



Study on the effect of health science media platform on mental health of college students

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Abstract. Through a national survey, this study adopts the health belief model to examine the impact of health media exposure on the mental health of Chinese college students. Through the administration of questionnaires and subsequent data analysis involving 277 participants, it is discovered that health media exposure has a significant influence on the mental health of college students. Furthermore, the findings suggest that health beliefs serve as a mediating factor in this relationship.

Keywords: Mental health of college students, health communication, health media, health belief model

1 Introduction

Annually, a significant proportion of teenagers, ranging from 10% to 20%, encounter mental health challenges. Furthermore, mental health disorders contribute to around 16% of the overall burden of sickness and injury worldwide among individuals aged 10 to 19 (WHO, 2020).

The increasing development of health concepts has led to a growing recognition of mental health as an equally significant component of overall physical well-being. College students, being a youthful cohort, are susceptible to experiencing anxiety, depression, and other adverse feelings, as well as potentially developing mental disorders, when confronted with academic pressures, future-oriented decision-making, concerns about self-value, and other associated challenges. In the present setting, it is of significance to enhance mental health awareness among college students and improve their mental well-being.

Currently, the Internet and new media platforms have gained increasing significance as providers of information. Moreover, there has been a rise in the number of we-media accounts with medical expertise that engage in the dissemination of health knowledge through social platforms. This development has introduced novel channels and methods for health communication, thereby influencing the public's reception of information and subsequent behaviour.

This paper adopts the health belief model as the theoretical framework to investigate the interconnection among health media exposure, health beliefs, cognitive processes related to mental health, and mental health status. The aim is to comprehend the influence and transmission patterns of health communication on college students, and offer recommendations and resources for enhancing their mental well-being.

2 Literature review

2.1 Health communication

Around the 1990s, the academic community began to pay close attention to the field of health communication. Health communication was defined as the study of communication parameters applicable to health conditions or contexts, including levels, functions, and methods (Cassata, 1980).^[1] Later, another study, with a focus on communication analysis, defined the relationship between communication and health as the interaction between people in the health care process (Kreps and Thornton, 1992).^[2] Such a definition includes analysis at all levels of communication, but does not include a contextual focus on physical and mental health and interactions within the health service system (William et al., 1996).^[3]

Some scholars have also proposed a broader definition. Pettegrew (1982) believes that communication at any level and in any context, if the topic involves health issues, is health communication.^[4] He identified health communication as a subset of human communication; its main condition being that its subject matter is related to health problems. So far, the academic community has not reached a consensus on the definition of health communication, but they all agree that communication connects medical and health professional knowledge with the public and their health problems, and plays an important role in providing basic knowledge and help solve health problem.

Recently, as human beings enter the Internet age, emerging media tools also have an impact on the field of health communication. Mass communication has changed from one-way to two-way, and consumers have more abundant choices in the channels, content and time of information reception. Therefore, during this period, scholars in the field of health communication began to pay attention to: how to effectively use new technologies for communication; how effective the communication is; how to interact with users; whether to process information, etc. Today, interactive media platforms such as Twitter, Weibo, and WeChat, have gradually become the main channel for information dissemination, and the focus of research on health communication has also begun to shift to typical cases in new media. Scholars began to explore various communication phenomena in the process of combining the unique information distribution mechanism and interactive sharing mechanism of the Internet with health communication. At the same time, in the context of new media environment, the discrepancy of health information's effects on different groups of audiences and the media literacy of audiences have also begun to receive attention.

Compared with foreign countries, China's health communication research started later, and most of the early researchers were practitioners in the public health industry,

and academic researches were limited. At this stage, China's health communication research presents the characteristics of "health education" dominated by public health, and tends to be one-way education and publicity (Hu, 2012).^[5] In the 21st century, health communication research mainly focused on mass communication effect in the first ten years, and communication-oriented health communication research began to increase. However, according to CNKI database, the number of interdisciplinary research accounts for only 5.54% of the total research in this field, and there is still a huge gap in the integration and interdisciplinary development.

After 2010, the application of new media in health communication has become more and more predominant in China. Interdisciplinary research combining social media and data analysis has emerged in large numbers, and issues such as image building of communicators and dialogue between doctors and patients have gradually attracted attention. At this stage, China's health communication research is already in line with international standards, focusing on the media and effects of health communication. However, the current domestic research is still mainly based on content analysis, with limited methods and theoretical models. The research results are limited to the description and simple summary of the phenomenon, and the overall statement of the influencing factors and laws of health communication behavior is insufficient.

