

The brain-gut connection in Traditional Chinese Medicine.

A ligação cérebro-intestino na Medicina Tradicional Chinesa.

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Abstract: This paper investigates the bidirectional communication between the brain and the gut, exploring its implications for mental and gastrointestinal health. It highlights the complex network of anatomical, endocrine, metabolic, and immunological communication that mediates this interaction. Traditional Chinese Medicine, characterized by a holistic view of health, recognizes the interdependence between emotions and biological systems. Studies reviewed and reported in this work show that Traditional Chinese Medicine interventions, such as acupuncture, herbal medicine, and qigong exercises, can reduce symptoms of anxiety, depression, and functional gastrointestinal disorders. Additionally, Chinese herbal medicine shows potential in regulating the gut microbiota and modulating neurotransmitters associated with mental health. Furthermore, the historical use of techniques like faecal transplantation underscores the ancestral Chinese knowledge of the influence of microbiota on mental health. In summary, this study emphasizes the importance of an integrative approach to brain-gut communication in understanding and treating gastrointestinal and mental disorders, promoting synergy between conventional medicine and Traditional Chinese Medicine to improve patients' overall health.

Keywords: Brain-gut connection, Traditional Chinese Medicine, Acupuncture, Herbal medicine, Qigong.

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Resumo: Este trabalho investiga a comunicação bidirecional entre o cérebro e o intestino, explorando as suas implicações na saúde mental e gastrointestinal. Destaca-se a complexa rede de comunicação anatómica, endócrina, metabólica e imunológica que medeia essa interação. A medicina tradicional chinesa, caracterizada por uma visão holística da saúde, reconhece a interdependência entre as emoções e os sistemas biológicos. Estudos revistos e relatados neste trabalho mostram que intervenções da medicina tradicional chinesa, como acupuntura, fitoterapia e exercícios de chikung, podem reduzir sintomas de ansiedade, depressão e distúrbios gastrointestinais funcionais. Além disso, a fitoterapia chinesa demonstra potencial na regulação da microbiota intestinal e na modulação de neurotransmissores associados à saúde mental. Também, a utilização histórica de técnicas como o transplante fecal ressalta o conhecimento ancestral chinês sobre a influência da microbiota na saúde mental. Em síntese, este estudo destaca a importância da abordagem integrativa da comunicação cérebro-intestino na compreensão e tratamento de distúrbios gastrointestinais e mentais, promovendo uma sinergia entre a medicina convencional e a medicina tradicional chinesa para melhorar a saúde global dos pacientes.

Palavras-chave: Ligação cérebro-intestino, Medicina Tradicional Chinesa, Acupuntura, Medicina erval, Chikung.

1. Introduction

There has been growing attention to the bidirectional brain-gut communication ¹. This network connects the central and enteric nervous systems, including anatomical, en-

doctrine, humoral, metabolic, and immunological communication pathways². These connections allow the brain to influence intestinal function and the gut to affect mood and cognition³.

This perspective opens doors to a multitude of hypotheses for understanding the development of certain diseases, as well as for the refinement and development of new treatments.

For example, increasing attention has been given to the characteristics of Traditional Chinese Medicine in improving depression through the regulation of the gut-brain axis and microbiota⁴. In fact, since around 500 BC, faecal microbiota transplantation has been recorded in Traditional Chinese Medicine⁴⁻⁷ for the treatment of various gastrointestinal, nervous system, skin, and even gynaecological diseases⁸. One of the most well-known methods is the "gold juice," whose production process involves the fermentation and sedimentation of faeces, taken for detoxification and the treatment of severe fever⁷.

This study aims to explore the brain-gut connection according to both conventional and Traditional Chinese Medicine. The goal is to understand the physiological mechanisms associated with this phenomenon and its implications for mental health, particularly anxiety and depression. Additionally, it seeks to establish which Chinese Medicine therapies are supported by scientific evidence.

2. The brain-gut connection

As mentioned before, the brain-gut connection is a bidirectional communication network¹ linking the central and enteric nervous systems through several pathways². Scientifically accepted, these connections allow the brain to influence intestinal function and the gut to influence mood and cognition³. Figure 1 illustrates this dynamic.

