

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

185,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Significance of Diet and Behavior During Pandemic Situation According to Ayurveda

Gaurav Sawarkar and Punam Sawarkar

Abstract

Ayurveda is the oldest science of health care, explaining both the perspectives, i.e., prevention and cure of diseases. The fundamental principles of Ayurveda explore life's philosophy, including the entire cosmos having five significant elements (Akash, Vayu, Agni, Jala, and Prithvi) establishing the Prakruti, i.e., a unique combination of physiological and psychological characteristics in a human being. In Ayurveda, Ahara (Diet), and Vihar (Exercise/Movements), fundamental pillars are thoroughly explained according to a specific Prakruti, which denotes personalized medicine in the present era. Diet is the essential factor that comprises the five significant elements with six rasas (Sweet, Sour, Saline, Pungent, Bitter, Astringent). Each Rasa has its specific nutritional properties helpful for the maintenance of health. Moreover, it also prevents diseases and plays a vital role in the restoration of health from disease conditions. The appropriate diet plan is essential in the pandemic situation because the digestive power (Agni) becomes hampered due to faulty lifestyle and unwholesome food habits that result in vitiation of three bio-humors (Vata, Pitta, Kapha) in the body. According to Ayurveda's basic principles, weakened digestive power is the main culprit for forming various diseases. Therefore, it is highly imperative to select a suitable diet and behavioral regimes during pandemic situations.

Keywords: Ayurveda, diet, behaviour, pandemic, health

1. Introduction

Ayurveda is a science, aims to heal and maintain the quality of life with its longevity. It is a simple art of living comprising of practical knowledge, philosophical and spiritual illumination. Ayurveda medicine is an ancient legacy that resides in the Indian subcontinent. Millions of people in India are presently applying Ayurveda in daily life. Nowadays, it is in practice for health care in European countries. The literary meaning of the word "Ayurveda" is a compound of the word 'Ayush' (life principle) and 'Veda' (knowledge). Life itself is defined as the body's combination, sense organs, mind and soul, the preventing factor for decay and death. With this perspective, Ayurveda includes healthy living and therapeutic measures like purification (Panchakarma) and palliative medicine related to physical, mental, social, and spiritual harmony [1]. Thus, Ayurveda is motivating to preserve a healthy person's health and treat causative factors of pathogenesis.

2. Methods

A comprehensive literature search related to Diet and Behavior and description related basic principles of Ayurveda using all available Ayurvedic compendium, research articles from the various database such as Google Scholar, PubMed, Shodhganga was performed. The reference list of research articles identified and were screened for the diet and behavior in health security.

3. Fundamental principles of Ayurveda

3.1 Theory of Panchamahabhut

The basic principle of Ayurveda denotes that everything in the external universe also appears in the human body's internal cosmos. The human body consists of millions of cells, having a self-disseminating and self-correcting system to maintain harmony in the body as similar to the universe. Human is the essence of the universe, there is as much diversity in the world, and the same is observed in human beings themselves. In other words, human beings are a living microcosm of the universe, and the universe is a living macrocosm of human beings. The Panchamahabhut are the five significant elements present in both the form as a microcosm in the human body and cosmos in the universe, namely Prithvi (Earth), Jala (Water), Agni (Fire), Vayu (Air), and Akasha (Aether). Panchamahabhut is taking part in the formation of an embryo and shelter a development of the origin with its different peculiarities, gives appropriate shape to the body and various organs with the help of Prithvi (Earth). Formation of multiple types of fluids (like blood, serum, lymph, etc.) and gives elasticity, moistness to the body with the help of Jala (Water). Bodily temperature, digestive fire, various enzymes, metabolism symbolizes Agni (Fire). The various activities inside the body (circulation, digestion, filtration, transportation, respiration, etc.), multiple movements, and body functions represent Vayu (Air). The numerous spaces in the body (blood vessels, capillaries, gastrointestinal space, lungs lobules, ear, eyes, nostrils, skin pores, etc.) symbolizes Akasha (Aether). Panchamahabhuta also helps in the formation of Dosha, three fundamental bodily humors; Vata, Pitta, and Kapha. The related elements are Air and Ether, Fire and Water, Water and Earth take part in the formation of Vata, Pitta, and Kapha, respectively. Thus, Panchamahabhuta is the utmost important factor that describes the fundamental principles of Ayurveda [2].

