



A Survey of the Current Status of Artificial Intelligence Counseling to Alleviate Psychological Anxiety among Medical Interns

Wanying Hu, Xinqun Bao, Huijing Luo, Xinyi Xu, Xiaoling Ou, Qiheng Huang*

Faculty of Chinese Medicine Science, Guangxi University of Chinese Medicine, Nanning, China

*The corresponding author's email address:
774661672@qq.com

Abstract. Objective: The objective of this study is to analyze the efficacy of AI-based psychological counseling in alleviating the psychological anxiety of medical interns. **Methods:** The study subjects were 50 medical interns of a Guangxi University of Traditional Chinese Medicine who were interned in the hospital from November 26, 2023 to December 17, 2023. The medical interns were randomly divided into two groups: a control group (conventional health education, 25) and an experimental group (AI psychological counseling technique + conventional health education, 25). The scores of the Self-Assessment Scale for Anxiety (SAS) and the Self-Depression Scale (SDS) were compared and analyzed before and after the intervention. **Results:** Prior to the intervention, the SAS and SDS scores of medical interns in the control group and the experimental group were not statistically different from those of the control group ($P > 0.05$). Following the intervention, the scores of the SAS (47.00 ± 1.93) and SDS (54.08 ± 2.46) of medical interns in the experimental group were significantly lower than those of the control group (54.04 ± 1.67), (61.64 ± 2.26), with a p-value of less than 0.05. **Conclusion:** The AI (Artificial Intelligence) psychological counseling technique has a significant effect in relieving psychological anxiety in medical interns and has high feasibility. Therefore, it is recommended that AI psychological counseling be further improved and be promoted and applied to other populations of medical students who experience anxiety and depression.

Keywords: medical interns, AI psychological counseling, anxiety, survey

1 Introduction

Medical interns represent the future reserves of clinical medical care. Given the characteristics of the profession, they are often required to possess good psychological quality, stable emotions, an optimal personality, and exemplary professional ethics^[1]. During the internship stage, medical interns are exposed to various forms of pressure, which, when excessive, can lead to cognitive bias, anxiety, and depression^[2]. AI (Artificial Intelligence) psychological counseling, which involves the use of robots or

dialogue systems that employ artificial intelligence technology to provide psychological assistance and support to visitors^[3], represents a potential solution to this problem. Currently, there are fewer products on the market that target AI psychological counseling for medical interns. In reality, medical interns are often affected by anxiety when working in clinical internships. In order to alleviate the anxiety of medical interns and enhance their mental health, it is particularly important to strengthen psychological guidance^[4]. This study presents an AI-based psychological counseling program for medical interns, designed to address the issue of psychological anxiety. Additionally, the study proposes the use of the Internet as a means of overcoming the limitations of time and space^[5], thereby facilitating the dissemination and promotion of psychological counseling.

2 Literature Review

A significant number of developed countries have placed a particular emphasis on mental health within the medical service industry. In the United States, the medical profession occupies a more prominent position within society, with a greater focus on the training of medical students and their physical and mental health. In some colleges and universities, counselors are specifically equipped to provide psychological counseling for medical students. Additionally, a number of seminars for job applicants include discussions on the stress and coping strategies of medical students, as well as the challenges and opportunities presented by psychological services for medical students. The United States serves as a case study in the efficacy of AI-based psychological counseling. Data indicate that American users perceive AI as a friendly companion, rather than merely an assistant^[6]. Additionally, 40% of user requests are emotional in nature, rather than informational^[7]. The advancement of machine learning and sentiment analysis has enabled chatbots to respond emotionally to customers^[8]. A number of studies have demonstrated that AI-based counseling has a significant impact on the treatment of mild and moderate depression and anxiety^[9].

In China, the development of psychological counseling has been significantly influenced by traditional concepts. Over the past two decades, Chinese society and culture have failed to distinguish psychological counseling from traditional "mental problems." This has led to a lack of clarity about the nature of psychological counseling and treatment, as well as mental disorders. In the case of school students, many of them are reluctant to discuss their psychological issues and seek assistance from counselors, and parents and teachers are not sufficiently concerned about the mental health of students. To effectively address this issue, AI-based psychological counseling is a highly advantageous approach. Students can utilize computers or mobile devices to seek assistance anonymously through AI counseling. Additionally, teachers and students can engage in one-on-one communication through video, voice, or typing, facilitating problem-solving and protecting students' privacy. This approach avoids the potential harm to self-esteem that can result from traditional counseling methods.

