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Review Article

Others Section

Investigating the Physiological Impact of *Manipura Chakra* Activation on Prevention of Hepatic Steatosis: A Narrative Review

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ABSTRACT

The third of the seven *chakras* is the *Manipura chakra*, also known as the Coeliac plexus, located within the subtle body. It initiates and regulates various functions of the gastrointestinal system. Its proximity to the navel is often associated with personal power and self-esteem. The objective of the study is to clarify the influence of the *Manipura chakra* on Non-Alcoholic Fatty Liver Disease (NAFLD). Indigenous literature and recent research suggest that a balanced *Manipura chakra* may contribute to reducing inflammation and enhancing liver function. The present paper elaborates on the relationship between *chakra* alignment and physical health to reveal holistic methods that may complement conventional medical therapies for NAFLD. The research analyses consolidated literature from classical texts, contemporary science and published works (PubMed, Scopus, Web of Science and other esteemed journals) concerning the role of the *Manipura chakra* and its impact on gastrointestinal organs. The *Manipura chakra* is regarded as a center of fire, or *Agni*, which governs the functioning of the gastrointestinal system. Thus, it is considered essential for improving the condition of fatty liver disease. The gastrointestinal organs are closely connected to the coeliac plexus, which regulates their function. The physical and psychological characteristics of the *Manipura chakra* highlight its substantial importance. Disruptions in the energy flow of the *Manipura chakra* may lead to various disorders associated with the abdominal region, such as obesity, diabetes, pancreatitis and liver disease. *Yoga* and *pranayama* activate the *Manipura chakra*, thereby enhancing gastrointestinal function and alleviating the impacts of illness.

Keywords: *Asana*, Gastrointestinal disease, Insulin resistance, Non alcoholic fatty liver disease, Non alcoholic steatohepatitis, Obesity, *Pranayama*

INTRODUCTION

Over time, fatty liver disease has emerged as a significant global health issue, with 32.4% of the world's adult population affected by NAFLD [1]. Over the past decade, the clinical burden of NAFLD has been shown to extend beyond liver-related morbidity and mortality. There is also mounting evidence that NAFLD is a multisystem disease that impacts several extrahepatic organs and regulatory pathways [2]. It is projected to become the primary cause of liver transplantation and cirrhosis in the coming decades. Recent research has identified Non-Alcoholic Steatohepatitis (NASH) as the fastest-growing and second most common cause of liver transplants in the United States [3].

As treatments for liver disorders have advanced considerably, there has been an increased focus on liver diseases resulting from obesity, diabetes and metabolic dysfunction. Notably, obesity is highly prevalent among liver disease patients. The obesity epidemic, first recognised on a large scale in the 1970s, has since spread across all demographic groups and geographic regions worldwide [4,5].

Primary hepatic steatosis is a condition that can be managed through dietary modifications and lifestyle changes, including regular *yoga* practice. Characterised by central obesity, insulin resistance, hyperlipidaemia, hyperglycaemia and hypertension, NAFLD is considered the hepatic manifestation of metabolic syndrome.

Fatty Liver Disease

When the liver does not function properly, fat begins to accumulate excessively within the liver cells (hepatocytes), leading to inflammation [6]. Several factors make the liver vulnerable, including metabolic dysfunction, high-fat consumption, hypertension, central obesity, environmental influences, genetic predisposition, disturbed biological rhythms, starvation, medications and emotional imbalance [7,8].

Fatty liver, also known as hepatic steatosis, is defined as intrahepatic triacylglycerol accounting for at least 5% of liver weight or lipid vacuoles present in 5% of hepatocytes, in the absence of other known causes, such as medication side-effects, viral infections, or excessive alcohol consumption [9].

MATERIALS AND METHODS

The data is derived from indigenous texts as well as modern research, which highlights the relevance of *yoga asana*, *pranayama* and *chakra* practices. Contemporary research is increasingly focusing on the ancient science of India to address present-day health challenges. Various books, research papers and news articles continue to support this line of study. Databases were searched using Google Scholar through a university web browser to identify research studies examining the therapeutic effects of the *Manipura chakra*. Studies were included in this review based on the following criteria:

- The article had to be peer-reviewed;
- It had to be published between 1950 and 2024;
- The intervention had to include some form of *asana* or *pranayama*.

