

Multidimensional intervention strategies for adolescent depression and anxiety

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Abstract. This paper discusses the significance of adolescent depression and anxiety issues and their threat to global public health. With the development of society, the age of onset for mental health disorders in adolescents has become younger. The World Health Organization (WHO) estimates that 20% of adolescents worldwide are affected by mental disorders, including depression and anxiety. These disorders not only limit adolescents' participation in social activities but also hinder their physical and mental health growth. Therefore, this article focuses on several approaches to addressing adolescent mental health issues, including antidepressant medications, AI-assisted wearable devices, animal-assisted therapy, and prevention programs. The article emphasizes the importance of addressing these issues during adolescence to prevent future diseases and disabilities, and presents a variety of solutions aimed at improving adolescent mental health through comprehensive treatment methods and preventive measures.

Keywords: adolescent, depression, anxiety, AI wearable devices, animal-assisted

1. Introduction

For each individual, adolescence is a critical and unique stage in the life cycle, and due to rapid social, emotional, and cognitive changes as well as critical life transitions, may be met with psychological difficulties due to a lack of self-control in behaviors that may be manifested both physically and psychologically. In the long run, these effects may deteriorate into mental disorders such as depression and anxiety. Depression is a globally prevalent mental illness that impairs physical, social, and occupational functioning [1]. Depression manifests itself in a variety of ways and affects people at different stages of life, and the current age of onset of mental illnesses such as depression is trending younger as society evolves. An increasing number of adolescents are at risk of an outbreak of mental health problems, which threatens major public health globally. The World Health Organization (WHO) estimates that mental disorders, including depression and anxiety, affect 20% of adolescents worldwide [2]. These disorders can cause significant stress during the developmental years of adolescents, limiting participation in social activities and hindering healthy psychophysical growth. In addition, about 50% of adult mental disorders are statistically attributed to mental health problems in childhood or adolescence [3].

Therefore, it is critical to address these issues during adolescence to prevent future illness and disability. Through extensive research and discussion, psychologists in various fields have proposed solutions to adolescent mental problems, including traditional therapies and the use of antidepressants.

2. Methods

2.1. Antidepressants

Traditional medication for depression has long been seen as a straightforward and effective therapy for patients. Due to its efficacy, this approach has become the primary treatment cost for depression and is the choice of an increasing number of patients. Data shows that the use of antidepressants has increased from 1.3 per cent to 1.6 per cent in the United States, from 0.7 per cent to 1.1 per cent in the United Kingdom and from 0.3 per cent to 0.5 per cent in Germany [4].

Antidepressants use a psychoactive compound known as a psychedelic (usually found in certain types of mushrooms) to produce a hallucinogenic effect in the brain, which in turn leads to changes in mood and perception [5]. Studies have shown that

adjunctive treatment with silymarin, which contains psychoactive compounds, has significant antidepressant effects when used in conjunction with supportive psychotherapy. And it has been demonstrated through certain clinical use that it can achieve increased efficacy, freeing patients from depression for up to a month.

However, while the drug does have effective therapeutic effects in the treatment of mental illnesses from a research perspective, the effects of the drug and the ingredients it contains on the human body are unavoidable. The Food and Drug Administration (FDA) of the United States has shown through extensive analyses of relevant clinical trials that patients taking antidepressant drugs for a long period of time may develop suicidal thoughts or suicidal behaviours, especially children and adolescents, and may aggravate the patients' depressive moods, thereby aggravating their conditions. In addition, side effects of depression medications include headaches, increased sweating, and weight gain [6]. Although antidepressant medications have the potential to be effective in relieving symptoms, side effects such as the possibility of exacerbating depression instead still prevent them from being the perfect treatment.