The supply and demand relationship in China's psychological counseling industry is significantly imbalanced, and the professionalism of psychological counseling and

psychotherapy requires improvement. The number of psychological counselors is severely inadequate, and the number of licensed counselors in practice is limited, with a low coverage rate. As of March 2020, the Chinese Psychological Association (2020) has developed a cumulative total of approximately 13,000 individual members. This figure demonstrates that the number of professionals currently practicing is insufficient to meet the vast psychological needs of China. Furthermore, a significant proportion of licensed counselors lack the requisite competence to provide effective counseling services. Chen Xuefeng et al. also observed that the Chinese psychological counseling industry is characterized by a lack of professionalism and service capacity among practitioners^[10]. Therefore, it is crucial to prioritize the professionalism of psychological counseling services and to expand the scope of psychological counseling services while maintaining the quality of psychological counseling^[10].

In conclusion, the development of AI counseling has been effective in some countries, such as the United States. However, the supply and demand relationship in China is severely imbalanced and profoundly influenced by traditional concepts. In China and other countries, there is a paucity of AI psychological counseling, with the majority of AI psychological counseling being directed towards medical interns. The objective of this study is to provide AI psychological counseling for medical interns in the form of a mini-program. This program will assist medical interns in addressing their psychological anxiety issues, which may arise from the mishandling of emotions. The program will utilize scientific psychological assessment scales, AI-based digital calculations, and information collection and processing techniques.

3 Methodology

3.1 Sample

The period from November 26, 2023 to December 17, 2023 was selected as the time interval for this study. A total of 50 medical interns from a Guangxi University of Traditional Chinese Medicine were selected as subjects for this study. All medical interns volunteered to participate in the study after providing informed consent. The medical interns were randomly divided into two groups: an experimental group ($n = 25$) that received the AI psychological counseling technique in conjunction with conventional health education, and a control group ($n = 25$) that received only conventional health education. The experimental group consisted of 4 males and 21 females, aged 20-24 years old, with an average age of (22 ± 2) years old. Of these, 18 were majoring in nursing, 5 in traditional Chinese medicine, 1 in medical testing technology, and 1 in rehabilitation therapy. In the control group, there were 6 males and 19 females, aged 20-24 years old, with an average age of (22 ± 2) years old. Of these, 13 were majoring in nursing, 6 in traditional Chinese medicine, 4 in medical testing technology, 1 in rehabilitation therapy, and 1 in acupuncture and massage. The control group consisted of 6 males and 19 females, aged 20-24 years old, with an average age of (22 ± 2) years old. The group was divided into the following majors: 13 in nursing, 6 in traditional Chinese medicine, 4 in medical testing technology, 1 in rehabilitation therapy, and 1 in

acupuncture and massage. The data from both groups were analyzed, and the results were found to be statistically insignificant ($P > 0.05$).

3.2 Methodology

Prior to grouping, research was conducted on the mental health needs of medical interns through questionnaires and in-depth interviews. This was done in order to gain an understanding of the medical interns' information about their mental health status and needs, the impact of their mental health status on their internship life, and their attitude and willingness towards AI psychological counseling. The medical interns were randomly divided into a control group and an experimental group according to a predetermined ratio. The control group of medical interns was provided with only routine health education, and the data obtained from the questionnaires they filled out at the same time as the experimental group were analyzed and discussed. The experimental group of medical interns received AI psychological counseling techniques combined with conventional health education. The study employs a small program designed to serve as an AI psychological counseling platform. This platform incorporates various functional boards, including an anxiety assessment scale, a link counselor, voice dialogue, a spiritual "tree hole," a salvage the drift bottle, a cloudy and sunny calendar, and others. The experimental group utilizes this platform to implement the intervention.

