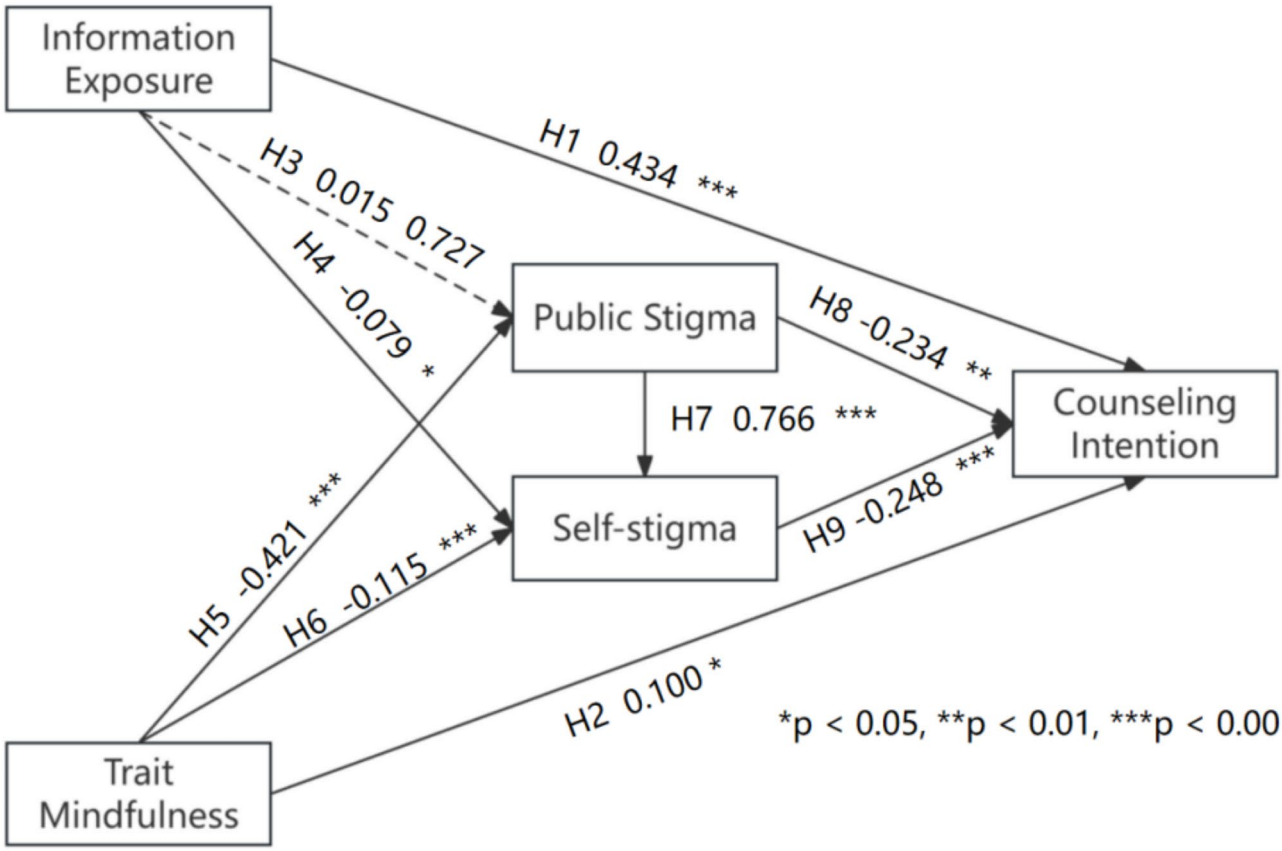

Fig. 3. Path coefficients of the proposed model.

Hypothesis	Model Paths	Path coefficients(β)	*P*-values	Results
H1	Information Exposure → Counseling Intention	0.434	***	Supported
H2	Trait Mindfulness → Counseling Intention	0.100	0.011	Supported
H3	Information Exposure → Public Stigma	0.015	0.727	Not supported
H4	Information Exposure → Self-stigma	−0.079	0.011	Not supported
H5	Trait Mindfulness → Public Stigma	−0.421	***	Supported
H6	Trait Mindfulness → Self-stigma	−0.115	***	Supported
H7	Public Stigma → Self-stigma	0.766	***	Supported
H8	Public Stigma → Counseling Intention	−0.234	0.001	Supported
H9	Self-stigma → Counseling Intention	−0.248	***	Supported

Table 6. Hypothesis testing results.

may actively avoid the cognitive impact of health information[109]. Therefore, exposure to such information does not affect public stigma.

