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An Analysis of the Symptoms and Treatments of Functional Dyspepsia in Generalized Anxiety Disorder among Chinese Adolescents

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Abstract:

This study examines the symptoms and treatments of functional dyspepsia (FD) among Chinese adolescents with Generalized Anxiety Disorder (GAD). Although much research has already focused on how anxiety affects gastrointestinal health, few studies have examined Chinese adolescents or considered the side effects of treatments as the main criteria. Through a literature review, expert interviews, and adolescent surveys, this research analyzes the connections between FD and GAD and evaluates current therapies. The findings may help conclude that neurotransmitter imbalances and gastrointestinal dysfunction contribute to FD in GAD patients. Current treatments include drug therapy (such as antidepressants) and non-drug therapy (such as cognitive behavioral therapy and mindfulness-based stress reduction). While medications can be effective, they often cause side effects, whereas psychological therapies may take longer to show results. Therefore, this study recommends a combined treatment approach to balance efficacy and minimize adverse effects. It also emphasizes the need for anxiety management education to reduce stress-related gastrointestinal symptoms. By addressing this research gap, the study provides insights for improving clinical interventions and preventive strategies for Chinese adolescents.

Keywords: Generalized Anxiety Disorder; Functional Dyspepsia; Chinese adolescents; Comprehensive treatment strategies

1. Introduction

Everyone experiences anxiety at some point in their daily lives. However, in some cases, anxiety may persist to the extent that it affects a person's daily functioning, including job performance, schoolwork, and relationships. When this occurs, individuals may be diagnosed with an anxiety disorder, as defined by the DSM-5. Anxiety disorders can be classified into several types, with Generalized Anxiety Disorder (GAD) being one of the most common psychiatric disorders in the United States. Individuals with GAD often experience excessive anxiety about ordinary, everyday situations. Although the exact etiology of GAD remains unknown, a central aspect of various etiological models is the patient's dysregulation of worry. Moreover, evidence shows that people with GAD may exhibit sustained activity in brain regions associated with mental activity and introspective thinking related to worry. Environmental and genetic factors are also considered potential contributors to GAD (Locke et al., 2015).

Many mental illnesses are persistent and chronic, and GAD is no exception. Additionally, GAD may lead to dyspepsia, a common gastric disorder that affects up to 40% of the general population and significantly reduces quality of life (Ford & Moayyedi, 2013). Taché and colleagues demonstrated that, in response to chronic stress, the gastrointestinal motor function undergoes self-regulation, leading to inhibited gastric emptying. They also found that corticotropin-releasing factor subtype 1 receptors play a role in colonic and anxious stress responses and may be clinically relevant in anxiety, depression, and irritable bowel syndrome comorbidities (Taché et al., 2001).

According to some medical definitions, Functional Dyspepsia (FD) is stomach pain without an identifiable cause. It is characterized by a feeling of fullness during or after eating, or a pronounced burning sensation in the middle upper abdomen below the sternum, which may not necessarily be related to meals (Vikram Rangan, 2020). Figure 1 shows the criteria for diagnosing FD (Harer & Hasler, 2020).