3.3 Observation Indicators

The mental health status of the medical interns in the two groups was evaluated and quantified using instruments such as the Self-Assessment Scale for Anxiety (SAS) and the Self-Depression Scale (SDS). The scores of the two groups before and after the intervention were recorded ^[11]. The changes in SAS and SDS scores of medical interns in the experimental and control groups before and after the intervention were observed.

3.4 Data analysis

The data were analyzed and processed using the SPSS 25.0 software. All count data were expressed as percentages, measurement data were expressed as ($\bar{x} \pm s$), and a t-test was applied for the comparison of count data. All test levels were taken as $\alpha = 0.05$, and all P-values were two-sided tests, with $P < 0.05$ being statistically different.

4 Results

4.1 Anxiety and Depression in Medical Interns

In a trial involving 50 medical interns from various specialties, anxiety symptoms were absent in 16 subjects and present in 34. Two subjects exhibited severe anxiety (4%), 12 exhibited moderate anxiety (24%), 20 exhibited occasional anxiety (40%), and 16 exhibited no significant anxiety (32%).

Depressive symptoms were absent in 10 subjects and present in 40. Major depression was detected in 12 subjects (24%), moderate depression in 10 subjects (20%), mild depression in 18 subjects (36%), and no significant depressive conditions in 10 subjects (20%).

4.2 The Anxiety and Depression Scores

Prior to the intervention, there was no discernible difference between the SAS and SDS scores of the experimental group and the control group ($p > 0.05$), and the observed difference was not statistically significant. Following the intervention, the SAS and SDS scores of the experimental group exhibited a decline, and the anxiety and depression conditions were improved ($p < 0.05$). Additionally, there was no discernible difference between the SAS and SDS scores of the control group ($p > 0.05$), and the observed difference was not statistically significant. See Table 1.

Table 1. SAS and SDS scores ($\bar{x} \pm s$, scores)

Groups	number of ex-amples	SAS		SDS	
		Pre-interven-tion	Post-inter-vention	Pre-inter-vention	Post-inter-vention
Experimental Group	25	51.76±2.14	47.00±1.93	57.44±2.29	54.08±2.46
Control sub-jects	25	54.72±1.70	54.04±1.67	61.12±2.51	61.64±2.26
t		0.889	4.281	-0.370	2.197
p		0.383	0.028	0.715	0.038

5 Discussion

This study examined the impact of AI psychological counseling on alleviating the psychological anxiety condition of medical interns. A survey and study of 50 medical interns at a Chinese medicine university in Guangxi revealed that the combination of AI psychological counseling techniques and conventional health education could significantly reduce the level of psychological anxiety of medical interns. Prior to the intervention, there was no significant difference in SAS and SDS scores between the medical interns in the control group and the experimental group, indicating that the two groups exhibited comparable levels of psychological anxiety. However, following the AI psychological counseling intervention, the SAS and SDS scores of the experimental group were significantly lower than those of the control group, suggesting that the AI psychological counseling technique has a pronounced effect in alleviating the psychological anxiety of medical interns. Second, in light of related studies, it can be postulated that the mechanism of AI psychological counseling technology in alleviating the psychological anxiety of medical interns may include the following: (1) AI psychological counseling is capable of developing a personalized psychological intervention plan

and implementing appropriate interventions for the specific conditions of each intern. (2) AI psychological counseling is designed to protect the privacy of the interns, encouraging them to discuss their inner pressures and achieve psychological relief. (3) AI psychological counseling provides continuous and stable support, ensuring that interns maintain a positive psychological state throughout the internship process.

According to the study, we suggest: (1) to conduct mental health education for medical interns before the internship, to apply AI psychological counseling to daily mental health education, to help interns understand the difficulties and challenges they may encounter during the internship process, and to make psychological adjustments in advance to further improve the quality of their mental health; (2) Assigning experienced lead teachers to medical interns, providing them with professional guidance on practical operations and emotional support, and helping them better adapt to the internship environment; (3) Providing interns with career planning counseling services to help them clarify their career goals, enhance their career self-confidence, make reasonable career planning, and reduce their employment anxiety.