As H4 suggests, exposure to information among Chinese youth has a negative impact on their self-stigma for seeking professional psychological help.

The result that information exposure negatively impacts self-stigma is somewhat surprising. Legislation in China has stipulated that "news reports and literary and artistic works must not contain content discriminating or slandering mental disease patients." Additionally, mainstream media reports concerning psychological health issues are becoming increasingly objective and neutral, often serving primarily as public education, and are not devoid of "humanistic care." There are also instances of public figures voluntarily sharing personal experiences related to psychological health issues or disclosing their history of psychological illness. These contributions all help individuals improve their understanding and awareness regarding psychological health issues. Previous research, utilizing text analysis, inferred that depression-related information on Chinese social media can be categorized into themes such as "anti-stigmatization," "call for understanding," and "provision of support."[110] Experiences of self-compassion, self-pity, or social support felt within these themes all contribute towards

reducing self-stigma for seeking professional psychological help among individuals. Thus, the exposure to information exerts a negative influence on self-stigma.

Trait mindfulness and stigma for seeking professional psychological help (H5, H6, H7)

Research has discovered, as shown in H5 and H6, that the trait mindfulness of Chinese youth has a negative impact on public stigma and self-stigma for seeking professional psychological help. This is consistent with the research results of Chan et al.[111]. Mindfulness is distinguished from "habitual, unconscious states," emphasizing the ability to non-judgmentally guide and sustain attention[112]. A high level of mindfulness can provide cognitive flexibility for individuals, create new perspectives and psychological resources, positively construct current experiences, reduce negative emotions, and adjust to changes and challenges[113]. There is a negative correlation between mindfulness and psychological distress[114,115], having a significant impact on reducing mental suffering[116–118]. The widespread evidence of the negative relationship between mindfulness and stigma[119,120], through positive and effective re-evaluation to reduce the degree of stigma[121], suggests improving the level of mindfulness is seen as an effective method to alleviate stigma[122–125]. Therefore, the higher the trait mindfulness, the lower the public stigma and self-stigma.

As shown in H7, there is a significant positive correlation between public stigma related to professional psychological help-seeking and self-stigma, consistent with the research findings of Jennings et al.[89,126]. Studies have shown that individuals receive more negative evaluations due to negative labels associated with professional psychological help-seeking[127]. The stigmatizing views of the public cause individuals to associate it with themselves, integrate it into their own evaluation system, and generate self-stigma[33,128]. After perceiving the public stigma such as social negative evaluation of professional psychological help-seeking, individuals will further internalize it, lower their self-evaluation on professional psychological help-seeking, and increase self-stigma[33,129]. Therefore, the higher the public stigma of the individual, the higher the self-stigma.

Information exposure, trait mindfulness, stigma for seeking professional psychological help, and counseling intention (H1 H2 H8 H9).

As shown in H1, the information exposure of Chinese youth has a positive impact on their intention of online psychological counseling. Apart from providing information, the internet plays a pivotal role in enhancing the level of health knowledge and promoting healthy behaviors[130]. The mere exposure effect[131] of information exposure suggests that individuals can develop a positive attitude under the repeated stimulation of receiving information. The vast amount of health information on the internet can influence individuals' judgments on health behav[132], promoting health behavior to some extent[133].

As shown in H2, Chinese youth's trait mindfulness has a positive impact on their intention of online psychological counseling. Numerous studies have proven that higher levels of mindfulness correlate to better physical health[47,68]. Mindfulness has a positive effect on health behaviors[134], with individuals of higher mindfulness levels more likely to adopt healthy behaviors than those with lower levels[134]. Increasing evidence also shows that mindfulness-based interventions are highly effective in reducing harmful health behaviors[135], promoting the implementation of healthy behaviors[136], and improving both physical and mental health[137–139]. Higher levels of mindfulness can aid in eliminating unhealthy behavioral habits and help promote healthy ones. Furthermore, enhancing one's mindfulness level through mindfulness training itself is a unique healthy behavior, which can hasten the replacement of unhealthy behavior habits[140]. This has been proven in areas such as AIDS prevention[141], smoking cessation[142], and weight loss[143].

