

Response to Reviewer 1 Comments

Point 1: When discussing the risk factors of anxiety in college students, the article lists many factors. Although it covered all the ground, none of them were discussed in depth. In addition, the data collection is global, so it is fragmented. It would be more valuable if the author could do some research himself and draw conclusions from it.

Response 1: Thank you for your kind comments. The paper is a narrative review of extensive studies including the risk factors and digital interventions for anxiety disorders in college students. Given that it involves a broad range of topics, we did not undertake explicit methods such as systematic reviews, although we took advantage of some systematic reviews. Regarding the reviewer's comment that data collection is global, so it is fragmented, we have fully considered the reviewer's comments. On the premise of covering the risk factors for college students' anxiety as extensively as possible, we have summarized and discussed the risk factors and digital interventions for stakeholder groups in more depth and added this section to the paper.

The "DISCUSSION" section was added to the text as follows.

This review found that current research on the influencing factors of college student anxiety is relatively limited and lacks a comprehensive analysis. For example, most studies have separately explored the impact of the COVID-19 pandemic, family functioning, sleep, diet, drinking, and other factors on college student anxiety^[36,37,52,66]. Therefore, this study takes the perspective of different stakeholders and reasonably divides various influencing factors, which facilitates clearer and more in-depth discussion. After reviewing and summarizing the literature, it can be found that heterogeneity at the individual level is a more important factor that triggers college student anxiety, mainly manifested in biological factors, lifestyles, and personalities. Previous research has comprehensively and sufficiently demonstrated the influence and mechanisms of physiological and behavioral factors on college student anxiety. It is worth noting that individual psychological characteristics may be the potential motivation for manifest behavior, which can also have a direct or indirect impact on college student anxiety. Future research should include individual psychological characteristics in the scope of study. Individuals inevitably show heterogeneity under the influence of the external environment, and family and school are key external factors that influence college student anxiety. Currently, research on families mainly focuses on parenting styles, family relationships, and family functioning. In fact, the impact of families on college student anxiety largely depends on the quality of the family environment and relationships. This impact is also more far-reaching. Previous research has also confirmed this point. Considering the special influence of families, future research can consider using qualitative research methods based on diverse samples to explore the deeper mechanisms behind this influence.

Colleges are the direct environment for college students' learning and living. Previous research has paid more attention to the influence of peer relationships in colleges on college student anxiety, especially malignant peer relationships^[49,50]. However, other interpersonal relationships, campus environment, and support provided by colleges should not be ignored. Future research should pay attention to other risk factors within colleges to enrich and deepen research in this field. As background factors, the national and social environment have an impact on college student anxiety. Previous research has thoroughly demonstrated the state of college student anxiety and its causes during the COVID-19 pandemic, providing an important reference for seeking coping strategies^[18,37]. The overall economic development and employment environment may be included in future research as supplementary background factors.

In terms of interventions for college student anxiety, in addition to traditional cognitive behavioral therapy and mindfulness interventions, digital mental health has become a new trend in recent years. Its characteristics of scalability and unique advantages of high cost-effectiveness and sustainability have attracted much attention. Currently, research combines traditional intervention methods with digital interventions to analyze their effectiveness in relieving college student anxiety and introduces mobile applications, chatbots, and virtual reality tools in interventions to demonstrate the implementation process and effectiveness. However, these intervention methods are often developed by individuals or teams, which limits their scope and effectiveness. Therefore, the complete digital intervention process, including development, implementation, supervision, evaluation and feedback, and assistance, requires the participation of different stakeholders. At the national and social levels, only a few studies currently focus on policy protection, funding, and regulation, but there are differences in the attitudes of different countries toward digital interventions, as well as the policy measures and regulatory standards adopted^[110,111]. There is a need for further research and exploration on how to ensure the security, effectiveness, and sustainability of digital interventions at the national level. At the school level, there is currently a lack of research on the application of digital intervention projects in college campuses and the efforts that schools, as stakeholders, should make. Schools, as important entities for addressing students' mental health issues and promoting the physical and mental health development of students, need to take appropriate measures to make full use of digital interventions, such as establishing digital intervention service policies and seeking appropriate intervention models. At the family level, existing research ignores the importance of families in digital mental health interventions for college students. In fact, parents may be more likely to notice abnormal mental states in college students. Therefore, it is possible to consider integrating the role of families into specific digital intervention projects, plans, or applications in the future. At the individual level of college students, as the direct subjects of digital intervention, future research should focus on the specific demands and feedback of college students and enhance their proactive seeking of mental health assistance and participation in digital interventions. In summary, how various stakeholders can play a full role in digital interventions and form multifaceted

interactive interventions is the main direction of future research.