3.2 Theory of Triguna

The concept of Guna is thoroughly explained in scientific literature since Bhagwat Gita, Sankhya Darshana, and Atharva Veda. Triguna theory has been utilized to explain the perception of personality in modern era as well. Triguna is Sattva, Rajas, and Tamas, featured with stability, activation, and inertia, respectively. All three exist in human beings, representing the predominance of one or other feature, providing unique quality to humankind. The manifestation of Triguna is attributed to the mental function and mental processes of human beings and all living beings, including the food, surrounding animals, and other elements in the environment [3]. Each individual behaves or lives based on the dominance of Triguna they have and project their personality as well in the mode of worship, the type of food consumed, and everyday activities, having specific qualities (Table 1).

SN	Triguna	Qualities
1	Sattva	Spiritual qualities, mental strength, respect for teachers and elders, non-violence, kindness, silent demeanor, self-control, meditative, etc.
2	Rajas	Passionate, enthusiasm, interest, activity & work-driven, restlessness, desire, greed, etc.
3	Tamas	Cautiousness, apprehension, revengeful, hardworking, materialistic, ambiguity, idleness, etc.

Table 1.
The qualities of Triguna are described as follows.

3.3 Theory of Tridosha

The fundamental concept of health is a balanced state between three bodily humours, i.e., Tridosha (Vata, Pitta, and Kapha). Vata is the air principle necessary for every movement and function of various systems. Pitta is the fire principle useful for digestion, energy level, and metabolism in the system. Kapha is the water principle related to mucous, lubrication, nutrient, serous fluid in the system. The five significant elements (Panchamahabhut) combine in pairs to form three dynamic forces: Vata, Pitta, and Kapha, continually moving in emotional balance with the others, required for healthy life normalcy in human behavior.

Every person comprises all three Doshas. However, the proportion varies according to the individual and is predominant [4]. That is why people can have many standard features and have an endless variety of nature, which decides the Prakrit of each individual. Each Dosha has its characteristics of governing principles (Table 2).

3.4 Theory of Sapta Dhatu

Dhatus are the primary supporter to structure and function of the body as like a tissue, seven in number known as Rasa (final metabolic juice and plasma-derived from the digestive system), Rakta (blood and related circulatory system), Mamsa (musculature, tendons, muscular system), Meda (fat, fat-like structures, adipose tissues), Ashti (bones, bony part, and skeleton), Majja (marrow, bone marrow) and Shukra (structurally and functionally related to the male and female reproductive system). These all structures that make the body, an integral part of it, imbalance causes fatigue and diseases. It is imperative to understand the normal and abnormal functioning of all Dhatus to recognize the exact pathophysiology in the body during disease condition. The formation of Dhatus is consecutively, and nourishments of each Dhatus depends upon the previous one. During this tissue formation process, some metabolic waste is produced as tissue excreta is known as Dhatumala, also having a unique identity in structural and functional processes in the body. If some abnormality is molded in Rasa Dhatus, the sequential nourishment will be affected, resulting in improper microcirculation and developing deformity in the next tissue [5].

3.5 Theory of Srotasa

Srotasa is the passages or channels through which Dhatus (various tissues) are transported for their transformation and metabolism. Srotasa comprises multiple systems in the body, described under the physiological heading, the structures from which the contents move out, ooze out, or transude out. The nutrient substances are provided to various tissues through these channels, related to their corresponding

Dosha	Vata	Pitta	Kapha
Predominant stage in life	Old age	Teen and Adult.	Childhood years.
Function	Body movement, respiration, natural urges, the transformation of the tissues, motor and sensory functions, secretions, anxiety, emptiness, nerve impulses, etc.	Body temperature, digestion, eyesight, understanding, hunger, thirst, intelligence, anger, hatred, jealousy, etc.	Steadiness, energy, lubrication, compassion, greediness, attachment, build-up, holding, etc.
Characteristics	Cold, light, irregular mobility, dry, rough, etc.	Hot, light, liquid, delicate, sharp, smelly, soft, strong, etc.	Fatty, cold, heavy, stable, dense, smooth, etc.
Stage of Vitiation	nerve irritation, high blood pressure, gas, confusion, nerve loss, congestion, constipation, thoughtlessness, etc.	Ulceration, hormonal imbalance, irritable skin, emotions, anger, faulty digestion, inability to understand, slow metabolism, etc.	Sinusitis and cough and cold, obesity, lethargy, experiences a dry respiratory tract, burning stomach, etc.