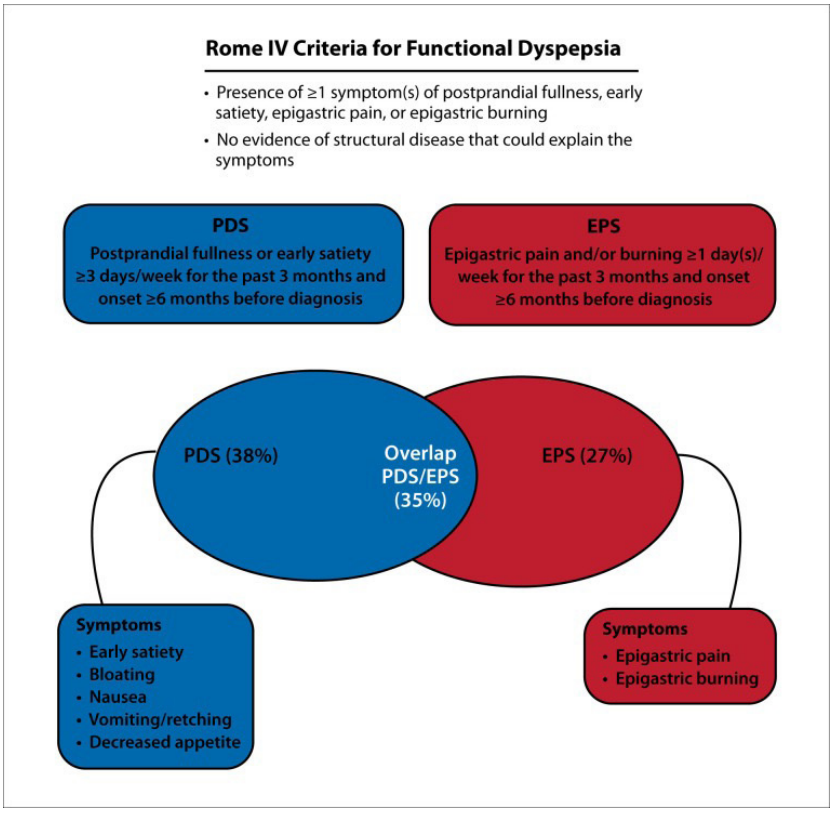

Figure 1. Rome IV Criteria for FD (Harer & Hasler, 2020)

There appear to be no studies specifically assessing FD in Chinese adolescents, who often face significant pressure to succeed from society, peers, and family. Anxiety among this group had a pooled prevalence of 26% during the COVID-19 pandemic (Ma et al., 2021). Therefore, by interviewing Chinese adolescent psychologists and psychological counselors and reviewing literature from Google Scholar, PubMed, ScienceDirect, and other academic platforms, this study aims to evaluate existing FD treatment methods and propose potential solutions to mitigate the

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side effects associated with some of these treatments.

2. Literature Review

In this research, the literature review is divided into three main sections. First, I will present and analyze key studies on the symptoms of FD, particularly those linked to GAD and other mental disorders. The second section will examine the aspects of FD treatments related to GAD and other mental disorders that have been previously explored. Finally, I will systematically assess the contributions of these studies to this research and highlight the existing gaps in the field.

2.1 Discussions about FD's symptoms

FD does not involve organic lesions and has relatively complex diagnostic criteria, but researchers generally agree on its symptoms. According to a 2020 review, FD manifests through the following symptoms: (i) epigastric pain, (ii) epigastric burning, (iii) postprandial fullness, (iv) early satiety, (v) epigastric swelling, (vi) nausea, and (vii) hiccupping (Harer & Hasler, 2020). Based on these symptoms, Enck (et al., 2017) classified FD into postprandial distress syndrome (PDS) and epigastric pain syndrome (EPS), with an additional subtype exhibiting overlapping features. Tack and Talley (2013) further distinguished PDS by its characteristics of postprandial fullness and early satiety, while EPS is mainly characterized by epigastric pain or burning. These classifications provide clear criteria for diagnosing FD and identifying its subtypes, forming an essential background for this research.

Loyd and McCLELLAN (2011) these symptoms often coexist with anxiety and depression. Similarly, a questionnaire-based study found that FD patients exhibited the highest levels of depression and anxiety in the study population (Filipović et al., 2013). The reference to anxiety and depression in these studies highlight the potential relationship between FD and psychological disorders, serving as crucial evidence for this research.

Since FD overlaps with other gastrointestinal disorders, researchers have examined its pathology, pathogenesis, and pathophysiology to differentiate it from similar conditions. Mental health factors are frequently discussed in this context. Miwa (2012) proposed that FD symptoms result from two primary physiological abnormalities: gastric motility dysfunction and visceral hypersensitivity. These abnormalities arise in patients who overreact to stress due to early-life environmental factors, genetic predisposition, residual inflammation from gastrointestinal infections, or other causes. The process is further influenced by psychophysiological abnormalities and abnormal gastric acid secretion. This explanation reinforces the connection between mental health disturbances and FD, supporting the theme of this study.

