1. INTRODUCTION

Ayurveda literature defines health as the balanced state and functioning of physical attributes such as *Dosha-Dhatu-Mala* and *Agni* and mental factors such as *Aatma-Indriya-Mana*. This shows the intricate working of different anatomical and physiological features of the body to remain in the state of health. Among these attributes, Ayurveda classics have given great importance to the condition of *Agni* as the deciding factor for determining health or sickness.

According to Ayurvedic literature, the domain of *Agni* cannot be restricted to any specific organ system. It exists in and influences the whole body in one way or another. *Agni* is the factor responsible for all the metabolic activities of the body. It plays a role in any and all chemical transformations that happen in the body, from breaking down of food products during digestion due to the influence of enzymes to the formation of proteins due to transcription and translation of mRNA. In this aspect, Ayurveda has classified *Agni* into 13 types: One *Jatharagni*, five *Bhootagnis*, and seven *Dhatwagnis*. Grossly speaking, the *Agni* that is located in the gastrointestinal tract and is responsible for initial digestion of the consumed food products is known as the *Jatharagni*. Five *Bhootagnis* are responsible for the metabolism of five *Mahabhutas* present in the food. Finally, seven *Dhatwagni* are responsible for the formation of seven *Dhatus* as well.
Agni is further classified into 4 types on the basis of Dosha influence. If the Tridosha is in balanced state, then Agni is in Sama (balanced) condition. This Agni is the best for proper digestion as well as other metabolic activities. However, when the Doshas are in unbalanced condition, the Agni is also unbalanced. When Vata Dosha is predominant, Agni is in Vistama state. That means the strength of Agni is sometimes too high and sometimes too low which causes irregularities in digestion and metabolism. When Pitta Dosha is predominant, then there is the condition of Tikshnagni, i.e., the digestive fire is too strong. In this state, anything consumed by the person is easily digested and the person is in a constant state of hunger. When Kapha Dosha is increased, the Agni is Manda, i.e., too slow. The digestive fire is so weak that the person cannot digest any food.[7] Ayurveda deems Mandagni as the root cause of all the diseases. The importance of Mandagni can also be justified by the fact that Kaya Chikitsa, a branch of Ayurveda, is completely dedicated to the treatment of Agni [Figure 3].

Yoga, classically, has been described for the attainment of the ultimate target of human existence, i.e., union with the universal consciousness, also known as Moksha.[8] However, the pathway of attaining Moksha is very tough and is often hindered by the unhealthy condition of physical and mental body. Hence, Yogic literature also gives importance to maintaining proper state of physical body through its practices so that the body is fit for the ultimate practice of Samadhi. Yoga is one of such treatment modalities that strengthens the body and mind and helps in the management of gastrointestinal disorder.

1.1. Objectives
In this article, the important classical literature of Hatha yoga has been referred to collect and compile the list of classical Yogic practices that have been directly referenced to improve the Agni or to be the treatment of gastrointestinal disorders.

2. MATERIALS AND METHODS
Popular texts of Hatha Yoga such as Hatha Yoga Pradipika, Hatha Ratnavali, and Gheranda Samhita were critically reviewed and analyzed. Only those Yogic procedures that have direct indication for Agni Deepana and for gastrointestinal disorders have been included.

3. RESULTS
Hatha Yoga is one of the streams of Yoga that highly focuses on the physical aspect of Yoga practices for the preparation of the body for the practice of the higher form of yoga, i.e., Raja Yoga. Similar to Patanjali’s Raja Yoga, Hatha Yoga also contains the components of Astanga Yoga. However, the uniqueness of Hatha Yoga comes in the form of other physical practices that have not been considered as part of Raja Yoga. Although it contains all eight components of Raja Yoga, it is not known Astanga Yoga but as Sapta Yoga as in Gheranda Samhita of Maharsi Gheranda.[9][10] The seven components of Hatha Yoga include Shatkarma, Asana, Pranyama, Mudra, Pratyahara, Dhyana, and Samadhi. Among these, Shatkarma, Asana, Mudra, and Pranayama are primarily bodily practices meant for cleansing and stability of the body and preparation of the body for more tough practice of Raja Yoga. Among these forms of practices, some have direct indication in gastrointestinal disorders while some are said to have the function of Agni Deepana.