Subtle Chakra

The concept of *chakras* originates from ancient texts such as the *Vedas*, *Darshana Upanishad*, *Yogashikha Upanishad* and *Shandilya Upanishad*, composed around 5000 BC [10]. These texts describe seven *chakras*, each with unique characteristics, qualities and interconnections with body organs. The seven *chakras* mentioned in yogic literature are: *Muladhara chakra*, *Swadhisthana chakra*, *Manipura chakra*, *Anahata chakra*, *Vishuddhi chakra*, *Ajna chakra* and *Sahasrara chakra*.

The functioning of *chakras* represents not only psychological, emotional and spiritual well-being but also physical health [11]. Since

chakras can only be perceived through extrasensory perception, they cannot be physically observed. These central energy centers are believed to supply vital energy to every cell and nerve in the body. Extending from the base of the spine to the brain, the *chakras* are aligned along the spinal cord.

The *Manipura chakra* is associated with willpower, vitality, a sense of purpose and self-esteem [12]. These qualities are considered essential for developing the ability to engage in productive work and lead a meaningful life.

The body's energy centers, or *chakras*, are thought to correspond to pathways of the spinal cord, extending from the base of the spine to the top of the brain. The physical body consists of nerves that transmit electrical signals between the brain and spinal cord. When the spinal cord receives a signal from the brain, it relays it to the rest of the body. Spinal nerves act as mediators between the brain and organs. Because of this close connection, organs are easily influenced by emotions.

Since ancient times, yogis have utilised the seven *chakras* for spiritual growth. Spirituality can be approached in several ways, one of which is *Kundalini dhyana*, which facilitates a connection with the deeper wisdom of nature and spirit. In modern times, this practice is considered an effective means of attaining mental tranquility and reducing psychosomatic disorders.

Studies on cardiovascular disease and hypertension have shown that patients who engage in spiritual practices often recover more swiftly than non-spiritual patients [13]. Functional imaging studies of *Kundalini Yoga* suggest that meditation activates the hippocampus and amygdala, leading to increased parasympathetic activity [14]. This initial relaxation and deeper tranquility are accompanied by reductions in cardiac and respiratory rates—a physiological response observed during meditation—which is also associated with decreased epinephrine levels [15].

Noradrenaline, cortisol and Corticotropin-Releasing Hormone (CRH) are critical components of the sympathetic nervous system, which elevates stress levels associated with the "fight or flight" response. These hormones can adversely impact gastrointestinal health. Conversely, dopamine, serotonin, melatonin, Dimethyltryptamine (DMT), acetylcholine, glutamate, Arginine Vasopressin (AVP), N-Acetylaspartylglutamate (NAAG) and Gamma-Aminobutyric Acid (GABA) are essential for maintaining optimal mental and physical health. These neurotransmitters, stimulated by the parasympathetic nervous system, contribute to memory, sleep, blood pressure reduction, cognitive function, mood regulation, stress reduction and alleviation of anxiety.

Serotonin, in particular, enhances gastric emptying, intestinal secretion, gastrointestinal motility and colonic tone. It also regulates pancreatic secretion, augments insulin secretion, facilitates glucose absorption in muscle tissue, promotes lipogenesis in adipose tissue and contributes to lipid accumulation in the liver [16,17].

Anatomical Position of the *Manipura Chakra*

The *Manipura chakra* and the coeliac plexus occupy the same anatomical position. The *chakra* is also referred to as Nabhi Moola [18]. From the Nabhi, the Shira and Dhamani extend in vertical, horizontal and lateral directions.

The coeliac artery originates in the retroperitoneal region [19], anterolateral to the aortic diaphragm, at the level of T12–L1. This region comprises the coeliac, superior mesenteric and aortorenal ganglia, along with the splanchnic nerve and abdominal branches of the posterior stem of the vagus nerve [20,21]. The coeliac plexus consists of a dense network of interconnected nerve fibres and ganglia, forming a mesh-like structure. Its principal components are the inferior mesenteric ganglion, the superior mesenteric ganglion and the coeliac ganglia [22].