Later studies confirmed that anxiety often precedes FD, with psychological distress identified as an independent causal factor (Talley, 2017). By 2019, a consensus emerged that gastric motility abnormalities (such as inadequate fundic accommodation or delayed gastric emptying) and gastric hypersensitivity are key contributors to FD symptoms (Enck et al., 2017; Miwa et al., 2019). Notably, as early as 2013, researchers established that psychosocial factors and psychiatric comorbidities can influence gastric motor function—including regulation and emptying—via the autonomic nervous system and stress hormone pathways (Van Oudenhove & Aziz, 2013). All the above studies indicate that psychological factors and mental diseases, especially anxiety, significantly impact gastric function and play a crucial role in FD development, underscoring the strong connection between the two conditions explored in this study.

2.2 Discussions about treatments of anxiety-caused FD

After understanding the symptoms of FD, giving the right therapy is essential. A review of nine randomized controlled trials demonstrated that non-pharmacological treatments, particularly psychological interventions, are beneficial for FD patients and should be considered by physicians if feasible and preferred by the patient (Rodrigues et al., 2021). Mounsey (et al., 2020) concluded that FD patients of all ages should limit the intake of foods that can trigger FD and adhere to recommended dietary protocols. Additionally, experiments by Rane (et al., 2021) confirmed that aerobic exercise can serve as an adjunctive therapy to aid FD recovery. Since these therapies are also widely used for GAD and other mental disorders, their overlap further supports the close relationship between GAD and FD, strengthening the theoretical foundation of this study.

Regarding traditional drug therapy, tricyclic antidepressants (TCAs) have consistently been shown to be effective in alleviating FD, particularly intractable cases (Ford et al., 2017; Koduru et al., 2018; Lu et al., 2016; Madisch et al., 2018). They have even been listed as a second-line treatment in the 2018 American Gastroenterological Association and Canadian Gastroenterological Association guidelines on indigestion (Tomita et al., 2018). Amitriptyline (50mg) was also found to improve FD symptoms at the same time (Lacy et al., 2018). However, Lu (et al., 2016) criticized the increased incidence of adverse events among FD patients taking antidepressants, which cannot be overlooked. The use of antidepressants highlights both

the significant impact of anxiety and emotional disorders on FD and the necessity of evaluating them as a reliable mainstream therapy in this study. Interestingly, Tominaga (et al., 2018) reported that the Japanese herbal medicine Rikkunshito has shown potential in alleviating both gastrointestinal and psychological symptoms in FD patients. Since this single treatment appears to address both issues simultaneously, its efficacy and associated conditions worth further investigation in this study.

2.3 Evaluation and reflection

Previous articles above have examined many aspects of FD, including but not limited to symptoms, treatments, and the mental issue and connection to FD. Their findings provide a comprehensive understanding of FD, helping to present the disorder more clearly to the public. Since FD is easily misdiagnosed and its exact cause remains uncertain, these studies hold significant value. Additionally, they provide a solid background for this research. By reviewing them, I have gained a deeper and clearer understanding of FD and can confidently suggest that there is a significant correlation between GAD and FD.

However, to my knowledge, I have not yet seen any studies setting the severity of the side effects of each treatment as its primary criteria. Because they are medical treatments, regarding the patient's body as the priority should be the most important criteria. If the side effects of each treatment are not specifically studied and introduced, patients may suffer a lot of unnecessary pain because they choose an inappropriate treatment.

This study aims to fill this research gap. Furthermore, I have not found studies specifically focused on improving existing therapies with the goal of minimizing patient discomfort during treatment. This study seeks to address this compassionate objective. Additionally, Chinese adolescents represent a valuable population for research. While some Chinese researchers have explored the relationship between FD and psychological factors in the general Chinese population, no studies have specifically focused on adolescents. This study will assess FD in Chinese adolescents and include interviews with those within our reach to develop more effective strategies to support this group.