3.1. The Major Causes of Deranged Agni According to Ayurveda
According to Ayurveda, the main cause of unhealthy gut or vitiated Agni is considered to be the unhealthy lifestyle, i.e., unhealthy dietary regimen, sedentary lifestyle, irregularities in the daily routine, and disturbed circadian rhythm. Adhyasana (overeating), Vishamashana (irregularities in the amount of consumed food), Guru (heavy, difficult to digest)-Atisnigdha (unctuous) food, etc., which are becoming very common in today’s scenario lead to Ajirna and Mandagni. Similarly, sedentary lifestyle, Asya-Sukham, Swapna-Sukham leads to increase in Kapha Dosha and Medo-Dhatu which causes Mandagni. Irregularities in daily routine and disturbance in the circadian rhythm lead to imbalance in the hormonal and metabolic system of the body which can be considered as the Dhatugata Mandagni. Another important factor to consider while discussing the health of Agni is stress and other associated mental factor. In Ayurveda, clear references can be found which depict the effect of heightened negative emotions on the Agni as described by Acharya Charaka while Agni in Vimana Sthana chapter 2. According to him, eating with negative emotions such as Moha, Lobha, Krodha, Chinta, Bhaya, and Shoka leads to indigestion of even the Pathya food leading to the formation of Ama[11] (a mixture of partially digested and indigested food product which later on becomes the cause of Mandagni and other diseases). The external agents such as Krimi are also considered by Ayurveda to be the causative factor of unhealthy gut and gastrointestinal disorders.

There is cause and effect association between negative emotions and stress. Constant exposure to stressors leads hyperactivation of stress response from amygdala and hypothalamus which affects all the systems of the body. As a result, various stress-related disorders such as irritable bowel syndrome, eating disorders, anorexia, peptic ulcer, and inflammatory bowel diseases are increasing day by day.

3.2. Management Principles
For the management of any disorders, Nidana Parivarjan has been described as the first line of treatment.[11] In another context, three types of treatment modalities have been explained: (a) Treatment modalities using different rituals, crystals, chanting, sacrifices, etc., (Daivavyapashraya); (b) treatment using drugs and therapies (Yuktivyapashraya); and (c) treatment that increases the willpower (Sattvavajaya).[12]

If the practical approach is considered, the disease can be managed by removing the underlying cause or by making the body and mind strong enough to fight against the causative factors [Figure 4].

Table 1 shows yogic approach in the management of various gastrointestinal disorders in classical text.

Table 2 shows that apart from this indication, there are direct references to the practices Agnideepana (enhance the Agni).

4. DISCUSSION
Ayurveda has considered Mandagni as the root cause of all the diseases, especially the gastrointestinal disorders. There may be various reasons behind Mandagni like unhealthy lifestyle. The current haphazard lifestyle adversely affects the circadian rhythm. Disturbances in the
circadian rhythm cause disturbances in the hormonal system of the body which in turn leads to different metabolic disorders. These metabolic disorders can be regarded as the by-product of Vikriti Agni as Ayurveda considers all the metabolic actions to be the function of Agni. Hence, for proper management of gastrointestinal disorder, the proper treatment of Mandagni is needed.

In classical Yoga literature, there are numerous practices that focus primarily on the physical body. Practices such as Asana, Mudra, and Shatkarma are meant for the cleansing and strengthening of the body to prepare the body for the ultimate target. Apart from cleansing and strengthening, these yogic practices also have the effect of stretching, stabilizing, and relaxing the body. There are many studies that show the direct effect of Yogic practices on the hypothalamus-pituitary-adrenal (HPA) axis of the body. This HPA axis is very important in maintaining the metabolic balance. The complete physical function of the body as well as its homeostasis depends on the proper functioning of this axis. This means balanced HPA axis led to proper secretion of hormones and enzymes, which in turn means proper digestion, absorption, and assimilation. Hence, it can be concluded that the health of Agni depends on the HPA axis.