Table 2.
The characteristics of the governing principles of life are as follows.

tissues’ metabolic state through different mechanisms. They are of different shapes like circular, elongated, and reticular. Channels are microscopically innumerable in numbers, but they are thirteen in number or eleven in pairs as per other ancient authors in a macroscopic manner. Each channel has its roots organs; an entire track is governed given its physiology, pathology, and treatment [6].

3.6 Concept of Prakriti

Prakriti is the crucial concept, and the fundamental constitution of the body decides at the time of conception, fixed throughout the lifetime. It is the genetically determined physical and mental constitution of the individual. It is a combination of Vata, Pitta, and Kapha. Different persons have different varieties known to be their basic Prakriti as per the predominance of bodily humor. According to Ayurveda, it is the unique feature of human beings that every individual reacts differently when exposed to the same environment as once fingerprint or DNA. Thus, it is necessary to determine the person’s exact Prakriti to assess a person properly for their diet, behavior, pathology, and treatment. Every person has their own unique identity, which constitutionally defines body physiology, stimuli to environmental factors, the reaction towards various drugs, and susceptibility to multiple diseases. However, in the current scenario, it is considered as a concept of preventive and personalized medicine. The knowledge of Prakriti is a unique specialty and essential tool to understand the mental and physical nature of the person, predict disease susceptibility, helps in diagnosis of the disease, and even break the pathophysiology of the disease [7]. There are many recognizable phenotypic features described for each type of Prakriti (Table 3).

3.7 Concept of Koshta

In Ayurveda, the term Koshta is explained in two senses; first is regarding anatomical ground viz. space and hollowness of the body and second in terms of physiological way viz. bowel movement according to the fundamental constitution of the person. There are three types of Koshta explained in the Ayurveda context viz. Kura (hard

Vata	Pitta	Kapha
Body frame is thin, does not gain weight. Skin is dry rough with dark complexion. Hairs are dry and splitting. Activities are quick. Appetite is variable. Working capacity is less. Poor immunity. Required warm food and climate. Perspiration is quite scanty. Frequent constipation, having disturbed sleep. Anxious, depression, unpredictable in nature.	Body frame is medium. Skin is delicate, pinkish complexion, warm in touch. Hairs are soft, having premature graying and tendency to baldness. Increased appetite. Having sharp vision. Feels internally warm and hot. Required cold food, and climate. Hot food and climate can not be tolerated. Having frequent loose motion, excessive thirst and smelly perspiration. Brilliant, having sharp memory, brave, jealous, aggressive and commanding in nature.	Body frame is broad and large, tendency to gain the weight. Complexion is fair, glossy and skin is thick, soft and smooth. Hairs are thick, oily and dark. Having good working stamina, but less physical activity. Voice is deep and pleasant. Perspiration is moderate and having low thirst. Sleep is deep and sound. Eyes are large calm and stable. Having calm, joyful and polite nature.

Table 3.
Key distinguishing features for Prakriti determination.

bowel), Mrudu (soft bowel), Madhyam (moderate bowel), having their features with specific Prakriti and Dosha (**Table 4**). It can be assessed with bowel habits frequency, consistency, straining, or efforts, and time is taken for proper defecation [8].

3.8 Concept of Agni

Agni has an integral role in digestion and metabolism, that ingested food is digested, absorbed, and assimilated, make available as a final metabolic juice with the help of this rest of the tissue (Dhatu) nourished sequentially. As per modern medicine, metabolic processes, division, and multiplication are a continuous process from birth to death. As biological energy, Agni essential to be constant for the body’s survival, provided strength to every cell till the end of life. Agni is also classified into four heads, viz. Vishama (Irregular Metabolism), Tikshna (Hypermetabolism), Manda (Hypometabolism), Sama Agni (balanced state) correlated concerning Koshta as in **Table 4**. The balanced Agni featured happiness, perfect health, calm and clear state of mind. Individuals can digest a reasonable quantity of food in any season without any problem and can easily tolerate changes in the environment and changes in the seasons. A person can enjoy balanced digestion, absorption, and elimination [9].