3. Methodology

This study also explores the role of science bases in the science and innovation education of teenagers and examines their efforts to provide extracurricular science education for middle school students. Therefore, any conclusions and interview content should be carefully analyzed and critically evaluated before being accepted as valid.

To answer the research questions, the following methods will be used:

a) Conducting an extensive literature review.

b) Interviews with Chinese adolescents who experience FD under stress and those who do not.

c) Interviewing experts in this field.

3.1 Literature research

After reviewing and summarizing a large body of literature, this research has gained a fundamental understanding of the specific symptoms and diagnostic criteria of FD. It has also compiled various treatment approaches from multiple sources and identified commonly used psychotropic drugs and effective psychotherapy methods for FD treatment.

The references in this study come from authoritative academic platforms, including Google Scholar, which provides free access to a vast collection of scholarly literature; PubMed, a freely searchable database focused on biomedical research, using MEDLINE as its primary source; and ScienceDirect, a full-text database managed by a globally recognized publisher of high-quality academic journals based in the Netherlands. Additionally, other reputable academic sources were consulted, ensuring that all articles referenced in this study originate from credible journals or official websites.

3.2 Interviews with Chinese adolescents

The second interview involved a group of 11 Chinese high school students who experienced varying levels of anxiety during exam periods. The purpose of these interviews was to engage directly with the research population, analyze the topic from the perspective of Chinese teenagers, and gather comprehensive information to consider potential solutions more effectively.

The group consisted of 10 participants—2 boys and 8 girls—of whom 3 had been diagnosed with psychological disorders of varying severity, including depression, anxiety, and bipolar disorder. Most participants were 16 years old when participating the interview, with a few younger than 16. Each student reflected on their most recent major exam, with 4 having taken Cambridge International Examinations Board exams, 4 having taken AP exams, and the remaining 2 having participated in major exams within the Chinese curriculum. Among them, 6 out of 10 reported experiencing stomach symptoms associated with anxiety.

Participants were asked to rate their anxiety levels before the exam, assess the severity of their physical symptoms, explain the sources of their stress and anxiety, and evaluate whether these factors had impacted their test performance. They were also asked to review the methods they had used to alleviate anxiety and determine which strat-

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egies were effective and which were not. Additionally, a separate inquiry was conducted for students who reported having no anxiety or somatization symptoms during exam periods to understand the factors contributing to their mental resilience.

3.3 Expert Interview 1

The first interview invited Dr. Jiang Ping, a vice researcher at the Shanghai Brain Health Science Popularization Center. The purpose of this interview was to gain a more comprehensive understanding of drug therapies proposed for anxiety-related FD and to evaluate their effectiveness and side effects from a professional perspective.

The discussion focused on Dr. Jiang's insights into existing treatments for anxiety-related FD, which she was asked to explain in detail. Additionally, the study explored how anxiety contributes to FD and invited Dr. Jiang to try to suggest strategies for minimizing the pain and discomfort caused by treatment side effects.

3.4 Expert Interview 2

The second interview was conducted with a psychotherapist from a counseling agency in Beijing. While the psychotherapist chose to remain anonymous, his expertise is supported by over 15 years of clinical experience, and he is also a practicing psychiatrist.

The purpose of this interview was to gain a deeper understanding of the mechanisms through which anxiety and emotions influence FD and to explore psychiatric treatment approaches for anxiety-induced FD. The psychotherapist was asked to explain the causes and manifestations of anxiety, provide a basic analysis of relevant neurological factors, and clarify how mood changes impact digestive function. Additionally, he was asked to recommend treatments for anxiety-related FD and discuss strategies to mitigate potential side effects associated with these treatments.

4. Result and discussion

This research aimed to answer three research questions:

a) What is the etiology and causes of anxiety-related FD, and how does it affect Chinese adolescents?

b) What are the advantages and disadvantages of the available treatments?

c) What treatments are recommended?

To answer these questions, findings from expert interviews, insights from Chinese adolescents, and a comprehensive literature review will be synthesized into conclusions and recommendations.

