Research on the Application of Artificial Intelligence in Mental Health Literacy Service for Middle School Students

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Abstract: Artificial Intelligence (AI) is applied to improve the mental health literacy of middle school students. It can effectively improve the efficiency, effectiveness and feasibility of this service. Through the current big data analysis and machine autonomous learning technology, AI can analyze the characteristics of students' behavior patterns and physiological data by training the model used. This paper examines how artificial intelligence can improve the mental health literacy of middle school students. It begins by analyzing and interpreting three key factors that influence their understanding of mental health. Firstly, it analyzes and interprets the three factors that affect the mental health literacy of middle school students. Then from these three factors, the author discusses how artificial intelligence can be applied to enhance the mental health literacy of middle school students. That is to say, it puts forward the new application of artificial intelligence technology in mental health counseling, emotional recognition, mental health assessment, media publicity and education. For example, the use of artificial intelligence to develop virtual psychological teachers, through language processing analysis and emotional recognition to provide online counseling services; It develops emotion recognition function through video and speech analysis of artificial intelligence, and uses digital signal processing means. Through the comprehensive analysis of a large number of data, the mental health evaluation system is gradually intellectualized, so that the evaluation model standard is more targeted.

Keywords: middle school students, mental health literacy, influencing factors, artificial intelligence.

1. Introduction

Running a National Advisory Committee on Mental Health Education in Primary and Secondary Schools at the Ministry of Education of China since 1999, China gives more weight to mental health problems that middle school students have. However, mental health literacy for middle schoolers remains another central concern of the plan. Yet, mental health literacy remains a bit ambiguous to the vast majority of Chinese middle school students at present. Middle school students can have very little knowledge or understanding about the actual mental health problems that other people may be going through. The act of some people delaying or bypassing treatments, even when the problems being treated are mental health problems, is more frequent, and they usually treat the therapy with skepticism. Thus, this illustrates that Chinese middle school scholars receive a lower quality and more simplified amount of studying material in school, where mental health literacy is concerned. Fu

Xiaolan et al. revealed that around 14.8% of adolescents recorded in the study showed varied levels of depression symptoms' predisposing factors [1]. The performance was positively linked with the grade obtained, with the prevalence rate of depression and anxiety risk among students in rural secondary schools showing a markedly higher percentage. 20.0% and 43.6%, respectively (34.5% of such risk levels is characterized as mild anxiety) [1]. According to studies, an elevated level of mental health literacy is really useful for individuals to get a picture of their own mental health problems [2,3]. For this purpose, it can successfully plummet straight to the bottom while actively looking for mental treatment by professionals. Until now, the present-low mental health literacy level gets attributed to the low overall state of mental health knowledge in China. As stated in the work of Yang Zongsheng, the recognition rate of mental illness among adolescents who are in school is lower than that for students of the same age group in other countries [4]. Despite this, the identifying rate of depressive disorder is the lowest, which is a big effect on the local economics and education in the indigenous areas. While at the same time, it is, in many cases, very much connected with the pressure of entering school for middle school-age students. The research findings suggest that; when middle schoolers are hit by mental issues, they will most likely choose to talk to friends or family [4]. It was those non-professional things, for example, peers or teachers, that a bigger part of middle school youth was looking for in help, and such people had few qualifications as psychologist helpers. Mental health education, therefore, is of significant importance when it comes to the public preventing themselves from seeking professional help. Young adolescents' comprehension of the function, function, and efficiency of professional psychological support made by experts is not of high-level nowadays. Contributors are family issues, problems with schoolmates, increasing academic pressure, etc., which, during this time, deeply affect a young adolescent's psyche. By now, the negative stuff on the web also spreads mental health diseases among middle school students. Neglecting such situations can lead to a radical rise in middle school mental health literacy, which may cause a person not only to be more cognizant of their own function but also the quality of their life in the future. Therefore, it is particularly important to prevent and treat mental health problems of middle school students.