References:

18. Guan J, Wu C, Wei D, Xu Q, Wang J, Lin H, Wang C, Mao Z. Prevalence and Factors for Anxiety during the COVID-19 Pandemic among College Students in China. *Int J Environ Res Public Health* 2021; 18 [PMID: 34067045 DOI: 10.3390/ijerph18094974]

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Response to Reviewer 2 Comments

Point 1: Include a section where the objectives of the work are explained, what type of review is being carried out and how the bibliographic search has been carried out, in which databases and with what criteria.

Response 1: Thank you for your thoughtful suggestion. Although this paper is a narrative review of extensive studies including the risk factors and digital interventions for anxiety disorders in college students, we have added a section on study objectives and literature search strategies to make the review more scientifically rigorous. In this section, we clarified the purpose of the study, literature sources, search methods, and selection criteria.

The additions are as follows.

Therefore, college student anxiety is not caused by a single factor, and it cannot be effectively intervened by a single force. It needs to be studied from the perspective of different stakeholders. However, there are few literature reviews on this topic, and most studies analyze individual risk factors and intervention methods, failing to grasp the trend of digital mental health intervention development. The purpose of this literature review is to review and discuss the main literature on college student anxiety and analyze the risk factors and new digital intervention methods for college student anxiety from the perspective of four different stakeholders: the state, the school, the family, and the individual. The aim is to provide a reference for effective intervention and reduction of anxiety in this group.

The literature search was conducted in November 2022. PubMed, Web of Science Core Collection, and Scopus databases were searched using the keywords "anxiety disorders in college (university) students", "anxiety disorders" and "college (university) students" and "prevention", and "digital mental health interventions". After eliminating duplicates, the literature was screened based on the title, abstract, and keywords, with the exclusion criteria being (1) studies on groups other than college students; (2) titles that did not appear in the search terms but were only briefly mentioned in the abstract, with low overall relevance; (3) other mental health issues unrelated to anxiety; (4) articles without full-text access; (5) gray literature; and (6) articles not written in English. The detailed process of literature screening is shown in Figure 1.

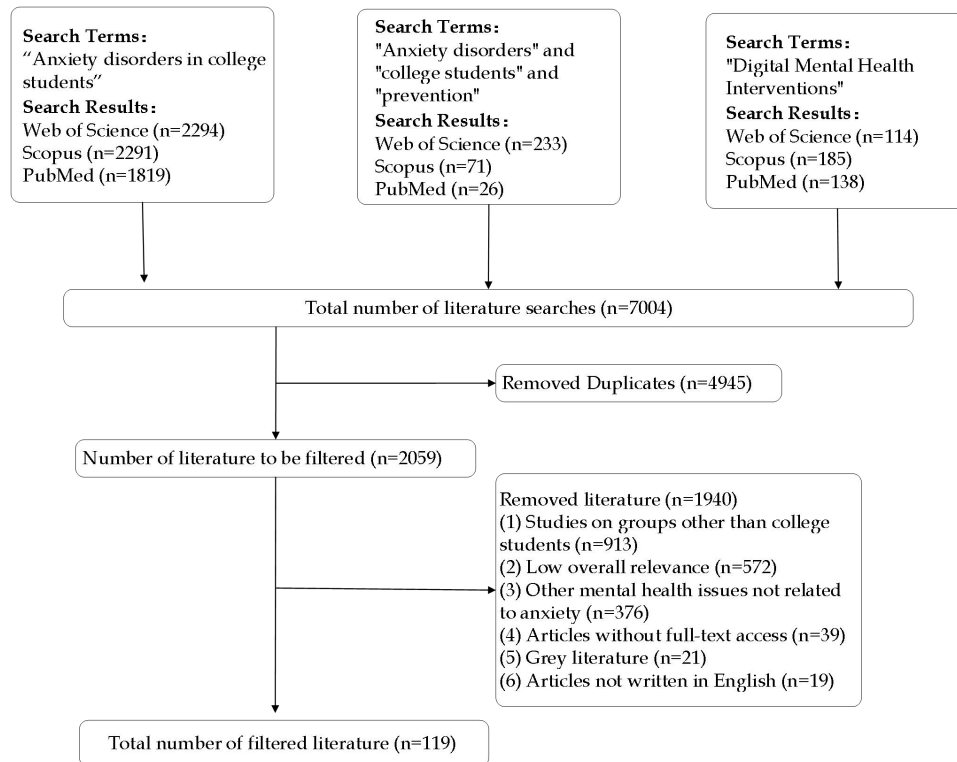


Figure 1: Literature search strategy

Point 2: Include a discussion section in which the results are discussed, the current lines of work and where the next advances in this area are directed. The collected work should be structured.