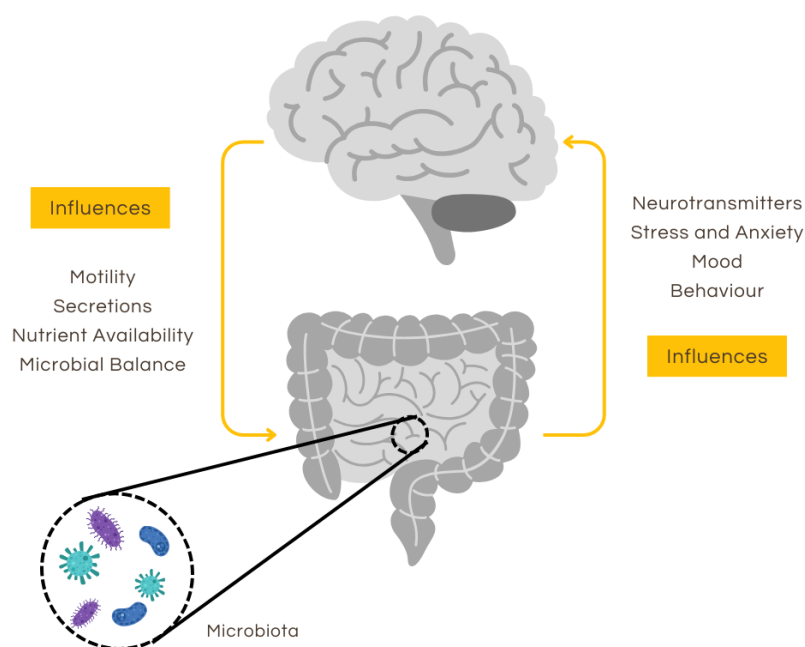


Figure 1. Brain-gut connection and its interactions.

Understanding and supporting the brain-gut connection is crucial for maintaining optimal health and addressing various health conditions⁹⁻¹³. It is, therefore, underscored the importance of a holistic approach by integrating mental and physical health in medical and therapeutic practices.

3. Implications for mental health

An imbalance in the brain-gut connection can lead to significant implications for mental health through various mechanisms. For example, it is widely accepted that functional alterations in serotonin 5-HT_{2A} receptors are associated with several psychiatric disorders such as schizophrenia, depression, and substance abuse ¹⁴. The activity of 5-HT_{2A} receptors appears to be related to enteric functions ¹⁵ and may even be involved in certain intestinal inflammatory processes ¹⁶.

To further explore this seemingly evident and representative connection of the brain-gut axis, it is important to mention that 95% of serotonin receptors are produced in the intestine, where they also play a crucial role in regulating the enteric nervous system, immune responses, and epithelial integrity ^{17,18}.

In addition to the aforementioned, the intestinal microbiota also has the ability to directly and indirectly affect the emotional and cognitive centres of the brain ³. Indeed, changes in the composition and quantity of intestinal microbiota are associated with alterations in the brain-gut communication systems ¹⁹. Depression, anxiety, and other mental disorders are examples of conditions linked to gastrointestinal disturbances and changes in intestinal microbiota ²⁰⁻²⁶.

4. Traditional Chinese Medicine and the brain-gut connection

Traditional Chinese Medicine is considered an extremely relevant milestone of Chinese civilization as a medical science with thousands of years of history ²⁷. This medical system was developed empirically over various dynasties, both as a means to promote a healthy lifestyle and to combat diseases ²⁸. Archaeological findings suggest that its techniques may have originated between 2000 BC and 6000 BC ^{29,30}.

Nowadays, Traditional Chinese Medicine has been utilized worldwide and has evolved into a complementary medicine to Western medicine, capable of enhancing and improving the outcomes of the latter ³¹⁻³⁴.

Because Traditional Chinese Medicine is a holistic medicine that views health as a state of cooperative and interconnected functioning of various biological systems ³⁵, the brain-gut connection can be understood according to several processes.