3.9 Concept of Ahar and Vihar

Ahar means taking in, swallowed through the throat, esophagus, and process in the gastrointestinal tract. Food is the best thing that endures life and provides strength, color, complexion, vigor, and body development, hence called superior medicine. The great scholar Lolimbaraj said that when the diet is wrong, medication is of no use; when the diet is correct, there is no need for medicine. Most of the time, the cause of numerous diseases is improper diet. Food also contains five great elements, i.e., Panchamahabhutas; if one consumes food in proper proportion, it will help balance similar elements in the body. Light food comprises Vayu, Agni, and Akasha Mahabhuta, whereas heavy food contains Prithvi and Jala Mahabhuta predominance. Based on Agni and Koshta, individuals have to consume their diet concerning the saturation point to maintain proper body strength [10].

SN	Koshta	Meaning	Dosha relation	Agni relation	Feature
1	Kura	Hard bowel	Vata	Vishama	Poorly secretive and absorptive, hard feces with the difficulty of elimination or even non-elimination. Appetite Irregular, variability in digestion, abdominal distension or gas, tendency of constipation, etc.
2	Mrudu	Soft bowel	Pitta	Tikshna	Stool is soft, lubricated and slippery, watery or semi-solid, nature of hyperacidity, prone to gastritis, heartburn, hot flashes, acidic saliva, and fever. Tendency of loose motion etc.
3	Medium	Moderate bowel	Kapha	Manda	Stool with more lubrication, but less slippery, having optimum secretion and absorption, metabolism is slow and feel heaviness in the stomach, the body, and the mind, etc.

Table 4.
Characteristics of the Koshta.

The word Vihar means transportation, distribution, wandering, which includes daily and seasonal activities. According to individual Prakriti, Agni, and Kosta, great scholars have described their importance, usefulness, and harmfulness. The great ancient scientist prescribed daily schedule and behavioral changes in terms of daily routine, yoga and exercise, nighttime routine, seasonal routine, regarding basic instinct, suppressible or non-suppressible natural urges, code of conducts related to ethics, social, mental, moral, and physical category, sidestepping of excessive and incorrect use of sense organs, governing on speech and thoughts. With this regime, a person remains healthy and can prevent disease conditions related to lifestyle disorders [10].

4. Importance of Agni

The Agni, biological energy, in a balanced state, keeps the body healthy and leads to long life. The imbalance or stoppage of this energy’s functioning, the whole metabolism would be disturbed, and the individual may ill, diseased, or dies in a short duration. It plays a vital role in nutrition. Most of the diseases, physical-physiological and psychological, are the byproducts of the Agni’s malfunctioning, hence called the key root of health. It coordinates physiological processes like digestion, reabsorption, sensations, and the formation of energy. Due to the malfunctioning of Agni, food is not digested correctly and formed a toxic substance in the body that is referred to as ‘Ama’ in Ayurveda. This poisonous substance is solely responsible for poor digestion, improper blood circulation, low energy level, poor complexion, poor immunity leads to disease conditions according to Prakriti, and Dosha-Dhatu balance [11, 12].

5. Importance of Ahar and Vihar

Ayurveda, Ahar (Diet), and Vihar (Behaviour) are advised as per seasonal and diurnal regimes based on Prakriti. The individual should adopt these regimes as per

their Prakriti and keeps equilibrium in Dosha (three bodily humours). Ayurveda offers extensive preventive measures considering Prakriti types to maintain health with favourable foods and behavioral, physical activities. And at the same time, restrict and advised to avoid unfavorable diet and physical activities that may create disease and illness in the body. The healthy state of the body and disease condition depends entirely on Agni concerning diet and behavior [13].