With the advent of the era of big data, through the analysis of a large amount of information about various businesses of education, Artificial intelligence provides a new solution to deal with the mental health problems of middle school students. AI can use its own advantages to quickly analyze a large amount of data. Through the learning model, students' physiological data and behavioral characteristics can be identified, so as to accurately judge their mental health status. This kind of analysis is helpful to find out the potential mental health problems of students in advance. Nowadays, with the rapid development of science and technology in the world, AI technology is changing with each passing day. Robot technology is playing an increasingly important role in mass production and public service. It has become an important symbol to measure the level of scientific and technological development of a country and one of the great creative inventions since the 20th century. At present, AI is mainly used in personalized education, learning support and assessment in the field of education [5]. The introduction of AI has changed the traditional thinking of most people, and it can be used as a medium tool for teaching. It will not have a direct impact on teaching itself, but it can be used by teachers and play a role in teaching. For example, personalized mental health education can be customized for individuals through software as a further supplement to face-to-face therapy [6]. The iCub developed by the Italian Institute of Technology can identify objects through the collected data, receive learning tasks and execute them. The educational robot developed by Hottford University can be effectively used to assist autistic children. The results show that the interaction between autistic children and educational robots is good and very positive [7].

Artificial intelligence technology has a wide application prospect in mental health services. It can improve the shortcomings of existing mental health service technology, improve its accessibility,

efficiency and improve results. The purpose of this paper is to explore how the existing AI technology can be applied to enhance the mental health literacy of middle school students in order to provide more comprehensive and effective support in order to improve the mental health literacy of middle school students.

2.   Mental Health Literacy

The notion of mental health literacy was derived from health literacy, which was first introduced by Jorm and other factors patented in 1997 [5]. Hosting awareness is thinking and behaving, so they're able to identify the disorders could be handled or can be prevented. It mainly refers to having the skills for recognizing psychological disorders, the skills for positioning mental health diseases, as well as the ego for coping with mild psychological disorders and seeking professional rescue strategies. The conception of mental health literacy was updated by Jorm in 2012, with him adding some practical skills [2]. Certain presentations of mental health literacy have been removed but the focus has shifted more towards individual help providing to others. Jorm's new assessment of the terminology of mental health literacy has been accepted widely. Some researchers propose that mental health literacy constitutes an important part of the process of both seeking and receiving psychological help, respectively [8]. The critical issue is that Kutcher suggested some major points he would include in the concept of mental health literacy: How to obtain positive mental health status, understand the basic treatment of mental illness, understand the knowledge and ways to seek psychological assistance and four aspects of reducing the stigma of mental illness. When compared with Jorm's definition, Kutcher's definition can be said to be more global [8,9]. Mental health literacy is the important concept where people not only are able to identify psychological barriers, but also possess the knowledge of how to get rid of these psychological barriers. It provides Chinese researchers with the opportunity to integrate the former narrow mental health literacy conceptualization further. In order to put it differently, it covers the meaning of mental health literacy. Ming Zhijun and Jiang Guangrong put forward the concept of mental health literacy in a broad sense, including knowledge, skills, actions and attitudes [9]. It is characterized by a separation between mental health promotion and coping with mental illness, and "self-others" is a new dimension characterized by Chinese culture. A new theoretical framework has been formed. At present, the mental health literacy term and its meaning complexity are being developed, and there are no attempts to realize unification. The model of integrated mental health literacy and the idea of specific measures of mental health literacy consequently serve the academic purpose. The choice of a broad or narrow concept hinges on the purposes of research and the methods of investigation. The concept that is broader and more holistic may be more effective for large-scale epidemiological surveys and assessments, and may be the best preventive tool in the development of well-designed studies that focus on specific intervention measures [10]. Individual and self-directed mental health literacy can be also improved.