Response 2: We have fully considered the reviewer's comments. On the premise of covering the risk factors for college students' anxiety as extensively as possible, we have summarized and discussed the risk factors and digital interventions for stakeholder groups in more depth and added this section to the paper.

The "DISCUSSION" section was added to the text as follows.

This review found that current research on the influencing factors of college student anxiety is relatively limited and lacks a comprehensive analysis. For example, most studies have separately explored the impact of the COVID-19 pandemic, family functioning, sleep, diet, drinking, and other factors on college student anxiety^[36,37,52,66]. Therefore, this study takes the perspective of different stakeholders and reasonably divides various influencing factors, which facilitates clearer and more in-depth discussion. After reviewing and summarizing the literature, it can be found that heterogeneity at the individual level is a more important factor that triggers college student anxiety, mainly manifested in biological factors, lifestyles, and personalities. Previous research has comprehensively and sufficiently demonstrated the influence and mechanisms of physiological and behavioral factors on college

student anxiety. It is worth noting that individual psychological characteristics may be the potential motivation for manifest behavior, which can also have a direct or indirect impact on college student anxiety. Future research should include individual psychological characteristics in the scope of study. Individuals inevitably show heterogeneity under the influence of the external environment, and family and school are key external factors that influence college student anxiety. Currently, research on families mainly focuses on parenting styles, family relationships, and family functioning. In fact, the impact of families on college student anxiety largely depends on the quality of the family environment and relationships. This impact is also more far-reaching. Previous research has also confirmed this point. Considering the special influence of families, future research can consider using qualitative research methods based on diverse samples to explore the deeper mechanisms behind this influence. Colleges are the direct environment for college students' learning and living. Previous research has paid more attention to the influence of peer relationships in colleges on college student anxiety, especially malignant peer relationships^[49,50]. However, other interpersonal relationships, campus environment, and support provided by colleges should not be ignored. Future research should pay attention to other risk factors within colleges to enrich and deepen research in this field. As background factors, the national and social environment have an impact on college student anxiety. Previous research has thoroughly demonstrated the state of college student anxiety and its causes during the COVID-19 pandemic, providing an important reference for seeking coping strategies^[18,37]. The overall economic development and employment environment may be included in future research as supplementary background factors.

In terms of interventions for college student anxiety, in addition to traditional cognitive behavioral therapy and mindfulness interventions, digital mental health has become a new trend in recent years. Its characteristics of scalability and unique advantages of high cost-effectiveness and sustainability have attracted much attention. Currently, research combines traditional intervention methods with digital interventions to analyze their effectiveness in relieving college student anxiety and introduces mobile applications, chatbots, and virtual reality tools in interventions to demonstrate the implementation process and effectiveness. However, these intervention methods are often developed by individuals or teams, which limits their scope and effectiveness. Therefore, the complete digital intervention process, including development, implementation, supervision, evaluation and feedback, and assistance, requires the participation of different stakeholders. At the national and social levels, only a few studies currently focus on policy protection, funding, and regulation, but there are differences in the attitudes of different countries toward digital interventions, as well as the policy measures and regulatory standards adopted^[110,111]. There is a need for further research and exploration on how to ensure the security, effectiveness, and sustainability of digital interventions at the national level. At the school level, there is currently a lack of research on the application of digital intervention projects in college campuses and the efforts that schools, as stakeholders, should make. Schools, as important entities for addressing students' mental health issues and promoting the

physical and mental health development of students, need to take appropriate measures to make full use of digital interventions, such as establishing digital intervention service policies and seeking appropriate intervention models. At the family level, existing research ignores the importance of families in digital mental health interventions for college students. In fact, parents may be more likely to notice abnormal mental states in college students. Therefore, it is possible to consider integrating the role of families into specific digital intervention projects, plans, or applications in the future. At the individual level of college students, as the direct subjects of digital intervention, future research should focus on the specific demands and feedback of college students and enhance their proactive seeking of mental health assistance and participation in digital interventions. In summary, how various stakeholders can play a full role in digital interventions and form multifaceted interactive interventions is the main direction of future research.

References:

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Point 3: Include a section of conclusions summarizing the scientific contribution and lines of future work.