Another factor to be considered while discussing the probable mode of action of Yogic procedure is the simple physicality of the practice. In a very crude sense, Yoga practices are basically physical exercises with coordinated breathing and acute awareness. Vyayama is considered as one of the best methods for Agni Deepana. Hence, Yoga practices also give benefits similar to that of the exercise. Different yogic postures stimulate better health and functioning of different organs through different pathways.

Some practices, such as Matsyendra Asana, Mahamudra, and Bhashrika Pranayama, involve the movement of the abdominal muscles, which lead to the massaging of the underlying glands. This leads to increased blood flow in these structures and enhances their health. Practices such as Nadi Shodhanya Pranayama and Bhashrika Pranayama involve the movement of diaphragm which not only massages the abdominal organs and enhances their blood supply but also stimulates the vagus nerve. Nadi Shodhanya Pranayama is especially known for its action of shifting the body from sympathetic to parasympathetic predominance. This leads to the shift of body from primarily fight-and-flight response to rest-and-repair response causing the healing effect throughout the body. In the gastrointestinal tract, parasympathetic predominance means better secretion of digestive juices and better peristalsis which means that there is less occurrence of indigestion and constipation. Shatkarma procedures have the direct effect of cleansing the body. Hence, the body can remove the toxins accumulated in the digestive tract as well as the whole body and give the body appropriate opportunity to heal.

Apart from the physical benefits, Yogic procedures also have the added benefit of maintaining calmness and mental stability. Direct references can be found in the classical yoga text about the calming effect of practices such as Bhramari Pranayama, Dharana, and Dhyana which has been further proved by many studies. Bhramari Pranayama is mentioned as Mana Vishranti Kara, which means that it calms down the mind and removes the stress as well as emotional disturbances. Studies show that regular practice of Bhramari Pranayama reduces cardiovascular reactivity to stress by inducing parasympathetic predominance and cortico-hypothalamic-medullary inhibition. Many studies have also shown the calming effect of other Yoga practices such as Asana, Pranayama, and Dhyana. These practices have shown excellent results in different mental as well as mood disorders such as depression, anxiety, stress disorders, and eating disorders. Nadi Shodhana Pranayama helps to maintain emotional harmony and well-being. These facts help to prove the statements given in Yoga literature, stating that Asana and Pranayama remove all types of diseases (Asana rujam hanti and Pranayama Yuktena Sarva Roga Kshaya). Hence, these practices can be used in the conditions of gastrointestinal disorder caused by mental and emotional factors [Figure 5].

5. CONCLUSION

Mandagni is the root cause of all disorders, especially gastrointestinal disorders. This review focuses on the effect of yoga in Mandagni and Mandagni Janya Vyadhis specific to the digestive system. There is cause and effect association between negative emotions and stress with health. Constant exposure to stressors leads to hyperactivation of stress response from amygdala and hypothalamus which affects all the systems of the body. As a result, various stress-related disorders such as irritable bowel syndrome, eating disorders, anorexia, peptic ulcer, and inflammatory bowel diseases are increasing day by day. Yogic practices such as Shatkarma, Asana, Pranayama, and meditation are found to break the chain of pathogenesis of various gastrointestinal disorders strengthening body and mind.

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7. AUTHORS’ CONTRIBUTIONS

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10. CONFLICTS OF INTEREST

Nil.

11. DATA AVAILABILITY

This is an original manuscript and all data are available for only review purposes from principal investigators.

12. PUBLISHERS NOTE

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Ajirna

Aama Formation

Mandagni

Jatharagni Mandhya, Dhatwagni Mandhya

Gastrointestinal Disorders

Figure 1: Samprapti of gastrointestinal disorders

Figure 2: Pathophysiology of deranged agni due to negative emotions

Figure 3: Stress physiology

Figure 4: Stress and gastrointestinal pathology

Figure 5: Yoga in the management of GIT disorders
Table 1: Yogic approach in the management of various gastrointestinal disorder in classical text

<table>
<thead>
<tr>
<th>Yoga practices</th>
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<td>Bhujangini mudra</td>
<td>Jathara roga</td>
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Table 2: Direct references of the practices Agnideepana (enhance the Agni)

<table>
<thead>
<tr>
<th>Shatkarma</th>
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<td>Mudra</td>
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