4.1 Analysis of the impacts and etiology

4.1.1 Student interviews

The interviews of Chinese adolescents demonstrate how stressful events affect the incidence of FD. 10 Chinese adolescents were interviewed during a period of anxiety/exam stress. 6 of them reported FD. Table 1 shows the results of students who reported FD. Table 2 shows the results of students who did not have FD.

Table 1. Results for students with FD

Name	Anxiety Score	Physical symptoms scoring > 2	Is FD continuous	Impact on performance	Period	Idea for self-remission
W	37	insomnia, exhaustion, headache, FD, dry mouth, zip mouth, loss of appetite	Y	2 out of 5 negative	comes a week before and immediately ends after tests	mindfulness relief
TB	28	insomnia, FD, loss of appetite	N	both positive and negative, large	comes a day before and immediately ends after tests	hold on to resist pain, eat snacks to relieve FD symptoms
C	38	exhaustion, headache, very fast heartbeat, catch a cold, dry mouth, zip mouth	Y	negative, large	comes a week before and immediately ends after tests	exercising, making plans, mindfulness relief

D	31	insomnia, exhaustion, headache, FD, muscular tension, very fast heartbeat, zip mouth	Y	negative, large, 8 out of 10	comes a month before and will continue for about a day	exercising
M	34	insomnia	Y	can get distracted	comes 2 weeks before and immediately ends after tests	hold on to resist pain
F	29	insomnia, muscular tension, very fast heartbeat, loss of appetite	Y	no effect	comes 3 days before and immediately ends after tests	healthy diet

Keys: "Y" represents "yes", "N" represents "no".
The maximum of the anxiety score is 50.
Table 1 indicates that the six participants generally exhibited high levels of anxiety. In addition to FD, insomnia and exhaustion were the most frequently reported physical symptoms. Their anxiety was often persistent and had a negative impact on academic performance for most individuals. Furthermore, students with FD appeared unable to effectively alleviate their symptoms.

Table 2. Results for students without FD

Name	Anxiety Score	Physical symptoms scoring > 2	Is FD continuous	Impact on performance	Period	Ideas for self-remission
G	34	insomnia, exhaustion, dry mouth	N	no effect	comes a week before, immediately ends	Sleeping and eat many spicy food
L	40	insomnia, exhaustion, headache, zip mouth	Y	large and negative effects	comes 2 weeks before, immediately ends	Order takeaway

Keys: "Y" represents "yes", "N" represents "no".
The maximum of the anxiety score is 50.
The participants in Table 2 also reported high levels of anxiety. Students in this group attempted to alleviate their symptoms by consuming spicy takeaway food, which is not a healthy long-term coping strategy (Chen et al., 2017; Janssen et al., 2018).
Among the students, R and B managed stressful events most effectively. R reported no physical symptoms and attributed her ability to stay calm to completing all projects on time and avoiding last-minute work. She also practiced self-reward by acknowledging her achievements and focusing on her strengths. B, on the other hand, stated that he dislikes the feeling of stress and consciously chooses to reject anxiety when he recognizes it. As a result, he maintains a relatively low stress level. Additionally, his frequent exposure to exams may have habituated him to stressful situations.
The strategies used by these two students may not be universally applicable. R's approach, which involves metacognition, planning, and self-reward, is beneficial and should be taught to students. However, B's method of consciously rejecting anxiety may require training and practice, making it more challenging for most students to adopt.
In conclusion, Chinese students should receive education and training in exam preparation strategies that reduce stress and enhance self-awareness. While the findings of this study may not be fully conclusive, they are supported by prior research. A study on college students demonstrated that exam stress is an effective psychosocial model for inducing somatic symptoms (Zunhammer et al., 2013). Similarly, assessments have shown that test anxiety can negatively impact stomach health during exam preparation, potentially leading to Helicobacter pylori infection, a known contributor to FD (Ali et al., 2022; Choi, 2020; Suzuki & Moayyedi, 2013). Students should be given methods to relieve stress.