6. Role of diet and behavior during a pandemic situation

The basics of Ayurveda suggested the state of equilibrium of Dosha (three body humors), Dhatu (seven types of tissues), and Trimala (Sweat, Urine, Stool) for the healthy living being. The ingested food gets digested well with the help of balanced biological energy and form productive nutrients for the nourishment of the bodily tissues. It sequentially takes place with the metabolic energy of each tissue and nourishes dependent tissues also. A healthy diet is essential for good health, which protects the body from many diseases. A healthy diet means a variety of foods, with less salt and sugar, the saturated and trans essential fats, including cereals, starchy roots, lentils and beans, fruits and vegetables, animal source foods (as per need), a preferably fibrous diet with sprouts, salad, leafy vegetables which keeps the body fit and fine. The intake of diet at the appropriate time and with due interval is essential. A person should consume food which is suitable to him as per his Prakriti and which digested quickly. Keep three-four hours interval between breakfast and lunch. Please keep in mind the gap between dinner and next morning breakfast should be eleven-twelve hours. With proper diet, quality of sleep is of utmost importance for good health. For good digestion and sleep, keep a minimum two hours interval between dinner and bed time [14]. Adequate sleep is as equally important as eating healthy and exercising. Nowadays, people sleeping less than the required duration are connected with higher body weight, poor nutrition, greater risk of heart disease and stroke, affected glucose mechanism, risk of diabetes, and low immunity. In a pandemic situation, body physiology gets changes according to the external environment that will affect the person's overall health. In that situation, everyone has to make a diet plan as per the suitability of the person. Proper diet planning includes good food habits, nutritional food, a wholesome diet, an easily digested diet, low calorie healthy diet, and a timetable of breakfast, lunch, and dinner. Dietary and behavioral measures include the type of diet, time of consumption, the interval between intake of food, the quantity of intake (should be one-third of stomach capacity), and nutrition values. The central concept of diet in Ayurveda includes three types of diet Satvik, Rajas, and Tamas; a person should consume a diet accordingly to keep equilibrium for sustenance and good health management strong relation between gut health and mind. Whole things are interconnected; scheduling and management play a significant role in the pandemic situation for good health. Perhaps Ayurveda teaches us an important lesson that our health is up to us, how to live every day and every hour, choose either health or illness, opt for sound options, and think-rethink our choices [15].

7. Role of diet and behavior in health security

The awareness regarding diet and behavior is essential for health security, which is excellently elaborated in the Ayurveda context. The dietary pattern related to various ages is also explained in the literature. The adolescent age group is very vulnerable to food choices responsible for growing age health related problems.

Consciousness and knowledge about recommended food and nutrition may reduce the risk in growth and development. There should be a feedback system in adolescent age for nutrition knowledge and healthy behavior. Simultaneously, the pregnant woman is the weaker part of society. She needs the intervention of more nutritious diets and healthy habits that improve her health and reflections on a healthy baby. There should be one unique health plan related to pregnant women, which should be developed and validated regularly for the part of the government's health care mechanism. The dietary interventions affect the gut microflora composition and their function, reducing the risk of various diseases. Another concept related to the drug delivery system of bioactive components through nanotechnology plays a vital role in health promotion, health security, and disease prevention. In this method, one can increase bioactive compounds' bio-availability at various stages of digestion, absorption, and assimilation. In old age people, the most significant risk factor is neurodegenerative diseases due to calorie restrictions and intermittent fasting. According to age and Prakriti and behavioral guidelines, a health regulatory body should unanimously frame a comprehensive diet plan [16–21].

8. Initiatives for international health security

The health streams like Ayurveda, Modern medicine, Homeopathy, Siddha, Unani, etc., are solutions to health-related problems. The global health community has to determine health crisis problems and strategic level integrated models with disaster defender system which can enhance global capacities and capabilities for infectious diseases. The complementary sciences can help community-based contextual issues effectively and maybe the part of more decisive strategic planning in the outbreak of contagious diseases for strengthening the immune system of the society. The global health leadership, WHO must formulate strong international health regulations treaty and country-wise administration, considering bottom line community no longer been deprived of health providers in disaster situations. WHO should develop a global response system for crisis response and risk reduction worldwide to collaboratively take opinion of practitioners and health care decision-makers in various fields irrespective of the health care system [22–25].

9. Conclusion

The Ayurveda plays a significant role in managing diet and behavior, advised ingesting, according to Prakriti, Koshta, and Agni, considering the daily and seasonal changes for health security. A person has to take the proper diet recommended to their Prakriti in a pandemic situation and ensured activities with exercise are suggested in the prescribed period.