2.2 Health belief model

The health belief model (Rosenstock, 1974) has been one of the most generally recognized conceptual frameworks for studying people's health behavior. The model proposed that people need to meet the following three conditions to avoid negative health behaviors: they are very sensitive to diseases; the occurrence of diseases will have a serious impact on personal health; taking health actions will reduce the risk of diseases, which correspond to Perceived Susceptibility, Perceived Seriousness and Perceived Benefits respectively.^[6]

Later, M.Dodel and G.Mesch (2017) introduced Perceived Barriers, namely people's judgments on the obstacles in the process of adopting healthy behaviors; and Self-Efficacy, namely people's self-confidence in their ability to implement or give up a certain behavior; Cue to Action, namely whether people can take preventive measures.^[7]

Health belief model predicts when people regard bad health outcomes as real threats and perceive benefits of health behaviors outweigh perceived barriers, they are likely to engage in positive health actions. By assessing the various components of the health belief model and understanding the health beliefs of a specific group, it is possible to take more effective interventions and provide tailored health promotion messages (Pitts MJ et al., 2017).^[8]

The health belief model has been long-term used to explain health-related behaviors. A literature review reveals that in terms of the research context of the health belief model, the theme of disease began to appear in 1995; studies mainly focused on behaviors, attitudes, and types of diseases, and then turned to the perspective of prevention before 2009. Since 2016, it has gradually delve into chronic non-communicable dis-

eases. In terms of research hotspots, in addition to the health belief model and its internal structure, scholars pay special attention to women, mammography and nursing, and especially focus on adolescents and women's health (Liu et al., 2020).^[9]

Currently, domestic scholars' research on the health belief model is mostly concentrated in the medical field, focusing on medical and health policies, clinical medicine, preventive medicine, and cancer health management. From the perspective of journalism and communication, there are few studies focusing on health communication, and research focusing on the mental health of college students is even rarer.

2.3 Adolescent mental health and media use

Mental health is defined as a state of well-being in which everyone is aware of their potential, their ability to cope with daily stresses and their productivity (Larson, 1996).^[10] Among the factors affecting adolescents' mental health, media use has received increasing attention in recent years.

Research on adolescent mental health and media use has stated that adolescents are exposed to a large amount of information, browsing and searching for media contents in various forms, interacting and socializing, and sharing personal information, all of which will have a continuous and complex impact on their mental state (Naslund et al., 2020).^[11] Currently, researches on the impact of media use on students' mental health are multitudinous, mostly focusing on the negative impact of social media on their mental health, such as depression, anxiety, Internet addiction and sleep disorders (Obar and Wildman, 2015).^[12]

In terms of the mechanism of influence, some scholars believe that social media use may promote social comparison among adolescents, a behavior that can reduce an individual's subjective well-being, which in turn reduces his or her own life satisfaction, and ultimately has some negative impacts on his or her life (Mickles and Weare, 2020).^[13] However, media use has a concurrent positive contributory effect on mental health, and its value is particularly seen in reducing discrimination and prejudice, encouraging social networking, and reducing loneliness (Fergie, 2016).^[14]

A review of the literature on adolescent mental health and media use reveals several research gaps. First, the positive role and potential mechanism of media use in mental health promotion have not been widely emphasized (O'Reilly et al., 2019).^[15] Second, in China, the number of studies on mental health is relatively small, and most of them focus on rural middle-aged and elderly people, migrant workers, left-behind children and other groups, while the theoretical results for young people, especially college students, are limited. Third, there are even fewer studies delving in the impact of health media use on mental health. Health media can be subdivided into the following categories: (1) governmental official health media, (2) medical institutions or medical research websites, (3) social organizations and civil society organizations health media, (4) public health media, (5) traditional media health media, (6) enterprises' self-owned health media, (7) we-media platform (Li, 2018).^[16] Health media take advantage of different platforms and cater to the needs of the users to make the communication more efficient.

College students, being the predominant demographic of social media users, exhibit a higher propensity for accessing a wide range of informative content via the Internet. Concurrently, they actively engage in health social media interactions, hence fostering a heightened comprehension and assimilation of knowledge, which influencing their mental health. In this context, the study aims to show the influence and transmission patterns of mental health communication on college students through health media, and offer recommendations and resources for improving their mental well-being.