2.2. Wearable devices with AI

In the treatment of depression, the monitoring and diagnosis of the patient's symptoms is an extremely crucial step. While traditional methods of diagnosing and treating mental illness require the support of a large number of mental health professionals, wearable devices incorporating AI technology offer a more convenient option for assessing anxiety and depression, as they provide comprehensive data charts for both the depressed patient and the corresponding treating physician [7]. Supported by artificial intelligence technology, wearable devices have made significant progress in identifying and managing anxiety and depression. By monitoring a patient's temperature, blood pressure, cardiac activity and electroencephalographic activity, more specialised care can be provided to depressed patients. Patients' symptoms can also be assessed through real-time data collected by wearable devices, allowing for more effective diagnosis and monitoring of patients with these disorders [8].

For adolescents suffering from depression, wearable devices can be used in various environments and situations in a variety of common forms, such as wearing smartwatches, bracelets, and glasses. Wearables are perceived by this group of patients as being more fashionable, less intrusive and distracting, and simpler to operate [9]. As the prevalence of adolescents accounts for a large portion of depressed patients with current mental illnesses, wearing a guardian societal device in a normal manner can assist the patient to better integrate into a societal environment.

In addition, AI-driven therapy is expected to improve the quality of care while closing the communication gap between patients and physicians [7]. Studies have shown that 83% of patients consider miscommunication to be the most challenging aspect of their interactions with their doctors, emphasising the need for improved communication between patients and healthcare providers. Incorporating wearable AI into healthcare can change the way doctors and patients communicate, while providing highly specific information about treatment, thus enabling doctors to tailor the dialogue accordingly.

Consequently, many healthcare organisations have introduced robotic therapists into the process of treating illnesses, especially depressed adolescents, a group that can feel isolated, fearful, and even desperate during medical interventions. Hours feel like days, and days feel like years. Experiments have proven that the use of robotic therapists in clinical settings can reduce stress levels in adolescents, thereby improving treatment outcomes [10]. These robots providing 24/7 companionship can also ensure the physical and mental well-being of adolescents.

The continuous support and secure health data management provided by wearable AI offers a more efficient and effective approach to depression treatment. It undoubtedly enables clinicians to provide more personalised, real-time support to patients, leading to better health outcomes.

As well as, the ability to process and analyse massive amounts of health data, including psychological states and medical records, faster than traditional methods comparable to wearable AI, allows for a deeper understanding of a teenager's health, enabling healthcare professionals to develop more accurate analyses and personalised treatment plans, which in turn can greatly improve patient recovery rates [11].

Although socially assisted robotics (SAR) makes a significant contribution to medical practice, it may also raise a large number of challenges related to moral hazard and ethical risk. Research on SAR emphasises that SAR is seen as a threat to personal privacy due to its surveillance capabilities to access, store and process personal data [8]. Patients may refuse to use wearable AI for fear of personal information being compromised. In addition, the use of SAR may contribute to or even exacerbate the patient's sense of isolation, which may lead to the loss of normal interpersonal interactions. The invocation of AI in life essentially reduces the possibilities of social interaction between people, thus reducing the opportunities for interpersonal communication, which may seriously hamper a person's recovery [12].

2.3. Animal-assisted therapy

Animal-assisted therapy is a medical treatment that uses the help of animals to improve the physical and emotional well-being of people suffering from certain diseases. According to medical reports, animal-assisted therapy helps boost endorphins, which are hormones that block nerve cells that receive pain signals [13]. These hormones play a crucial role in modulating a patient's attitude

and response to anxiety, while also promoting feelings of joy and well-being, which can greatly reduce negative emotions in depressed patients.

When faced with difficult situations, adolescents with depression tend to think negatively, reflecting a lack of self-belief and a negative attitude towards their own abilities and developmental potential. However, when petting or interacting with an animal, the patient's attention is drawn to the animal, which in turn automatically releases psychological stress and helps the body reduce stress levels [13]. In addition, animal therapy can compensate for the lack of hope that ill adolescents experience; owning an animal as a pet can make the patient feel happy and fulfilled, and in turn experience a strong sense of dependence of the animal on the person. This experience of caring for an animal can serve as an emotional support that allows the depressed teen to step away from worry and focus on the present moment.