Conflict of interest

The authors declare no conflict of interest.

Appendices and nomenclature

Aakash
Agni

Aether
Digestive power, biological energy

Agni	Fire principle
Ahara	Diet
Ashti	bones, bony part, and skeleton
Ayush	life principle
Bio-humors	Tridosha (Vata, Pitta, Kapha)
Dhatus	body tissue
Jala	Water principle
Koshta	bowel movement type
Kura koshta	hard bowel
Madhyam koshta	moderate bowel
Majja	marrow, bone marrow
Mamsa	musculature, tendons, muscular system
Manda Agni	Hypometabolism
Meda	fat, fat-like structures, adipose tissues,
Mrudu koshta	soft bowel
Panchamahabhut	five elements - (Akash, Vayu, Agni, Jala, and Prithvi)
Prithvi	Earth principle
Rakta	blood and related circulatory system
Rasa	final metabolic juice and plasma-derived from the diges- tive system
Sama Agni	balanced state of metabolism
Shukra	structurally and functionally related to the male and female reproductive system
Tikshna Agni	Hypermetabolism
Vayu	Air principle
Veda	Knowledge
Vihar	Exercise/Movements/behaviour
Vishama Agni	Irregular Metabolism

Author details

Gaurav Sawarkar* and Punam Sawarkar
Mahatma Gandhi Ayurved College, Hospital and Research Centre, Constituent
Unit of Datta Meghe Institute of Medical Sciences (Deemed to be University),
Wardha, Maharashtra, India

*Address all correspondence to: drsawarkar.gaurav@gmail.com

IntechOpen

© 2021 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

References

- [1] Disha Bhatero, Punam Sawarkar, Gaurav Sawarkar, Indian Lifestyle with Ayurveda Perspective During Covid-19 Pandemic, *International Journal of Research in Pharmaceutical Sciences*, Dec 2020, 11(special I):1396-1399
- [2] Malik, Kusum, & Brijesh Mishra. "Panchamahabhuta - Aadharbhut Siddhant And Their Application In Chikitsa." *Journal of Ayurveda and Integrated Medical Sciences (ISSN 2456-3110)*, 3.5 (2018): 146-150
- [3] Srivastava K. Concept of personality: Indian perspective. *Ind Psychiatry J*. 2012;21(2):89-93. doi:10.4103/0972-6748.119586
- [4] Hankey A. Establishing the Scientific Validity of Tridosha part 1: Doshas, Subdoshas and Dosha Prakritis. *Anc Sci Life*. 2010 Jan;29(3):6-18. PMID: 22557353; PMCID: PMC3336287.
- [5] Sharma, V., & Chaudhary, A. K. (2014). Concepts of Dhatu Siddhanta (theory of tissues formation and differentiation) and Rasayana; probable predecessor of stem cell therapy. *Ayu*, 35(3), 231-236. <https://doi.org/10.4103/0974-8520.153731>
- [6] A physiological appraisal of the concept of Srotas with special reference to Respiratory Physiology, January 2015, DOI: 10.13140/2.1.1120.8005
- [7] Patwardhan et al., Ayurveda, and traditional Chinese medicine: a comparative overview. *Evidence-based Complement. Altern. Med.*, 2005; 2, 465-473.
- [8] Patil VC, Baghel MS, Thakar AB. Assessment of Agni (Digestive function) and Koshtha (Bowel movement with special reference to Abhyantara snehana (Internal oleation). *Anc Sci Life*. 2008;28(2):26-28.
- [9] Agrawal AK, Yadav CR, Meena MS. Physiological aspects of Agni. *Ayu*. 2010;31(3):395-398. doi:10.4103/0974-8520.77159
- [10] Kumar S. (2014) The Concept of Diet in Ayurveda and Its Implications for the Modern World. In: Rastogi S. (eds) *Ayurvedic Science of Food and Nutrition*. Springer, New York, NY. https://doi.org/10.1007/978-1-4614-9628-1_3
- [11] Agrawal AK, Yadav CR, Meena MS. Physiological aspects of Agni. *Ayu*. 2010;31(3):395-398. doi:10.4103/0974-8520.77159
- [12] Ankita Thakur, Brij Kishor, Akhilesh. K. Srivastava, Rajesh Manglesh. Concept and Significance of Agni in Ayurveda. *International Journal of Ayurveda and Pharma Research*. 2018;6(9):76-80.
- [13] Sabnis M. Viruddha Ahara: A critical view. *Ayu*. 2012;33(3):332-336. doi:10.4103/0974-8520.108817
- [14] Payyappallimana, Unnikrishnan, and Padma Venkatasubramanian. "Exploring Ayurvedic Knowledge on Food and Health for Providing Innovative Solutions to Contemporary Healthcare." *Frontiers in public health* vol. 4 57. 31 Mar. 2016, doi:10.3389/fpubh.2016.00057
- [15] Ayushi Sunil Lohi, Gaurav Sawarkar. Management of Diet During Covid-19 Pandemic. *ijrps*. 2020Jun.22;11(SPL1):154-7. Available from: <https://pharmascope.org/ijrps/article/view/2295>
- [16] Jones LJ, VanWassenhove-Paetzold J, Thomas K, Bancroft C, Ziatyk EQ, Kim LS, Shirley A, Warren AC, Hamilton L, George CV, Begay MG, Wilmot T, Tsosie M, Ellis E, Selig SM, Gall G, Shin SS. Impact of