The majority of abdominal organs are innervated through the sympathetic and parasympathetic nervous systems within the coeliac plexus. These include the spleen, liver, gallbladder, pancreas, bilateral kidneys, stomach, small intestine and two-thirds of the large intestine. At the L1 vertebral level, the plexus is located anterior to the epigastrium and aorta, extending anterolaterally around the aorta, just below the coeliac trunk [23].

Physiology of *Manipura Chakra*

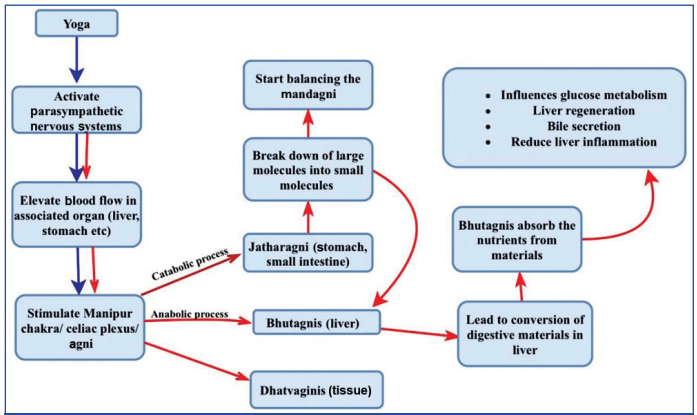
The stomach initiates the secretion of gastric juice, which is further supplemented by secretions from the liver and pancreas to complete digestion. The regions of *Agni* or Pitta are responsible for the breakdown and conversion of proteins and vitamins, while absorption is aided by *Samana Vayu*.

The coeliac plexus, a complex network of nerves situated in the abdominal cavity posterior to the rectus abdominis muscle, regulates numerous visceral organs, including the liver, gallbladder, spleen, pancreas, stomach, kidneys, small intestine and the proximal two-thirds of the large intestine [24].

The coeliac plexus is also referred to as the solar plexus because of its radiating nerve fibres. The digestive tract and visceral tissues of the abdomen are innervated by the autonomic nervous system through the coeliac ganglia, which are nerve bundles located in the upper abdomen. These ganglia serve as integrative centers that regulate secretion, absorption and intestinal motility throughout the digestive system. Due to their close association with the gastrointestinal tract, the ganglia play a major role in several clinical conditions, such as gastritis and liver disease [25].

The coeliac plexus is an extensive network of sympathetic and parasympathetic nerve fibres. The greater and lesser splanchnic nerves provide sympathetic input to the coeliac plexus. Parasympathetic contribution is divided into two parts: the anterior vagal trunk provides a minor input, while the posterior vagal trunk contributes more significantly [25]. Both parasympathetic and sympathetic inputs from the vagus and splanchnic nerves are received by the coeliac plexus, which then transmits the corresponding postsynaptic outputs to the abdominal viscera. Sensory impulses, such as pain and reflexes, are transmitted from the foregut and midgut to the coeliac plexus [26]. The parasympathetic division facilitates digestion and peristalsis by increasing glandular secretions, whereas the sympathetic division constricts blood vessels, inhibits peristalsis and redirects blood to skeletal muscles.

According to *Charaka*, there are 13 types of *Agni* in the body (*Ch. Chi. 15/18*) [27]. *Jatharagni* (1, present in the stomach and duodenum), *Bhutagni* (5, present in the liver) and *Dhatvagni* (7, present in tissues) play crucial roles in digestion and metabolism. In the initial catabolic process, food begins to break down with the help of *Jatharagni* in the stomach and duodenum, as shown in [Table/Fig-1]. According to the Hareet Samhita, the concept of Mandagni refers to a state in which Kapha and *Vata* are elevated beyond their



[Table/Fig-1]: Elaboration of the physiology of *Manipura chakra* and its metabolism process.

normal ranges [28]. Mandagni reduces digestive capacity, leading to the accumulation of lipids in the liver and abdominal region.