3.   Factors Influencing Mental Health Literacy

3.1.   Individual Factors

Individual factors refer to the effects on mental health literacy due to them. The basic factors involve gender, age, and education level (academic years). According to Yang Zongsheng, only a tiny fraction of women refers specifically to a mental illness compared to men, who are usually general in their cognitions of mental illness [4]. Middle school students feel more inclined to seek help from others when dealing with any such condition. Gender distribution does not differ into much, but there is a significant difference among the students attending various grades in middle school. Fuxiaolan also added that as aging occurs, youths' ability to pursue professional help would gradually affect their

enthusiasm [1]. It is evident that the component of age is the most serious factor that determines the level of acceptance or lenience of the individual towards psychological problems. The ability of a person to acknowledge mental illness, and cognitive disorder as well as a positive attitude towards seeking help will certainly influence the mental health literacy of this person. It appears that the cognitive impairment of mental health conditions often makes individuals feel socially rejected, and even limits the belief in the importance of mental health literacy knowledge. From this, it can be seen that such a situation can only occur when people are able to correctly articulate psychological barriers and then have an honest attitude towards mental health so as to create mental health literacy. Stigmatization of mental illness will also be an important hindrance to this endeavor.

3.2. Social Factors

Thus, social factors, such as peer and family support, also play a role in the development of mental health literacy among middle school-aged youth. This disparity is not only obvious with the scarcity of education resources in primary and secondary schools; the distribution of resources in mental health support in these schools, one way or another, is a serious problem [11]. To add to that, counseling personnel is scarce, little room for counseling, and lack of funds are detrimental to psychological assistance and counseling. Institutions to which primary and secondary school students are sent for their mental health needs, either fail to recognize the urgency of the situation and provide appropriate care timely or lack the convening power to direct state and national resources towards these institutions, hence the progress of mental health care services is hindered. Also, the presence of certain laws in favor of mental health care is another reason for its very low popularity. Not enough social acknowledgement results in many middle school institutions holding back from providing programs with mental health education systematically. Due to these issues, they are not able to realize their emotional problems to the full extent, in turn, solving them. As seen in some studies conducted in Europe, campaigns against social discrimination and the involvement of psychological education are effective methods for raising mental health literacy levels. The former collaborated with the government and social organizations in the social anti-discrimination campaign, which demonstrated the power that media can wield to get the word out [11]. Emphasizing narrower mental health issues categories and intensifying locals' mental health literacy have been the methods that made more changes in the area there [12]. This study established that such social activities seem to be effective in elevating society members' understanding of psychological disorders and also in promoting a positive attitude towards mental illness and reducing stigma; thus, help-seeking behavior on a scale much larger. In the Guiding Opinion regarding mental health service improvement issued by China in 2016, there was also a suggestion. Enhancing mental health literacy is the ultimate aim of mental health programs these days. Yet, very few interventional studies are there that examine mental health literacy as a whole concept [13]. The primary emphasis has nearly always been on the mental constitution of individuals living with mental disorders and those surrounding them in research. Numerous researches going on all over have it that education in mental health can mitigate the stigma associated with patients and families and make a great many of them seek assistance in hospitals. Eventually, it also helps to raise the public's mental health level by improving awareness and skills at the individual level while dealing with mental barriers. Additionally, psychological health among the public is enhanced. It is an efficient intervention to lift the level of mental health literacy.

3.3. Environmental Factors

Mental health problems interact with each other because middle school students' mental health problems usually arise from the influence of more than one aspect such as family background, geography, and school pressure. From the results of the research done by Hurley et al., it is found that

health level is also affected by some environmental conditions. These include a school education environment and a cultural background [14]. First and foremost, schools are the principal venue for middle school students to learn their lessons and interact with one another. Mental health education policy and quality of school environment are two crucial factors that influence the mental health literacy of middle school students. Secondly, students of various ages deal with an assortment of mental health problems [4]. For instance, puberty gives rise to physical and emotive changes, which may trigger depression and anxiety risks. Others may also be hiding their mental health issues just because they dread discrimination from their peers. This, in turn, increases the chances of missing mental disorders and wrong diagnoses. Consequently, the right mental health education publicity in schools and the public sphere will speed up the promotion of mental health literacy among middle school students. However, one important factor that determines the mental health of middle school students and teens is the cultural background they come from, unlike teens in other cultural backgrounds. Asian teenagers in culture, compared with their peers in other cultures, are more likely to face the problem of mental problems avoidance [15]. Hence, such cultural background should also be given great attention when operating on mental health literacy among students in school during the summertime in China. At present, the mental support system in an area has both its strengths and weaknesses, and there is a clear difference when comparing the urban and rural areas as well as different regions. The geographic area is more developed in terms of financial resources, mental health clinical services, and the availability of professionals. Through the network program, schools and communities with mental health education needs could receive qualified assistance. But, the lack of proper medical programs to support these issues in underdeveloped areas makes getting help harder for middle school students. Either way, both rural and urban high school students have diverging approaches to identifying their psychological problems [1,13]. Nevertheless, the rural adolescents came in with a low level of knowledge regarding the processes of seeking help and the time it takes for recovery from psychological disorders. The role of education in the development of children's mental health literacy can be considered from this perspective. Individuals with less education are more likely to hold stereotyped attitudes towards mental diseases. Thus, it should come to the attention of the authorities and everyone involved to make sure regional differences lessen and the mental health system develops evenly.