Unlike traditional therapies that treat patients directly, animal-assisted therapy ensures that the entire process is gradual and progressive, minimising risks and providing a calming effect on the patient [3]. The effectiveness of animal-assisted therapy has made it an important tool for those seeking a stable and beneficial treatment option, making great strides in psychology and beyond.

2.4. Prevention programs

While the current discussion on depression focuses on subsequent treatment programmes, prevention in the early stages is equally important. There is growing evidence that prevention programmes have a positive impact on reducing depressive symptoms as well as affective disorders in adolescents [14]. Prevention programmes can prevent recurrence of the disorder and reduce the incidence by up to 22% per year. In addition, the risk of depression is expected to emerge and climb rapidly during adolescence [13], as well as adolescents comprising a significant proportion of the depressed population, as their behaviour is relatively more malleable.

In the early stages of life, when an individual's behaviour is relatively easy to shape and change, a range of approaches can be used to increase adolescents' awareness of mental illness and the correct way to deal with their emotions, thereby reducing the likelihood of subsequent depression and other mental illnesses. Implementing preventive programs during adolescence is more conducive to the recovery of people with depression than treating them with therapeutic regimens after cognitive and behavioural patterns are already set and entrenched [15, 12, 6].

In terms of therapists, those responsible for prevention programmes tend to require more training related to them, have developed greater expertise in delivering interventions, and are more lenient in terms of time requirements, compared to therapeutic interventions [6].

Preventing depression and anxiety is an attractive goal, and although numerous studies have shown that this approach is effective and has not yet been shown to be generalisable, this also means that new avenues and approaches should be continually explored, for example, further in-depth research could be carried out into the specific effects of different types of preventative programmes in different groups of adolescents, including the impact of factors such as gender differences, differences in family environment, and so on, on the effectiveness of preventative programmes, and can also explore how to better integrate the preventive programmes with school education and family education, so as to enhance the effectiveness of the implementation of the preventive programmes. At the same time, the role and function of therapists in prevention programmes can also be studied in greater detail, for example, how therapists can be better trained to be more effective in the prevention of depression and anxiety.

3. Conclusions

Depression and anxiety in adolescence is a long-standing issue with significant implications for a variety of fields, including health, science, and psychology. Globally, various treatment programmes for depression are under active development, including depression medication, AI and wearable devices, animal-assisted materials, and prevention. Antidepressant medications: antidepressant medications are the main choice for the treatment of depression due to their immediacy and effectiveness. However, the possible side effects and potential risk of suicide associated with long-term use, especially in children and adolescents, require us to consider their use more carefully. The combination of AI technology and wearable devices offers a more convenient and personalised solution for the monitoring, diagnosis and management of depression and anxiety. They enable real-time monitoring of patients' vital signs and behavioural patterns, providing doctors with more accurate treatment recommendations. However, this also poses privacy and ethical challenges, requiring us to ensure the security of patients' personal information and the reasonableness of human-computer interaction while advancing the technology. Animal-assisted therapy provides patients with emotional support and stress reduction pathways through interaction with animals. This therapy has a positive effect on improving the mental health and emotional state of patients, especially among adolescents, and can provide a non-pharmacological, more natural way of healing. Prevention programmes have shown positive results in reducing depression and affective disorders in adolescents. Through early intervention, we can reduce the risk of depression and other mental illnesses through education and intervention before adolescents' behavioural and cognitive patterns solidify.

In summary, the treatment and prevention of depression and anxiety in adolescents is a multifaceted endeavour that requires a combination of medication, technological innovations, emotional support, and preventative measures. Future research and practice

should continue to explore the optimal combination of these approaches, taking into account individual differences, cultural contexts, and ethical issues, to achieve more effective mental health interventions.

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