Bhutagni is associated with the *Pancha Mahabhuta* (five basic elements): *Prithvi* (earth), *Ap* (water), *Tejas* (fire), *Vayu* (air) and *Akasha* (ether). *Acharya Charaka* stated that the five *Bhutagni* digest their respective elemental components. Following the digestion of food by the *Bhutagni*, the resultant materials nourish their corresponding Bhautika elements within the body (*Ch. Chi. 15/13*) [28]. The *Bhutagni* act after the *Jatharagni* has disintegrated food particles in the stomach and duodenum. They reside in the liver, which receives deoxygenated yet nutrient-rich blood through the hepatic portal vein that connects the gastrointestinal tract to the liver.

Selection Criteria of *Yoga Asana* and *Pranayama* for NAFLD

The *Manipura chakra* innervates the digestive tract and its activation is influenced by the practice of selected *asanas* and *pranayama* techniques. The liver performs essential functions throughout life, assimilating nutrient-rich blood from the stomach, pancreas, spleen, small intestine and large intestine via the hepatic portal vein, which also carries Free Fatty Acids (FFA). The liver releases glucose according to the body's needs or stores it in hepatocytes. Excess FFAs accumulate within cells as triglycerides, causing inflammation of hepatocytes. This disrupts gastric juice production, impairs liver function and obstructs energy flow.

The main component of *asana* practice is the stretching of muscles combined with proper breathing techniques. The degree of stretching can be regulated according to the body's needs. *Asanas* are most effective when held for some time, as sustained stretching aids in rehabilitation. Nerve fibres originating from the brain and spinal cord (efferent nerves) stimulate muscles by sending electrical impulses that result in smooth, coordinated contraction [29].

Asana practice enhances blood circulation in the liver region, particularly through poses such as *Ardha Halasana*, *Paschimottanasana*, *Trikonasana*, *Paripurna Navasana*, *Supta Vajrasana*, *Ardha Matsyendrasana*, *Dhanurasana*, *Ardha Ustrasana*, *Shalabhasana*, *Bhujangasana* and *Mandukasana*. *Surya Namaskar* is considered a comprehensive practice combining mind, body and breath, influencing glandular activity [30] and improving the physiological functions of multiple organs. It promotes blood circulation in the abdominal region and reduces excess visceral fat.

Ardha Halasana and *Trikonasana* engage the transverse abdominal muscles along the spinal nerves, thereby stimulating digestive functions and abdominal organs [31,32]. In *Ardha Matsyendrasana*, the abdominal viscera—including the rectus abdominis, transverse abdominis and external and internal obliques—are subjected to stretching [33]. *Paschimottanasana* contracts and relaxes the entire abdominal and pelvic region, directing awareness to the *Manipura* and *Vishuddhi chakras*, as well as influencing the liver, pancreas, kidneys, spleen and adrenal glands [34,35]. *Supta Vajrasana* provides an extensive stretch to the bowels and stimulates the abdominal region [36]. By inducing abdominal pressure, it elevates the legs and torso. *Shalabhasana* strengthens the core [32], while *Bhujangasana*—spiritually linked to the *Manipura* and *Vishuddha chakras*—involves extension of the abdominal region, resulting in improved gastrointestinal function and enhanced metabolic processes [37]. *Mandukasana* is closely associated with the *Manipura chakra* and boosts abdominal function.

Yogic breathing techniques, known as *Pranayama*, enhance oxygen intake, thereby improving endurance, supporting immune defense against pathogens and gradually reducing the root causes of various ailments [38]. Practices such as *Kapalabhati*, *Bhastrika* and *Surya Bhedana* invigorate the *Manipura chakra* and enhance Pitta production. *Kapalabhati Pranayama* is described in the *Hathapradipika* as a *Kapha-nashaka* (phlegm eliminator). *Bhastrika Pranayama* is considered one of the most important practices for alleviating diseases caused by *Vata-Pitta-Kapha* imbalances. *Surya Bhedana* is highly effective for cleansing the cranium, correcting *Vata* imbalances and eliminating infections [39].