At its core, Traditional Chinese Medicine presents a connection between emotions (or mental processes) and different systems ³⁶. These systems are categorized and represented by elements (fire, earth, metal, water, and wood) and their respective physiological processes by organs. Table 1 summarizes these associations according to various traditional and classical theories.

Table 1. Associations between elements, their respective organs, and emotions according to Traditional Chinese Medicine.

| Element | Emotions/Mental Processes | Organs and viscera/processes |
|---------|----------------------------------|------------------------------|
| Wood | Anger | Liver and Gallbladder |
| Fire | Joy/Euphoria | Heart and Small Intestine |
| Earth | Overthinking/Repetitive Thinking | Spleen and Stomach |
| Metal | Sadness and worry | Lung and Large Intestine |
| Water | Fear and Shock | Kidney and Bladder |

Thus, it can be understood the importance of emotions in other systems, particularly in the gastrointestinal system. The association of emotions with organs such as the small and large intestines, liver and gallbladder, stomach, and spleen highlights the significance of specific mental states in the functioning of these organs and their respective systems. Traditional Chinese Medicine also views these interactions as bidirectional among the various factors. Therefore, it can be stated that the brain-gut interaction is present in Traditional Chinese Medicine theory under a unique perspective.

5. Physiological mechanisms in the context of Traditional Chinese Medicine

As mentioned, the brain-gut interaction can be explained through various interactions among different systems identified in Traditional Chinese Medicine. Linking emotions (or mental processes) to physiological functions, "excessive thinking" or "rumination" is associated with the Earth phase ³⁶. According to these authors' theory, this "excessive thinking" may be related to the development of anxiety and depression. Additionally, in Traditional Chinese Medicine, the Earth element is associated with the Spleen-Pancreas and Stomach and plays an important role in the assimilation and digestion of food ³⁷. Thus, we can observe an interaction between the mental dimension and digestive processes, as Chinese medicine views all physical and mental processes as dependent on a state of balance among them.

Similarly, the Metal element is associated with the large intestine. According to some theories, "worry" affects the large intestine and may be involved in the development of anxiety and depression ^{36,37}. Additionally, the roles of the Wood and Fire elements may be crucial in this process, as their systems also have associations with various physiological processes related to digestion, as represented in Table 2.

Table 2. Association of different organs with physiological processes according to conventional and Chinese medicine regarding digestion.

| Element | Organ/System | Western Medicine | Traditional Chinese Medicine |
|---------|-----------------|--|---|
| Wood | Liver | Produces bile and processes and purifies blood containing newly absorbed nutrients from the digestive process. | Digests food through regulation of Qi flow and blood storage. Ensures smooth Qi flow, essential for food movement along the digestive tract. Imbalance in Liver Qi can lead to symptoms like abdominal distension, indigestion, and constipation. |
| | Gallbladder | Stores and concentrates bile produced by the liver and releases it into the small intestine to aid in fat digestion. | Bile is considered important for free Qi circulation in the body, promoting overall health and well-being. An imbalance in bile production or circulation can lead to symptoms like indigestion, abdominal distension, irritability, and skin issues. |
| Fire | Small Intestine | Absorbs nutrients from digested food, including proteins, fats, carbohydrates, vitamins, and minerals, for use by the body. Responsible for secreting important enzymes and hormones for digestion and metabolic regulation. | Plays a crucial role in filtering impurities and distributing Qi throughout the body. |

Regarding the assimilation of food itself, tryptophan is an essential amino acid found in certain foods, serving as a precursor for various metabolites, specifically kynurenine and serotonin ³⁸. Kynurenine plays an important role in the development of some neurological diseases ^{39,40} and, in turn, serotonin has been associated with depression ⁴¹. Thus, according to experimental evidence produced in recent decades ^{38,42-45}, there is a clear link between the absorption capacity of tryptophan and an individual's mental state.

Therefore, based on Traditional Chinese Medicine, it is possible that the absorption capacity of food by the Earth element (the processes and physiological functions associated with this element) can lead to imbalances associated with anxiety and depression. In reverse, emotional imbalances can also affect the functional capacity of this element, thus describing what can be understood as the brain-gut connection.