3 Method

3.1 Research framework and questions

Through the dissemination of social media, a positive influence of interconnection and interaction is established between specific media and college students, which is supposed to have a certain positive effect on setting college students' healthy psychology and alleviating mental problems. Starting from the perspective of communication science, this study takes 18-25-year-old undergraduates as the research object, and uses linear regression model to analyse the mechanism and effect of health content in the process of communication by studying the influence of the it of health science microblogs on the mental state and mental health recognition of undergraduates.

As shown in the Figure 1 below, through the review of existing academic results, we constructed a framework about the health media transmission process, in which the media exposure is the independent variable, including four factors of whether to pay attention, length of attention, frequency of attention, and length of a single browse; the two mediating variables set up are health beliefs (including four factors of perceived threats, perceived benefits, perceived barriers, and self-efficacy) and mental health recognition, the The dependent variable was the respondents' mental state.

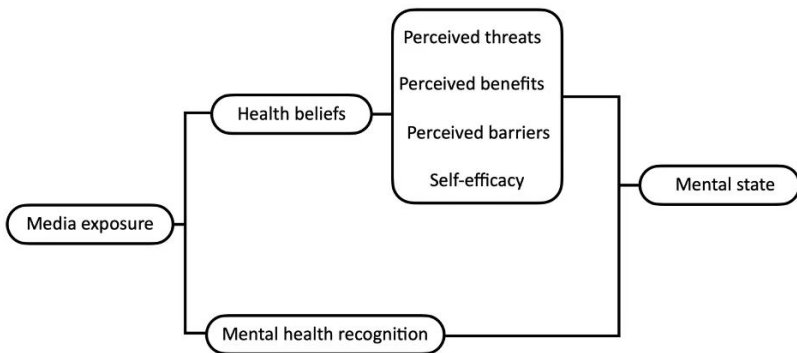


Fig. 1. Illustration of the framework about the health media transmission process.

Based on the findings of the review, we formulate the hypothesis:

H1: Healthy media exposure situations influence users' mental states;

H2: Health beliefs play a mediating effect in the process of media exposure situations influencing users' mental states;

H3: The level of mental health perceptions plays a mediating effect in the process of media exposure situations affecting users' mental states.

3.2 Research method

This paper mainly uses questionnaire survey method and quantitative analysis method to design the Questionnaire on Media Exposure and Mental Health of College Students around the research question, and uses linear regression model to analyse the obtained data.

3.3 Questionnaire design

This questionnaire will be divided into four parts based on the factors influencing the health belief model. The first part is demographic factors, including filling in the user's age, gender, profession, and income. The second part is the knowledge structure factor, which mainly measures the knowledge of the study participants about mental health as well as mental illness and other related information through Richter's 5-point scale. Values were assigned through a scale of 1-5, with higher scores representing a higher level of user knowledge about mental health. The third component is the psychosocial factor, i.e., the exposure of the study participants to the relevant media, including the frequency of browsing, browsing time, interaction frequency and topics of interest of the health information. The fourth part was the level of health beliefs, including four dimensions of perceived threats, perceived benefits, perceived barriers, and self-efficacy, also using a 5-point Richter scale.

A total of 277 valid questionnaires were obtained from this questionnaire collection and the obtained data were analysed using SPSS.

4 Data Analysis

4.1 Demographic sample analysis

According to the Table 1 below, the total number of respondents was 277, all of whom were university students, of whom 138 were female, accounting for 49.8%, and 139 were male, accounting for 50.2%, with a balanced ratio of men to women.

In terms of education, the majority of respondents are undergraduates, accounting for 94.2%, while specialists, postgraduates and doctoral students account for 1.8%, 3.6% and 0.4% respectively. The proportion of respondents with a liberal arts degree was 59.6%, which means that there were more students majoring in liberal arts in the survey. 96% of the students were enrolled in non-medical related majors, which means that the sample of the present study was still dominated by general college students.

In terms of regional distribution, the number of students in the East, Central and West regions accounted for 34.7%, 36.5% and 28.9% respectively, basically maintaining the ratio of 1:1:1 in each region, with an even geographical distribution of the survey respondents.

In terms of family income, the average monthly per capita income of the respondents' families spans a wide range, from 1,000 yuan to more than 10,000 yuan, and the distribution is relatively even, indicating that this study basically includes samples of all income levels.