Response 3: We appreciate your kind suggestion. We have added a summary of the scientific contribution and lines of future work in the conclusion section as suggested by the reviewer.

The additions are as follows.

Numerous studies have been conducted on the status, influencing factors, prevention, and intervention methods for anxiety disorders among college students worldwide, with significant findings. This literature review refines and summarizes the influencing factors and digital interventions for anxiety disorders among college students from the perspective of stakeholders, emphasizing the important roles played by different stakeholder groups, and provides valuable references for improving the mental health of college students. We believe that digital intervention, as an effective solution for mental health issues, has strong appeal and potential for development. Future research should focus on the development and application of digital mental health interventions. First, artificial intelligence and big data-based intervention methods for anxiety disorders should be implemented and enriched, with large-scale data collected and precise diagnosis achieved. Using algorithms that predict college students' anxiety levels based on various factors can enable diagnosis in natural states and reduce college students' fear of doctors. Second, because the causes, symptom expressions, and severity of anxiety disorders vary among college students, future research should consider the personalized mental health needs of students. As some researchers have pointed out, the goal of digital representation of college students is not only to understand the reasons for students' mental health problems but also to provide personalized care^[118]. Based on the evaluation data regularly collected from patients and healthcare providers, stakeholders can develop decision trees and machine algorithms to formulate personalized treatment plans and improve the flexibility of treatment^[22]. Third, future adjustments can be made from the development end of the application, slightly weakening college students' awareness that they are "receiving psychological treatment," protecting their privacy, and reducing the risk of stigmatization.

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Response to Reviewer 3 Comments

General Comments:

This article summarizes the risk factors of college students' anxiety disorder and relevant literature on digital intervention, summarizes the influencing factors including national and social levels, university level, family level and personal level, and also puts forward some digital intervention suggestions for these four levels. This is of great value for mental health of college students and sustained development of society.

Point 1: In title "university students" was used, while in other parts, "college students" was mainly used, and other phrases pairs can also be found here and there, it is suggested for authors to check whole text for consistence. At the family level of the influencing factors in the text, the author mentioned the impact on "children" in many places. Children and college students are two groups, and the relationship between them seems not to be clearly explained and discussed?

Response 1: We are grateful for your constructive suggestion, and we have polished the language of the manuscript. After the revision, we tried to keep the language as consistent as possible throughout the text to reduce misunderstandings among readers. For example, we have changed all references to "university students" to "college students". It should be noted that children are used in the special context of "family".

Point 2: The difference between "anxiety symptoms" and "anxiety disorder" should be clearly stated and discussed as they are key contents of the topic.

Response 2: Thank you for your kind suggestion. We have further revised the language to reduce ambiguity, to distinguish between "anxiety symptoms" and "anxiety disorder".

Point 3: Interventions at the national and social levels, the university level, the family level, and the individual level can also be interconnected. For example, society can affect families and schools, and schools can affect families and individuals. Is the effect of this multi angle interaction intervention better?

Response 3: Thank you for your helpful advice. We have fully considered the correlation of the different levels, summarized and discussed in more depth the risk factors and digital interventions for stakeholder groups, and added this to the paper.

The "DISCUSSION" section was added to the text as follows.

This review found that current research on the influencing factors of college student anxiety is relatively limited and lacks a comprehensive analysis. For example, most studies have separately explored the impact of the COVID-19 pandemic, family functioning, sleep, diet, drinking, and other factors on college student anxiety^[36,37,52,66]. Therefore, this study takes the perspective of different stakeholders and reasonably divides various influencing factors, which facilitates clearer and more in-depth discussion. After reviewing and summarizing the literature, it can be found that heterogeneity at the individual level is a more important factor that triggers college student anxiety, mainly manifested in biological factors, lifestyles, and personalities. Previous research has comprehensively and sufficiently demonstrated the influence and mechanisms of physiological and behavioral factors on college student anxiety. It is worth noting that individual psychological characteristics may be the potential motivation for manifest behavior, which can also have a direct or indirect impact on college student anxiety. Future research should include individual psychological characteristics in the scope of study. Individuals inevitably show heterogeneity under the influence of the external environment, and family and school are key external factors that influence college student anxiety. Currently, research on families mainly focuses on parenting styles, family relationships, and family functioning. In fact, the impact of families on college student anxiety largely depends on the quality of the family environment and relationships. This impact is also more far-reaching. Previous research has also confirmed this point. Considering the special influence of families, future research can consider using qualitative research methods based on diverse samples to explore the deeper mechanisms behind this influence. Colleges are the direct environment for college students' learning and living. Previous research has paid more attention to the influence of peer relationships in colleges on college student anxiety, especially malignant peer relationships^[49,50]. However, other interpersonal relationships, campus environment, and support provided by colleges should not be ignored. Future research should pay attention to other risk factors within colleges to enrich and deepen research in this field. As background factors, the national and social environment have an impact on college student anxiety. Previous research has thoroughly demonstrated the state of college student anxiety and its causes during the COVID-19 pandemic, providing an important reference for seeking coping strategies^[18,37]. The overall economic development and employment environment may be included in future research as supplementary background factors.