However, other practical examples describing these associations between mental state and gastrointestinal function are detailed in the literature. For instance, chronic diarrhoea or constipation seems to be related to depression ⁴⁶. Additionally, symptoms of anxiety and depression appear to be related to the severity, persistence, and response to treatment of gastrointestinal diseases ⁴⁷⁻⁴⁹.

Based on current scientific knowledge, it can be stated that the perspective of Traditional Chinese Medicine successfully describes mind-body interactions, and, in line with the topic of this work, the brain-gut interaction.

6. Evidence of Traditional Chinese Medicine Techniques

This work also aims to assess the evidence of Traditional Chinese Medicine techniques based on the brain-gut connection. This section will report various studies that may help understand how Traditional Chinese Medicine can act and contribute to improving dysfunctions within this brain-gut dynamic.

To evaluate the clinical efficacy of acupuncture treatment for depressive symptoms associated with diarrhoea-predominant irritable bowel syndrome, Meng ⁵⁰ conducted an experimental study with seventy patients diagnosed with diarrhoea-predominant irritable bowel syndrome and concomitant depressive symptoms. These patients were randomly assigned to a control group and an experimental group. The control group received oral pinaverium bromide tablets (an antispasmodic drug), while the experimental group underwent acupuncture treatment focused on regulating the liver and spleen. Both groups underwent a 4-week treatment regimen. After the treatment, statistically significant differences were observed between the two groups in terms of abdominal pain severity, abdominal pain frequency, defecation satisfaction, and overall symptom scores. Depression index scores in the experimental group showed a significant decrease, with improvements significantly superior to those in the control group. Thus, considering the results of this study, acupuncture appears to be a promising therapy for significantly alleviating gastrointestinal and depressive symptoms in individuals with diarrhoea-predominant irritable bowel syndrome.

Based on the premise that there has been a growing body of clinical research suggesting the potential of acupuncture-related therapies in the treatment of irritable bowel syndrome (where the psychological well-being of the patient is crucial), another study conducted by Wang, Shi ⁵¹ aimed to evaluate the mental health status, efficacy, and safety of different acupuncture-related techniques for individuals with diarrhoea-predominant irritable bowel syndrome.

In this review study with meta-analysis, the authors searched seven databases for randomized controlled trials (RCTs) examining acupuncture-related therapeutic techniques for the population in question. The study analysed 24 studies with a total of 1,885 patients and covered eight types of acupuncture and related therapies. The results revealed that combined therapies (as a complement) were more effective than the use of Western medicine alone in reducing the Self-Rating Anxiety Scale and Self-Rating Depression Scale scores. Moxibustion was superior to placebo in reducing Hamilton Anxiety Scale scores while surpassing all other interventions in reducing Hamilton Depression Scale scores.

Additionally, combined techniques demonstrated superior efficacy compared to Chinese pharmacotherapy. Moxibustion, acupuncture, combined techniques, and electroacupuncture also achieved very positive results in various other indicators. Therefore, the authors suggested that moxibustion, acupuncture, combined techniques, and electroacupuncture demonstrate efficacy in reducing anxiety and depression among individuals with diarrhoea-predominant irritable bowel syndrome, with a high safety profile. Furthermore, combining acupuncture-related treatments with other therapies provides an overall superior benefit.

Another study ⁵², aimed at systematically evaluating the clinical efficacy and safety of acupuncture in treating emotional symptoms in patients with Functional Gastrointestinal Disorders. This study analysed RCTs published up to July 31, 2021. These trials were collected from three English-language databases (PubMed, the Cochrane Central Register of Controlled Trials, and EMBASE) and five Chinese-language databases (China National Knowledge Infrastructure, Wanfang, VIP, Chinese Biomedicine, and TCM Literature Analysis and Retrieval Database). This study included RCTs comparing acupuncture with sham acupuncture and pharmacotherapy. Results from a total of 2,151 patients from 24 RCTs were included in the analysis.