Table 1. Sociodemographic characteristics of participants

| | <i>n</i> | % |
|---------------------------|----------|------|
| Gender | | |
| Female | 138 | 50.2 |
| Male | 139 | 49.8 |
| Highest educational level | | |
| High school | 5 | 1.8 |
| Undergraduates | 261 | 94.2 |
| Postgraduates | 10 | 3.6 |
| Doctoral students | 1 | 0.4 |
| University area | | |
| West | 80 | 28.9 |
| Middle | 101 | 36.5 |
| East | 96 | 34.7 |
| Family income | | |
| 1000-3000 | 32 | 11.6 |
| 3001-5000 | 53 | 19.1 |
| 5001-8000 | 69 | 24.9 |
| 8001-10000 | 45 | 16.2 |
| >10001 | 78 | 28.2 |
| Medical related major | | |
| Yes | 11 | 4 |
| No | 266 | 96 |

4.2 Linear regression analysis: effects of health media exposure on mental state and mediator variable correlation test

To measure the mental health level of college students, we used the General Health Questionnaire (GHQ). This questionnaire, originally developed by Goldberg and later revised by Dr Li Hong and others at the Institute of Education, Tsinghua University, contains three subscales: GHQ-Self-Affirmation, GHQ-Melancholy Scale, and GHQ-Anxiety Scale. Higher scores on the Depression Scale and Anxiety Scale indicate greater depression and anxiety, and higher scores on the Self-Affirmation Subscale indicate greater self-affirmation. We quantified the respondents' media exposure and

mental state by dimensionally combining the four factors of media exposure and the seven factors of mental state.

Table 2. Regressions of media usage, health belief and mental health recognition on Mental State

| | <i>B</i> | <i>SE</i> | β | <i>t</i> | <i>p</i> | R-Squared | Adjusted R-Squared |
|---------------------------|----------|-----------|---------|----------|----------|-----------|--------------------|
| Media usage | -0.176 | 0.08 | -0.131 | -2.192 | 0.029* | 0.017 | 0.014 |
| Health belief | 0.753 | 0.188 | 0.375 | 3.998 | 0.000** | 0.14 | 0.131 |
| Mental health recognition | 0.929 | 0.259 | 0.212 | 3.593 | 0.000** | 0.045 | 0.041 |

SE: standard error.

p*<.05; *p*<.01; ****p*<.001.

The linear regression analysis shows that the model formula is: dependent variable mental health state = 25.069-0.176* independent variable media exposure, and the model R-squared value is 0.017, which means that the independent variable explains 1.7 per cent of the cause of change in the dependent variable. The F-test of the model found that the model passes the F-test (F=4.807, *p*=0.029<0.05), which means that the independent variable must have an influence relationship on the dependent variable, and the value of the regression coefficient of the independent variable is -0.176 (*t*=-2.192, *p*=0.029<0.05), which means that the independent variable can have a significant negative influence relationship on the dependent variable, i.e., the college student The more exposure to health media, the worse their mental state.

Then we tested the correlation between the two mediating variables and the dependent variable. Firstly, linear regression analyses were also conducted on health beliefs and mental health recognition, and according to Rosenstock's health belief model, we classified health beliefs into four factors: perceived threats, perceived benefits, perceived barriers, and self-efficacy, while mental health recognition referred to the "Essentials of Core Information and Knowledge for Mental Health Publicity and Education" issued by the former General Office of the Ministry of Health (Weiwei Office of Disease Control and Disorders Issued [2017]) No. 84) and Li Hongqiu, Cui Hongliang and other scholars' Survey on Mental Health Knowledge of Residents in a Community in Beijing and Mental Health Promotion, eight judgement questions were selected, and the higher the respondents' scores, the better the level of mental health recognition.

As can be seen from Table 2, health beliefs as the independent variable and mental state as the dependent variable were analysed by linear regression, and as can be seen from the above table, the model formula is: Y (mental state) = 12.331 + 0.753*M1-health beliefs, and the model R-squared value is 0.140, which means that M1-health beliefs can explain the reason for 14.0% of the change in Y (mental state). The F-test of the model found that the model passed the F-test (F=15.988, *p*=0.000<0.05), which means that the M1-health beliefs must have an influential relationship on Y (mental state), and the final specific analysis shows that the regression coefficient value of M1-health beliefs is 0.753 (*t*=3.998, *p*=0.000<0.01), which means that the M1-health beliefs will have a significant positive influence relationship on Y (mental state).