4. The Application of Artificial Intelligence in Improving Middle School Students' Mental Health Literacy

Artificial intelligence has broad prospects in mental health services. It can effectively improve the accessibility and effectiveness of mental health support. Zhongke Zhiji and some other relevant institutions in China have jointly developed a mental health assessment system based on speech recognition and natural language processing [16]. The system can automatically evaluate that mental health and the emotional state of the middle school student by identifying the characteristic, Analyze the data of students' pronunciation, intonation and emotional state, and find out the psychological problems of middle school students in advance so that provide assistance to individuals in need of therapeutic intervention.

The application of artificial intelligence in mental health assessment is mainly through the analysis of the behavior patterns and language characteristics expressed by individuals to provide assistance to psychotherapists in conducting psychological diagnosis and help them customize individualized treatment programs for individuals [16,17]. Such assessment tools can effectively improve the effectiveness of mental health treatment and provide emotional comfort and support for consultants. It can also help students understand coping strategies and emotional management skills for mental health problems.

Artificial intelligence tools collect and analyze individual physiological signals (such as heart rate and blood pressure) and behavioral signals (such as sleep time and exercise time). It can effectively help users find potential mental health threats and monitor mental health status in time. Effective intervention measures should be taken in time. The application of such monitoring tools in middle schools can effectively help middle school teachers and parents to find out students' mental health problems in time and promote the improvement of mental health literacy of middle school students [18]. Developing online chat robots can be applied to some users who are unable to go to institutions for treatment in person due to objective reasons; Developing applications related to mental health can effectively help users to self-test their mental health status. To help them understand their own situation; to develop intelligent robots to provide mental health services for middle school students. It can improve middle school students' understanding and awareness of mental health problems, and help educators pay attention to students' mental health needs, it can also help them allocate resources on demand [7, 19].

5. Conclusion

Generally speaking, artificial intelligence has been gradually accepted by mental health education and has made many contributions to the field of mental health. At present, artificial intelligence mainly serves the clinical psychotherapy of medical institutions, providing psychological counseling and counseling to people of different ages. Artificial intelligence currently plays an important role in mental health services in primary and secondary schools. But after all, it can not replace the interaction of professionals. Future research directions include a more in-depth exploration of AI technology's judgment of the emotions expressed by language. To provide more personalized support. Attention should also be paid to the long-term costs and benefits of AI mental health services to determine the most suitable way of education for schools and students. Continuous innovation in mental health education technology will ensure that students of all ages in all regions have access to guaranteed mental health services. This paper discusses the application prospect of artificial intelligence technology in the mental health service of middle school students. By analyzing the complexity of mental health problems of middle school students, the limitations and problems of the traditional mental health service system are recognized.

Through further practice and research, we can further broaden the application scope of artificial intelligence in the mental health service system of middle school students. Failure to achieve this goal requires strong support from home-school collaboration, government policies and relevant research institutions. In order to continuously optimize the application of artificial intelligence in this field. Through the wide application of artificial intelligence technology, it is helpful for parents and teachers to pay more attention to students' mental health. Therefore, this technology has great potential value and application prospects in the field of mental health literacy of middle school students. Through the analysis and processing of the data, it can provide personalized support services for students and help them better understand the psychological barriers. To better manage mental health problems such as anxiety and depression, and to assist in the formation of mental health literacy among middle school students.

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