When compared with sham acupuncture, acupuncture was not significantly better at reducing symptoms of anxiety and depression. However, compared with pharmacotherapy, acupuncture was significantly better at reducing symptoms of anxiety and depression. Therefore, the authors' meta-analysis suggests that acupuncture may be more effective in reducing emotional symptoms in patients with Functional Gastrointestinal Disorders compared to pharmacotherapy. Nonetheless, the underlying mechanism—whether related to the placebo effect, or specific or nonspecific effects of acupuncture—remains uncertain.

On this topic, as stated by Rodrigues, Santos ³⁵, it is important to understand that the difficulty of effectively conducting placebo-controlled trials is a commonly observed limitation in studies involving Traditional Chinese Medicine. Establishing a placebo control for practices such as acupuncture or qigong is generally challenging, and methods and evaluations should be adjusted accordingly ^{53,54}. Inadequate sham interventions can not only lead to confusing and misleading results but also to an underestimation of the techniques and a bias against them ⁵⁵.

Chan, Wong ⁵⁶ conducted an RCT study to compare the effects of a Dejian Mind-Body Intervention based on Chinese Chan with Cognitive Behavioural Therapy in reducing depressive symptoms in patients diagnosed with depression. Seventy-five participants diagnosed with major depressive disorder were assigned to three groups, either receiving 10 sessions of Cognitive Behavioral Therapy, Dejian Mind-Body Intervention, or placed on a waitlist. Pre- and post-study measurements included antidepressant treatment records, assessments by psychiatrists (blinded to the experimental design), self-assessments of mood, and performance in a cognitive test of concentration ability. Both the Cognitive Behavioral Therapy and Dejian Mind-Body Intervention groups showed significant reductions in overall depressive symptoms after the intervention. Additionally, the Dejian Mind-Body Intervention group, but not the Cognitive Behavioral Therapy or waitlist groups, demonstrated a significant decrease in antidepressant usage and significant improvement in specific depression-related symptoms such as concentration difficulties and overall sleep quality. Furthermore, only this group achieved significant improvements in gastrointestinal health issues, which is relevant to the theme of this study and suggests the hypothesis that mental benefits may also have gastrointestinal repercussions.

The Dejian Mind-Body Intervention emerged based on encouraging evidence regarding the use of techniques such as qigong and tai chi for treating depression. Developed by Chan ⁵⁷ according to the medical principles of the Shaolin Temple, this intervention consists of psychosocial education, mind-body exercises, and dietary modification ⁵⁷. An RCT demonstrated the positive effects of this intervention on improving mood among individuals reporting depressive symptoms, as well as enhancing certain aspects of their physical health ⁵⁸. Other studies have also suggested that this intervention is effective in improving cognitive functions and behavioural problems in patients with developmental and acquired disorders ⁵⁹⁻⁶¹.

Another study employed electrophysiological methods to measure electro-neural activities associated with the Dejian Mind-Body exercises ⁶². The results showed that the Passive Dan Tian Breathing technique induced a relaxed and calm state of mind, reflected by increased alpha asymmetry, whereas Active Dan Tian Breathing induced an attentive state of mind, reflected by increased theta coherence. These findings suggest a possible

explanation for its therapeutic effect in reducing stress and improving attention in individuals.

Yang, Duan ⁶³ conducted a study utilizing qigong techniques with the aim of evaluating the effects of a traditional Chinese qigong exercise on depression and quality of life in gastrointestinal cancer patients undergoing chemotherapy and at high risk of depression. In this preliminary RCT, 80 gastrointestinal cancer patients undergoing chemotherapy and at high risk of depression were randomly assigned to either an intervention group or a control group. Participants in the intervention group performed qigong exercises five times a week and received conventional treatment, for 4 weeks, while participants in the control group received only conventional treatment. The results showed that compared to the control group, the intervention group reported significantly lower depression scores, fewer negative thoughts, and significant improvements in overall health status and physical, emotional, cognitive, and social functions after the intervention.