Similarly, Y (mental state) = $3.716 + 1.377 * M2$ -Mental Cognition, the model R-squared value is 0.087 , $F=9.304$, $p=0.003 < 0.05$, and the value of regression coefficient of M2-Mental Cognition is 1.377 ($t=3.050$, $p=0.003 < 0.01$), implying that M2- Mental Recognition will have a significant positive influence on Y (mental state). positive influence relationship. Both mediating variables passed the correlation test.

Table 3. Regressions of media usage on health belief.

| | <i>B</i> | <i>SE</i> | β | <i>t</i> | <i>p</i> | R-Squared | Adjusted R-Squared |
|-------------|----------|-----------|---------|----------|----------|-----------|--------------------|
| Media usage | 0.108 | 0.041 | 0.156 | 2.615 | 0.009** | 0.024 | 0.021 |

SE: standard error.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 4. Regressions of media usage on mental health recognition.

| | <i>B</i> | <i>SE</i> | β | <i>t</i> | <i>p</i> | R-Squared | Adjusted R-Squared |
|-------------|----------|-----------|---------|----------|----------|-----------|--------------------|
| Media usage | 0.067 | 0.018 | 0.218 | 3.71 | 0.000** | 0.048 | 0.044 |

SE: standard error.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Secondly, we tested the correlation between the two mediator variables and the independent variables, as shown in Tables 3 and 4, the R-square values of the two mediator variables on the independent variable media exposure are 0.024 and 0.048 , respectively, and they both passed the F-tests (F-values of 6.838 and 13.767 , respectively), and the regression coefficients are 0.108 and 0.067 , which proves that the media exposure is significantly positively correlated with both the health beliefs and the mental health recognition. have significant positive correlation.

4.3 Mediator variable tests: the masking effect of mediator variables

Table 5. Health belief as mediator of the relation between media usage and mental health.

| | <i>c</i> | <i>a</i> | <i>b</i> | <i>a*b</i> | <i>c'</i> | effect size |
|---------------|-------------|----------|----------|------------|--------------|-------------|
| Health belief | - 0.176* | 0.108** | 0.609** | 0.066 | - 0.242** | 27.15% |

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 6. Mental health recognition as mediator of the relation between media usage and mental health.

| | <i>c</i> | <i>a</i> | <i>b</i> | <i>a*b</i> | <i>c'</i> | effect size |
|---------------------------|----------|----------|----------|------------|-----------|-------------|
| Mental health recognition | 0.176* | 0.067** | 1.108** | 0.074 | -0.251 | 29.60% |

p*<.05; *p*<.01; ****p*<.001.

Through the regression model construction of the mediating effect, it can be seen from Table 5 that Y (mental state) = $25.069 - 0.176 * X$ (media exposure). M1-health beliefs = $14.586 + 0.108 * X$ (media exposure), Y (mental state) = $16.185 - 0.242 * X$ (media exposure) + $0.609 * M1$ -health beliefs, *a* and *b* are significant, and *c'* is significant, and *a*b* and *c'* are heteroscedastic, health beliefs as a mediator variable play a masking role in the process of media exposure situations affecting the mental state of college students, and the masking effect accounts for 27.15 per cent of the total; similarly, from Table 6, Y (mental state) = $25.069 - 0.176 * X$ (media exposure), M2- Mental Health Recognition = $14.280 + 0.067 * X$ (media exposure), Y (Mental State) = $9.250 - 0.251 * X$ (media exposure) + $1.108 * M2$ - Mental Health Recognition, *a*, *b* significant, *c'* significant and heteroscedastic with *a*b*, indicating that Mental Health Recognition plays the role of a masking and the percentage of masking effect is 29.60%.

5 Conclusion

5.1 Conclusion Summary

Based on data analysis, the conclusion is drawn as below:

H1: Healthy media exposure influence audience mental states; the hypothesis is valid. Exposure to health media has a significant negative impact on the mental state of college students.

H2: Health beliefs play a mediating effect in the process of media exposure situations influencing audiences' mental states; the hypothesis is valid. Health beliefs play a mediating effect, reducing the negative impact of independent variables on dependent variables.