4.1.2 Expert interviews

Dr. Jiang stated that while the exact link between GAD and FD remains unclear, several hypotheses have been proposed. The most widely accepted is the monoamine hypothesis, which suggests that during periods of depression and anxiety, the concentration of monoamine neurotransmitters decreases, affecting synaptic transmission.

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Increasing these neurotransmitters can have an antidepressant effect. Specifically, GAD is believed to be closely associated with 5-hydroxytryptamine (5-HT) dysfunction, as parts of the digestive system produce 5-HT, establishing a connection between mood regulation and brain-gut interactions.

In another interview, the Chinese adolescent psychotherapist affirmed that anxiety and FD are definitively correlated. He explained that the stability of an individual's living environment and mental state directly affects digestive system function, which operates under the regulation of the autonomic nervous system.

Existing literature provides multiple explanations for the etiology of FD and its link to anxiety. As summarized in the literature review, FD symptoms are influenced by interactions between the gut, gut microbiota, enteric nervous system, and central nervous system signaling, all of which are affected by mood changes (Mayer et al., 2022). Psychological factors can also alter pain perception (Choi et al., 2018). Psychosocial factors regulate the processing of visceral signals to and from the brain and play a role in FD by this way (Van Oudenhove & Aziz, 2013).

However, the exact mechanism remains a matter of conjecture. Further research is needed to clarify this relationship, and these uncertainties should be effectively communicated to both patients and clinicians.

4.2 Evaluation of existing treatments

According to Dr. Jiang, anxiety-related FD is primarily treated with anti-anxiety medications. Mainstream anti-anxiety drugs include azapirones such as buspirone and tandospirone. Additionally, serotonin-norepinephrine reuptake inhibitors (SNRIs), which act on both 5-hydroxytryptamine (5-HT) and norepinephrine, may also be used. Currently, Venlafaxine and Duloxetine are the only SNRIs prescribed for anxiety.

Research indicates that tricyclic antidepressants (TCAs) are effective in treating intractable FD (Ford et al., 2017; Koduru et al., 2018; Lu et al., 2016; Madisch et al., 2018). However, interviewee Dr. Jiang stated that TCAs are not always used because they are too risky.

The interviewee Chinese adolescent psychotherapist gave a similar response. He explained that buspirone and tandospirone help calm the nervous system by reducing the release of adrenaline and other stress hormones, thereby slowing heart rate.

Because drugs can be risky, non-drug therapies are often sought. Common non-drug therapies include physical therapy and psychological therapy. Interviewee Dr. Jiang introduced that the common means of psychological therapy is to invite psychotherapists to conduct interviews and family therapy.

The so-called physical therapy is the treatment through the current physical means. Physical therapy methods can be briefly summarized as sound, light, electricity and magnetism in four words. Sound refers to vocal therapy; light refers to the improvement of light conditions in the patient's environment; electricity and magnetic refers to MECT, RS, TMS, and other electrotherapy methods. For GAD, biofeedback can be used. It involves training patients to control their stress by being linked into a computer which creates a low stress environment and gives physical feedback. Patients' vital signs such as muscle tension and heart rate are monitored. 'Moreover, lifestyle is the first aspect that GAD patients need to adjust. Healthy habits and exercise are the most essential for patients to live a healthy life.'

The Chinese adolescent psychotherapist recommends mindfulness-based stress reduction. Mindfulness is the conscious awareness of one's physical sensations, such as closing the patients' eyes and let them be mindful of their breathing. After a period of practice, the patients' mind will gradually become relaxed. He also recommended cognitive behavioral therapy (CBT). This helps to find the patient's distorted cognition and gradually correct the patient's thinking mode.

There is much evidence in the literature for the use of psychological therapies for young people with GAD, and for FD itself. Studies have shown that CBT combined with hypnotherapy significantly reduces symptoms (Lacy et al., 2023; Wei et al., 2022). Therapies such as CBT and hypnotherapy can be used alone or combined with other safe alternative medications, and CBT is recognized as an effective and safe non-drug therapy for adolescents with GAD compared with no treatments (James et al., 2020; Szuhany & Simon, 2022; Walter et al., 2020). Better patient engagement with Tele-psychotherapy also worth considering (Watts et al., 2020).