Post-treatment scores for all symptoms in the intervention group were significantly lower than those in the control group, except for financial difficulties. There were no significant differences observed in the occurrence of adverse side effects between the two groups. Thus, this qigong exercise may be beneficial in reducing depression, decreasing negative thoughts, and improving the quality of life in gastrointestinal cancer patients undergoing chemotherapy. Although this study does not directly demonstrate a relationship between the brain and the gut (as studied in the present work), it underscores the connection between severe gastrointestinal problems and their impact on mental health, as well as the importance of mental health for the quality of life of patients with serious gastroenterological conditions.

With the aim of evaluating the effects of an herbal mixture of *Boswellia carterii*, *Zingiber officinale*, and *Achillea millefolium* on symptom severity, anxiety, and depression in patients with irritable bowel syndrome, Kazemian, Toghiani ⁶⁴ conducted a clinical study with sixty patients. These patients were divided into two groups and assessed at baseline, 1 month, and 3 months using the Irritable Bowel Syndrome Severity Scoring System, as well as the quality of life and anxiety and depression scales. The results showed a decrease in average scores for severity and frequency of abdominal pain, abdominal distension score, and depression and anxiety scores in patients receiving the herbal medication, whereas changes in these variables in the control (placebo) group were not statistically significant. The use of this herbal combination also showed benefits in the quality of life of patients, although not statistically significant. Therefore, the results of this study suggest that a mixture of *Boswellia carterii*, *Zingiber officinale*, and *Achillea millefolium* may be effective in reducing symptoms of irritable bowel syndrome and associated depression and anxiety.

Indeed, *Boswellia carterii* (frankincense) is an anti-inflammatory herbal medication without effects on increasing acids in the gastrointestinal system. The extract of this plant, especially boswellic acid, has effects on antibody production and cellular immunity. It is also a potent inhibitor of lipoxygenase, which inhibits the production of leukotrienes ⁶⁵. Studies on this plant report that it has antidepressant effects, in addition to its protective effects in patients with Alzheimer's disease ^{65,66}. Furthermore, it also appears to have positive effects on inflammatory diseases, including rheumatoid arthritis, allergic reactions, asthma, chronic bronchitis, psoriasis, and multiple sclerosis ⁶⁷.

Furthermore, *Achillea millefolium* (yarrow) is another herbal medication containing glycoflavonoid components that are used in the treatment of arthritis, gastritis, asthma, and liver diseases in ancient medicine ⁶⁸. Studies on this plant in animal models and also in patients with anxiety disorders have shown that it has anxiolytic effects ^{69,70}.

On the other hand, *Zingiber officinale* (ginger) is a plant from the Zingiberaceae family with antioxidant components and antibacterial and antifungal effects, stimulating the immune system ^{64,71}. Studies on the effects of this plant have shown that the methanolic extract of *Zingiber officinale* can reduce symptoms of depression and that Zingiberaceae can be used in depression treatment as an effective and safe medication ^{72,73}. Ginger also

has a gastric protective action⁷⁴, which can strengthen the intestinal barrier and normalize levels of short-chain fatty acids in the intestine⁷⁵. Based on this information and the processes described earlier in this work, it is possible to propose that ginger, through its gastrointestinal benefits, may help maintain microbiota balance and reduce inflammation levels in the intestine, thereby facilitating serotonin production and improving mental health.

Following the discussion above, Li, Xu⁴ aimed to summarize the role that intestinal microbiota plays in depression, highlight potential regulatory targets and elucidate the antidepressant mechanisms of Chinese phytopharmacology through the regulation of intestinal microbiota. To achieve this, these authors conducted a systematic review of 256 clinical trials and pharmaceutical studies published up to June 2022. The research was conducted across eight electronic databases (Web of Science, PubMed, SciFinder, Research Gate, ScienceDirect, Google Scholar, Scopus, and China Knowledge Infrastructure), following PRISMA criteria, using search terms "traditional Chinese medicine," "depression," and "intestinal microbiota."