H3: The level of mental health perceptions plays a mediating effect in the process of media exposure situations affecting audiences' mental states; the hypothesis is valid. Mental health recognition level plays a mediating effect in the transmission process, reducing the negative impact of independent variables on dependent variables.

5.2 Explanation

Firstly, Health media exposure negatively affects college students' mental status. With regard to health media exposure, only relevant indicators such as the time and frequency of using social media were examined in the questionnaire. However, on the internet, information regarding mental health may come from a variety of sources. Some may from professional institutions or content from unidentified sources. College students

who are exposed to this kind of difficult material may develop a distrustful and anxious attitude, which biases the way mental health is measured. On the other hand, college students are generally under a certain amount of mental stress, and are prone to negative emotions in balancing their studies, future plans, and interpersonal relationships. As a result, they may browse websites that are related to mental health more frequently. For example, some of them are for emotional venting, while others are used for scientific emotion management and problem-solving, all of which may be contributing factors to the lengthening of media exposure.

Secondly, Health beliefs reduce the negative impact of media exposure on college students' mental health. Perceived seriousness refers to the perception of the susceptibility and severity of mental illness. According to the survey results, the majority of respondents believe that mental illness has an impact on their health. Perceived benefits, on the other hand, are that actively preventing mental disorders can benefit oneself and effectively assure a healthy mental state, and the majority of them have high self-efficacy and are prepared to take appropriate activities. It can be observed that developing health beliefs enables college students to accept complex health information on social media in a more scientific and rational manner, to favorably modify their mental state, and to be more proactive, self-assured, and scientific in preventing mental disease.

Thirdly, Mental health recognition reduces the negative impact of media exposure on the mental health status of college students. Mental health cognitive level refers to whether or not one has a certain level of scientific knowledge about mental health-related general knowledge. Individuals who lack fundamental knowledge about mental health are more likely to be perplexed by sophisticated content on social media and make incorrect assessments of their own mental status, which can have severe consequences and exacerbate negative feelings. A high level of mental health recognition allows individuals to maintain a correct assessment of health information and rationally apply it to regulate their own mental state, thereby helping to reduce the problems caused by inappropriate intake of health media information and reducing the negative correlation with mental health status.

Through this study, we found that the health media, a media platform that is supposed to popularize health knowledge and care for the mental health of college students, has instead had a negative impact on their mental health, but a better level of health recognition and health beliefs can mitigate the transmission of this negative impact. Based on this, we will discuss how the health media can best serve its purpose.

Firstly, health media must increase the professionalism of their communication material. In terms of health media content, the proportion of scientific pieces on mental health is generally low, and the majority of them are focused on knowledge popularization. Some posts on Microblog, written by so-called professional doctors with a huge following, primarily introduce the usual manifestations of depression, with titles such as "Concern about mental health, how far are you from depression?" The headline of the content generally includes appealing terms, while the body content is more homogenized, with no apparent source of information. Due to the sensitivity of mental health issues, users' assessments of their own mental states will be impacted by the lack of competent medical advice, which will have a negative impact on the desired outcome of preventative behavior. Therefore, instead of disseminating the tone of commercial

news and abandoning the flow-first reporting guidelines, relevant health science media should pay more attention to the scientific and professional nature of the report during the content production process.

Secondly, there is a need to improve the fit between the media coverage and the users' needs. Health beliefs serve as another mediating variable that influences user behavior. When communicating, the health media should focus more on the degree of reception and the users' information needs. To logically create media content and ensure that it plays a beneficial role in encouraging the creation of health beliefs, it is important to actively analyze the audience's needs, preferences, and concerns as well as their attitudes and behaviors toward the content. At present, some reports still contain sensitive words such as "suicide, depression, danger", which can easily lead the users' emotions to a more extreme direction, contrary to the purpose of conducting healthy beliefs.

Finally, it is necessary to build an all-channel communication system. Science content that promotes healthy, scientific, and positive mental health is directly tied to college students' mental health and has an impact on their cognition and thinking. At present, most of the health science popularization media are centered on various disease topics to carry out popularization, mainly on Microblog and WeChat, the linkage between the various platforms is relatively weak. In the process of health dissemination, health media accounts can be modeled after the type of some bloggers, to carry out the interconnection and interaction of multiple platforms to create a full range of products. At the same time, the development of distinctive content, adaptable forms of communication, and increased communication efficiency are all necessary in order to increase the impact of the dissemination of mental health information.

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