This study is subject to certain limitations. Firstly, the relatively small sample size may limit the generalizability of the results. Secondly, the study population was selected from a narrow demographic, namely medical interns at a Chinese medicine university in Guangxi, China. This may not fully reflect the applicability of AI psychological counseling among medical interns from a wider range of backgrounds. Future studies could further expand the sample size to explore the anxiety-relieving effects of AI psychological counseling among medical interns from different regions and professional backgrounds.

6 Conclusion

In conclusion, AI-based psychological counseling technology has a significant impact on alleviating psychological anxiety among medical interns and has high feasibility. Therefore, it is recommended to further enhance AI-based psychological counseling and extend its application to other groups of medical students who experience anxiety and depression. Compared to traditional psychological interventions, AI-based psychological counseling technology is more personalized and convenient, and provides novel insights for mental health promotion in medical education.

Acknowledgment

The completion of my dissertation marks the conclusion of my undergraduate studies. The process of writing this thesis was not without its challenges. I would like to express my gratitude to my supervisor, who provided invaluable guidance and support throughout the thesis writing process, from the initial draft to the final draft. I would also like to thank each member of the project team for their contributions and collaboration. In the course of conducting the subject project, your support and companionship provided me with the courage to confront the unforeseen challenges. We collaborated with each other, engaged in discussions, and made progress together. I am grateful for the school's

financial support for our project. This study was funded by the Innovation and Entrepreneurship Training Program for Undergraduates (at the level of autonomous regions) of Faculty of Chinese Medicine Science, Guangxi University of Chinese Medicine (No. S202313643048).

References

1. Zheng,Y.N., Li,X.Y. (2023) An investigation and analysis of the relationship between mental health, psychological resilience, and sense of meaning in life among senior medical students. *Health Professions Education*, 41(16):153-156. DOI:10.20037/j.issn.1671-1246.2023.16.44.
2. Li,Y.S., et al. (2022) Changes in the psychological state and stressors of medical imaging examination students in internships.*Journal of Hubei Institute of Science and Technology*, 42 (06):136-141.DOI:10.16751/j.cnki.hbkj.2022.06.026
3. Li,J.R., et al.(2022)Development and Application of Artificial Intelligence Counseling. *Psychological techniques and applications* , (5) :44-54. DOI:10.16842/j.cnki.issn2095-5588.2022.05.005
4. Hu M., et al.(2023)The psychological stress response of COVID-19 to medical staff and prevention: A large sample study from China.*Front Psychol*, 14:1125847. DOI: 10.3389/fpsyg.2023.1125847
5. Han Y, Lie RK, Guo R. (2020) The Internet Hospital as a Telehealth Model in China: Systematic Search and Content Analysis. *J Med Internet Res*.Jul 29;22(7):e17995. DOI: 10.2196/17995. PMID: 32723721; PMCID: PMC7424477.
6. Costa,P. (2018) Conversing with personal digital assistants: on gender and artificial intelligence[J].*Journal of Science and Technology of the Arts*, 10(3),59-72. DOI:10.7559/citarj.v10i3.563.
7. Xu A., et al.(2017)A new chatbot for customer service on social media.*Proceedings of the 2017 CHI conference on human factors in computing systems*,ACM,New York,NY, USA, 3506-3510. DOI: 10.1145/3025453.3025496
8. Følstad A., et al. (2018)What makes users trust a chatbot for customer service? An exploratory interview study. *Internet science*,11193:194-208. DOI:10.1007/978-3-030-01437-7_16.
9. Lim S.M., et al.(2022) Chatbot-Delivered Psychotherapy for Adults With Depressive and Anxiety Symptoms: A Systematic Review and Meta-Regression.*Behav Ther*, 53(2):334-347. DOI: 10.1016/j.beth.2021.09.007
10. Chen,X.F.,Fu,X.L.(2020)Fighting the epidemic highlights the urgency of building a psychosocial service system[J].*Proceedings of the Chinese Academy of Sciences*,35(3):256-263.DOI:CNKI:SUN:KYYX.0.2020-03-006.
11. Bai,M.L., et al.(2023)Survey on the status of anxiety and depression among undergraduates of clinical medicine in a university in Hebei Province and analysis of their influencing factors[J].*Journal of Hebei North College(natural sciences edition)*,39(12):19-22+25.DOI:10.3969/j.issn.1673-1492.2023.12.006

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