Research indicates that mindfulness therapy, as recommended by a Chinese adolescent psychotherapist, has a temporary effect on Western children and provides limited relief from anxiety in Western adolescents (Odgers et al., 2020). This research believes that psychotherapy has proven effectiveness in treating GAD and FD, but even CBT has its limitations, highlighting the need for more comprehensive and effective therapies.

Once treatment options are established, their side effects should be evaluated in detail. A 2016 study highlighted adverse effects associated with antidepressants in FD patients (Lu et al., 2016). TCAs and SSRIs can lead to dry mouth, drowsiness, and weight gain (Jackson et al., 2010). TCAs are also associated with higher dropout rates, lower tolerance, and increased cardiac side effects (Wang et al.,

2018).

These findings align with responses from interviews. Dr. Jiang mentioned that TCAs could cause serious cardiac side effects, including prolonged Q-T intervals and atrioventricular block, potentially leading to sudden death in severe cases. Therefore, TCAs are no longer recommended as a mainstream treatment.

Dr. Jiang also noted that while the side effects of other psychotropic drugs are less severe than those of TCAs, most still inevitably cause dry mouth and gastrointestinal issues. Some anticholinergic drugs may also lead to constipation. Similarly, the Chinese adolescent psychotherapist mentioned that some patients may experience dry mouth and gastrointestinal side effects, such as nausea associated with anti-inflammatory drugs. Taking medication before meals may cause unexplained nausea or loss of appetite, while some individuals report dizziness or discomfort in the following day. However, the psychotherapist stated that drowsiness is the most common side effect.

Further research on SSRIs and SNRIs indicates that SSRIs can increase suicidal thoughts (Li et al., 2022). Side effects such as sexual dysfunction, bleeding, and hyponatremia are more common in current mainstream SNRIs compared to other classes (Wang et al., 2018). Other side effects of SNRIs include initial anxiety, insomnia, and restlessness, along with potential sexual dysfunction and headaches (Santarsieri & Schwartz, 2015). Compared to SSRIs, SNRIs are more likely to cause nausea, insomnia, dry mouth, and, in rare cases, elevated blood pressure (ibid.).

For non-drug therapies, Dr. Jiang stated that physical therapy may cause some discomfort. While CBT and mindfulness therapy were generally well-tolerated, one study reported side effects in 26% of patients, including increased pain, worsening symptoms, and family tension, with 21% classified as severe (Schermuly-Haupt et al., 2018). Despite this, the significant effectiveness of CBT in treating GAD patients with physical symptoms is undeniable, and it remains among the top treatment options.

4.3 Corresponding suggestions on treatments

When asked how to mitigate treatment side effects, both experts provided similar suggestions. Dr. Jiang mentioned that if drug therapy is necessary, they would first select a small but effective dose to avoid aggravating side effects. The minimum duration for evaluation is one month; if the patient tolerates it well, the dose can be increased. Typically, treatment starts with a single medication, and if ineffective, another drug is introduced, or two drugs may be combined. Current guidelines encourage the "full dose of one drug, full course of one treatment" approach. Patients must take their medications in sufficient quantities over an adequate duration, avoiding continual changes or replacements. The Chinese adolescent psychotherapist emphasized that psychiatrists conduct a pros and cons analysis when establishing treatment plans, weighing the benefits against side effects and considering the patient's tolerance. If anxiety relief is minimal and side effects are severe, doctors may opt for a different medication to alleviate the side effects.

In conclusion, the study suggests that combining drug therapy with non-drug therapy is crucial for achieving significant efficacy, as each type of therapy offers unique advantages. Drug therapy acts quickly and directly on the patient's condition, while non-drug therapies generally have fewer side effects and are often administered with professional guidance, making them safer for patients, even if they work more slowly than medications. This combination significantly enhances the chances of patient recovery. Although patients might experience temporary shortcomings from both therapies, this is preferable to enduring long-term side effects from a single therapy with limited success.