As shown in H8 and H9, the public stigma and self-stigma for seeking professional psychological help among Chinese youth have a negative impact on their intention of online counseling. This is consistent with the research findings of Vogel et al.[144]. Numerous studies have proven that public stigma and self-stigma exert negative predictive effects[73,145] on psychological help-seeking. Individuals avoid counseling behaviors in order to avoid the negative emotions associated with stigma, which also suggests that help-seeking stigma is one of the barriers to individuals seeking counseling[146]. Thus, the higher the public and self-stigma for seeking professional psychological help, the lower the individual's intention to seek online psychological counseling.

Conclusions

Given China's emphasis on mental health and the rapid development of internet medical industry, online psychological counseling is showing a tremendous growth trend. Due to cultural factors, Chinese individuals demonstrate a higher resistance to psychological counseling compared to their Western counterparts. This research aims to examine the influence of information exposure, trait mindfulness, public stigma for seeking professional psychological help, and self-stigma for seeking professional psychological help on the intention to pursue online psychological counseling. By integrating the SOR theory and the mindful coping model to build a structural equation model, and through questionnaire surveys and model verification, it was found that an individual's information exposure and trait mindfulness positively affect their intention of counseling. Conversely, public stigma and self-stigma have a negative impact. Trait mindfulness has a negative impact on both public stigma and self-stigma. Information exposure only has a negative effect on self-stigma, and its impact on public stigma is not significant. Public stigma has a positive impact on self-stigma.

In terms of theoretical value, this research combines the SOR theory with the mindful coping model, introducing new concepts, providing a sample for the SOR theory explanation and predictive ability of behavior and the influence of trait mindfulness on individual psychology and behavior.

In practical terms, the research finds that the popularization of health information science and the enhancement of an individual's mindfulness level are beneficial for alleviating the stigma of psychological problems and subsequently promoting healthy behaviors. At the societal level, the focus of the Chinese government's mental health work should not merely concentrate on management and treatment, but also on the construction of social consensus. By means of objective, neutral, yet empathetic information dissemination and promotion, the

understanding of psychological health issues among the public can be enhanced, perceptions rectified, reducing negative labels such as stereotypes, thereby alleviating the stigma associated with psychological health issues and help-seeking behavior, promoting help-seeking behaviour such as online psychological counseling, and ultimately enhancing the psychological health level of citizens. At the individual level, individuals can consciously enhance their mindfulness level through methods such as meditation and mindfulness training. Actively cultivating a higher level of mindfulness can help individuals break free of habitual thinking, reduce negative emotions, and promote healthy behaviors[147–149], all of which are especially important for internet users[150].

Limitations and future research

This study of the emerging industry of online counseling still has limitations in terms of research questions, research methods, and research variables that need to be further explored in future research.

First, in terms of the refinement of the research question, this study did not make a standard division between online counseling and Internet information. Future studies could classify and research different counseling forms, such as voice counseling, video counseling, anonymous counseling, real-name counseling. To investigate the effects of different forms of counseling, and different levels of disclosure of personal information, on individuals' intentions to engage in counseling. Similarly, information exposure can be divided in terms of access to information, types of information topics, positive or negative information etc., to further distinguish the differences. Second, in terms of research methodology, the research is a cross-sectional study, and in the future, experimental methods, in-depth interviews, intervention methods and other methods can be used for longitudinal research to explore deeper internal mechanisms and understand dynamic changes and long-term effects. New technologies can also be introduced for multimodal data collection. Lastly, in terms of variable dimensions, numerous new variables presented by existing studies can affect individual online psychological counseling intention and actual counseling behavior, such as personality traits[151], convenience level[152], psychotherapist information presentation[153], etc. In future studies, variables can be selected from various perspectives, such as the social level, the doctor-patient level, and the clinical level, making the research perspective more multidimensional and comprehensive.

Data availability

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

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Conceptualization, Y.W. and T.Q.; methodology, T.Q.; software, T.Q.; validation, Y.W., T.Q. and C.L.; formal analysis, Y.W. and T.Q.; investigation, Y.W. and T.Q.; resources, Y.W. and C.L.; data curation, T.Q.; writing—original draft preparation, T.Q.; writing—review and editing, Y.W. and C.L.; visualization, C.L.; supervision, Y.W. and C.L.; project administration, Y.W.; funding acquisition, Y.W. All authors have reviewed and agreed to the published version of the manuscript."

Declarations

Competing interests

The authors declare no competing interests.

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