According to the authors and various studies, Chinese herbal preparations and the main bioactive components of traditional Chinese materia medica have effects similar to antidepressants, improving neurotransmitter levels⁷⁶, bile acids, and short-chain fatty acids^{77,78}, brain-derived neurotrophic factor (BDNF), kynurenine, and cytokines through the regulation of intestinal microbiota. Therefore, it is possible to suggest that Chinese phytotherapy may be safe and effective in treating depression through the gut-brain axis, potentially offering a new therapeutic approach.

Additionally, based on the research of Du, Kuang⁸, Traditional Chinese Medicine has had specific techniques for manipulating the microbiota for over 1500 years. A clear example is the use of faecal matter, which besides all its applications as a treatment for gastrointestinal problems, was also indicated for mental health issues (Table 3).

Table 2. Association of different organs with physiological processes according to conventional and Chinese medicine regarding digestion.

| Animal species | Form | Traditional uses | References |
|--|-----------------|---|------------|
| <i>Felis ocreata domestica</i> Brisson | Processed feces | Manic psychosis or madness | 79,80 |
| <i>Upupa epops</i> L. | Processed feces | Psychopathy | 81,82 |
| <i>Myotis mystacinus</i> Kuhl | Processed feces | Psychosis and epilepsy | 80 |
| <i>Physeter macrocephalus</i> L. | Dried feces | Neurasthenia, memory loss, and psychological impotence | 80 |
| <i>Passer montanus</i> L. | Dried feces | Manic psychosis or madness | 80 |
| <i>Vulpes vulpes</i> L. | Dried feces | Psychopathy and epilepsy | 80,81 |
| <i>Canis lupus</i> L. | Processed feces | Psychopathy and bloating | 81,82 |
| <i>Bubo bubo hemachalana</i> Hume | Processed feces | Psychopathy and epilepsy | 80-82 |
| <i>Corvus corax</i> L. | Processed feces | Bromhidrosis, epilepsy, cough, and psychopathy | 80,82 |
| <i>Canis lupus familiaris</i> L. | Processed feces | Psychopathy and bloating; Syphilis, psoriasis, and anthracnose (external use) | 80-82 |
| <i>Tetrao urogalloides</i> Middendorf | Dried feces | Psychopathy and bloating | 81 |

These authors also suggest that studying the mechanisms of action of these products on the intestinal microbiota and signalling pathways mediated by receptors could be advantageous⁸.

Therefore, and as discussed in this topic, it is possible to state that Traditional Chinese Medicine has a diverse range of techniques capable of regulating the gut-brain axis and promoting mental and gastrointestinal health as an interdependent process

7. Final remarks and conclusions

Research into the bidirectional communication between the brain and the gut has unveiled a complex network of interactions that influence not only intestinal function but also mood, cognition, and mental health.

From the perspective of Traditional Chinese Medicine, this relationship is understood through a holistic approach that considers the interconnectedness of emotions, organ systems, and physiological processes. Organs and elements in TCM are associated with different emotions and functions, and emotional imbalances can directly affect gastrointestinal function, and vice versa. Thus, Traditional Chinese Medicine offers a distinct view of the gut-brain connection, integrating mental and physical factors as interdependent.

Within the realm of Traditional Chinese Medicine, various techniques have been studied for their effectiveness in regulating the gut-brain axis and improving mental and gastrointestinal health. Clinical studies have shown promising results for treatments such as acupuncture, qigong, herbal medicine, and moxibustion, among others. These therapies have proven effective in reducing symptoms of anxiety, depression, and gastrointestinal disorders, often surpassing conventional pharmacotherapy outcomes.

Furthermore, Chinese herbal medicine has been extensively studied to understand its effects on the gut microbiota and its influence on neurotransmitters, neurotrophic factors, and cytokines associated with depression. TCM also has a long history of manipulating the intestinal microbiota, including the use of faecal matter, which demonstrates an early understanding of its importance for mental health.

In summary, the findings of this work suggest that traditional Chinese medicine offers a valuable approach to understanding and treating disorders of the gut-brain axis, promoting an integrated view of mental and gastrointestinal health. Accumulated scientific evidence highlights the potential of these therapies as complements to conventional treatments, offering a holistic and interdisciplinary perspective for promoting physical and emotional well-being. More research is warranted in this field.

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