For specific treatment options, this study recommends azapirones (including tandospirone and buspirone) as drug therapy, as these are current mainstream medications with no reported serious side effects, indicating their safety. The recommended non-drug therapy is CBT, as several guidelines affirm its suitability for those with anxiety disorders (James et al., 2020; Szuhany & Simon, 2022; Walter et al., 2020). As mentioned by the psychotherapist, CBT is a step-by-step therapy, allowing patients to monitor their recovery progress intuitively. For instance, a patient might find they could only tolerate a dog standing 10 meters away yesterday, but today they can tolerate one within 9 meters. This convenience is vital for building patient confidence in treatment and can aid their recovery. While some patients report significant side effects, they are generally less problematic than forgoing treatment, provided both parties can address these issues (Schermuly-Haupt et al., 2018).

However, it remains challenging to fully address the side effects associated with existing therapies. Currently, the most effective way to mitigate drug therapy side effects is through careful monitoring of the patient's drug tolerance, beginning with minimal dosages and evaluating their condition before adjusting or switching medications. To prevent patients from experiencing discomfort that impacts their daily lives, doctors should conduct comprehensive assessments before prescribing medications. Additionally, this study suggests that patients should establish a strong trust relationship with their therapists to openly discuss any intolerances to medications, avoiding unnecessary

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suffering caused by concealing their conditions. Doctors should also inform patients in advance of all possible side effects. The same advice applies to patients undergoing non-drug therapy; when discomfort arises, they should promptly communicate with their treatment provider to adjust the treatment plan and prevent further pain.

5. Evaluation

This study highlights several noteworthy aspects. First, it involved two authoritative experts who provided insights into the research topic, identifying gaps in the existing literature and updating the status of GAD treatment. Second, the study focused on adolescents, filling a significant gap in this area. Given their vulnerability and developmental stage, adolescents warrant special attention and protection. Additionally, by synthesizing the opinions of the interviewed experts and secondary literature, the study made recommendations for both drug and non-drug therapies, serving as a reasonable reference. Lastly, the study was conceived with a caring perspective, suggesting ways to mitigate treatment side effects and prioritizing patient health for better recovery and safety.

However, limitations are inevitable. Firstly, the interviews with students have several limitations. Ten people is a small sample, so the results may not be generalizable; the participants were the most accessible resources (classmates and friends), so they may not be representative; other unknown factors may have affected participant responses to stress, such as general health or other life events. Whether any of them had a history of FD also remains unclear. Secondly, while both interviewees are experienced psychiatrists, they are not leading researchers, which may introduce unrecognized biases into their responses. Furthermore, there is limited research discussing their theories, and much of the evidence presented in this research requires further investigation. Additionally, the study did not improve upon the drugs currently used to treat anxiety-induced FD, only suggesting effective risk-avoidance measures, which also merits further exploration. The limitations in the selection of student interviewee groups are worthy of reflection.

6. Conclusion

This research successfully addresses all the research questions. Most Chinese adolescents experience stress-induced anxiety, with FD being one of its somatic symptoms. Many adolescents lack awareness of effective stress relief methods and need education in this area. The monoamine hypothesis remains the most reliable explanation for the mechanism linking GAD to FD. Since FD caused by anxiety does not occur in isolation, it can improve with GAD treatment. The recommended drug therapy is azapirone (buspirone and tandospirone), and the non-drug therapy recommended is CBT for Chinese adolescents with GAD. The approach to managing side effects remains an area for exploration. Establishing a strong doctor-patient trust relationship is essential, enabling tailored risk assessments and treatment plans that prioritize risk avoidance and benefit maximization. Doctors should inform patients of potential side effects, allowing them to discontinue medications if necessary. Additionally, the commonly utilized "full dose of one drug, full course of one treatment" strategy is an effective means of minimizing patient side effects. The specific pathogenesis of FD caused by anxiety disorders is still unclear, and many plausible mainstream hypotheses require further research, indicating that future researchers in this field have much work ahead.

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