The integration of these *pranayama* techniques helps eliminate doshic imbalances and restore equilibrium among the *Tridosha*. When *Kapha dosha* is elevated, it affects multiple regions of the body. The liver, in particular, becomes susceptible as lipids begin to accumulate in hepatocytes. This condition reduces the production of *Pitta dosha* while increasing *Kapha*. However, through the practice of *asanas* and *pranayama*, excessive *Kapha* can be regulated and Pitta levels can be enhanced to facilitate optimal food digestion.

Thus, these practices improve the processes of digestion, absorption and secretion within the abdominal region by promoting balanced integration of the sympathetic and parasympathetic nervous systems [40].

DISCUSSION

The *Manipura* is the third *chakra*, containing numerous nerves that interact with various organs. It functions as a powerful energy center in the body, invigorating the abdominal area and facilitating the efficient breakdown of food into smaller particles for nutritional absorption. Proper functioning of this *chakra* enhances vitality, willpower, self-esteem, confidence and decision-making abilities. Historically, yogis utilised it for spiritual purposes to activate the energy of all seven *chakras*; however, contemporary research indicates a notable influence of the *Manipura chakra* on diabetes [41,42], Irritable Bowel Syndrome (IBS) [43], obesity and pancreatic as well as overall gastrointestinal tract function [44,45], all of which are linked to the abdominal region. *Chakra* activation has been shown to reduce fasting blood sugar, postprandial blood sugar and Glycated Haemoglobin (HbA1c) levels [46].

Each *asana* and *pranayama* primarily targets compression and relaxation of the epigastric and umbilical regions of the abdomen, gradually stimulating the *Manipura chakra*. Activation of spiritual *chakras* facilitates the transition from sympathetic to parasympathetic nervous system dominance, thereby improving digestion and metabolism. Yogic interventions have demonstrated reduced liver fibrosis and liver enzyme levels. For example, in one study, the mean FibroScan value decreased from 8.3 to 6, Serum Glutamic-Oxaloacetic Transaminase (SGOT) Aspartate Aminotransferase (AST) levels decreased from 56.33 to 41.66 U/L, Serum Glutamic-Pyruvic Transaminase (SGPT) Alanine Aminotransferase (ALT) levels decreased from 47 to 38 U/L after 90 days [47] and alkaline phosphatase levels decreased from 93.3 to 79.3 U/L [48]. Following 90 days of yogic intervention, significant reductions in liver enzymes were observed: AST decreased from 45.2 IU/L to 35.3±2.27 IU/L, while ALT decreased from 82.7 IU/L to 58.79±3.64 IU/L. Triglyceride levels were reduced from 151.88±43.08 to 130.11±28.82, while Low-Density Lipoprotein (LDL) levels fell from 144.74 to 120 and High-Density Lipoprotein (HDL) levels improved from 44.63 to 47.15 [49]. These findings suggest that *yoga* practices can significantly improve liver function.

From ancient times, *chakra* activation was primarily regarded as a means of spiritual upliftment. Modern science, however, has begun to connect *chakras* with bodily functions, demonstrating measurable improvements in associated regions. *Chakras* are located within the body and are connected to their respective organs through the sympathetic and parasympathetic nervous systems; thus, their activation may lead to significant functional benefits. More scientific research is required to establish a clearer understanding of *chakra* functions.

CONCLUSION(S)

Yoga is a remarkable practice for the human body, establishing harmony between mind and body. Its application enhances physiological functions. Yogic practices stimulate the *Manipura*

chakra, increasing blood flow in the umbilical region and parasympathetic activity, thereby enhancing gastrointestinal function. Non-Alcoholic Fatty Liver Disease (NAFLD) often develops as a result of a sedentary lifestyle, characterised by excess body weight relative to height. The accumulation of adipose tissue in the abdominal region elevates the risk of metabolic diseases. NAFLD is not solely a physical ailment but also reflects abnormalities that extend into the emotional domain. Evidence from yogic literature and contemporary studies suggests that a yogic lifestyle—including *asana* and *pranayama*—positively influences liver disease and enhances *Agni* (digestive fire). Consequently, consistent practice may improve the management of NAFLD and its associated outcomes.

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