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Point 4: What does "National and society" after the Table 2?

Response 4: Thank you for pointing out this error, which has been revised to "Country and society".

Point 5: As stated in "Limitations" section, this article analyzes the relevant literature written in English while excluding studies written in other languages. China has the most college students in the world, literatures in Chinese, at least some important ones, are suggested be included to review.

Response 5: Thank you for the constructive advice. The English literature we reviewed included Chinese college students, and we searched the Chinese literature to cover anxiety risk factors and digital interventions for all college students as comprehensively as possible.

Point 6:

Though a Non-Native Speakers of English Editing Certificate was submitted with the manuscript, the English writing may need further polishing, there

are still many sentences that have doubts about the standard expression or may have some ambiguity. Such as (maybe not limited as listed):

In Asia, a cross-sectional study of 617 college students in India showed that the prevalence of anxiety disorders was 30% higher than the prevalence of depression, which was 18%.

College students are busy with schoolwork, exams and various activities, and their time is relatively divided.

First, digital mental health interventions do not rely on professional psychologists, which can effectively alleviate the imbalance between the supply and demand for mental health professionals.

The Mana Maali Digital Anxiety Program is an online support system specifically developed to provide support throughout the day to college students experiencing mild to moderate psychological distress.

There are mobile applications such as DeStressfy that are mindfulness-based applications designed to provide practice questions in the form of audio, video, or text files. The topics include four parts: basic visualization, gratitude, imagining the life you want, and finding meaning.(the second sentence not clear for its relation with the former one)

Digital interventions are more likely to benefit college students' mental health development when all stakeholders that are affected by digital interventions form a synergy.

Determining the best means of ensuring the safety, effectiveness, and sustainability of digital interventions at the national level still requires further research and exploration.

Schools are an important topic in considering how to solve students' psychological problems and promote their physical and mental health, and corresponding measures need to be taken, such as establishing a digital intervention service policy and seeking appropriate intervention models, to make full use of digital interventions.

Students have more mental health needs and are the primary stakeholders in digital interventions.

Students should actively participate in and cooperate with the relevant exercises in the process of receiving the intervention and report any problems encountered to an instructor or doctor in a timely manner.

Response 6: Thank you for your helpful advice. We used the Premium Translation service offered by American Journal Experts (AJE) to modify the revised version of the paper to ensure that all grammatical, syntactical, formatting, and other related errors are resolved so that the revised manuscript will meet your requirements (Grade A). AJE is the professional English language editing company that Baishideng Publishing Group Inc. recommends.



Editing Certificate

This document certifies that the manuscript

**Risk factors and digital interventions for anxiety disorders in college students:
stakeholder perspectives**

prepared by the authors

Xin-Qiao Liu, Yu-Xin Guo, Yi Xu

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Response to Company Editor-in-Chief Comments

General Comments:

I have reviewed the Peer-Review Report, full text of the manuscript, and the relevant ethics documents, all of which have met the basic publishing requirements of the World Journal of Psychiatry, and the manuscript is conditionally accepted.

Point 1: Before final acceptance, when revising the manuscript, the author must supplement and improve the highlights of the latest cutting-edge research results, thereby further improving the content of the manuscript. To this end, authors are advised to apply a new tool, the RCA. RCA is an artificial intelligence technology-based open multidisciplinary citation analysis database. In it, upon obtaining search results from the keywords entered by the author, "Impact Index Per Article" under "Ranked by" should be selected to find the latest highlight articles, which can then be used to further improve an article under preparation/peer-review/revision. Please visit our RCA database for more information at: <https://www.referencecitationanalysis.com/>.

Response 1: Thank you for your careful reading. To further improve the content, we have added and refined the highlights of the latest cutting-edge research findings in the paper. We are grateful for your kind comments. RCA is indeed a useful tool for literature analysis, and we found it helpful in the revision of our manuscript.