a Fruit and Vegetable Prescription Program on Health Outcomes and Behaviors in Young Navajo Children. *Curr Dev Nutr.* 2020 Jul 21;4(8):nzaa109. doi: 10.1093/cdn/nzaa109. PMID: 32734135; PMCID: PMC7377262.

[17] Donsì F, Ferrari G. Changing the Vision in Smart Food Design Utilizing the Next Generation of Nanometric Delivery Systems for Bioactive Compounds. *Foods.* 2020 Aug 12;9(8):1100. doi: 10.3390/foods9081100. PMID: 32806512; PMCID: PMC7465260.

[18] Attaye I, Pinto-Sietsma SJ, Herrema H, Nieuwdorp M. A Crucial Role for Diet in the Relationship Between Gut Microbiota and Cardiometabolic Disease. *Annu Rev Med.* 2020 Jan 27;71:149-161. doi: 10.1146/annurev-med-062218-023720. Epub 2019 Oct 3. PMID: 31479620.

[19] Chung LMY, Fong SSM. Role of behavioural feedback in nutrition education for enhancing nutrition knowledge and improving nutritional behaviour among adolescents. *Asia Pac J Clin Nutr.* 2018;27(2):466-472. doi: 10.6133/apjcn.042017.03. PMID: 29384337.

[20] Morris T, Strömmer S, Vogel C, Harvey NC, Cooper C, Inskip H, Woods-Townsend K, Baird J, Barker M, Lawrence W. Improving pregnant women's diet and physical activity behaviours: the emergent role of health identity. *BMC Pregnancy Childbirth.* 2020 Apr 25;20(1):244. doi: 10.1186/s12884-020-02913-z. PMID: 32334540; PMCID: PMC7183631.

[21] Wahl D, Cogger VC, Solon-Biet SM, Waern RV, Gokarn R, Pulpitel T, Cabo Rd, Mattson MP, Raubenheimer D, Simpson SJ, Le Couteur DG. Nutritional strategies to optimise cognitive function in the aging brain. *Ageing Res Rev.* 2016 Nov;31:80-92. doi: 10.1016/j.

arr.2016.06.006. Epub 2016 Jun 26. PMID: 27355990; PMCID: PMC5035589.

[22] Zinsstag J, Crump L, Schelling E, Hattendorf J, Maidane YO, Ali KO, Muhummed A, Umer AA, Aliyi F, Nooh F, Abdikadir MI, Ali SM, Hartinger S, Mäusezahl D, de White MBG, Cordon-Rosales C, Castillo DA, McCracken J, Abakar F, Cercamondi C, Emmenegger S, Maier E, Karanja S, Bolon I, de Castañeda RR, Bonfoh B, Tschopp R, Probst-Hensch N, Cissé G. Climate change and One Health. *FEMS Microbiol Lett.* 2018 Jun 1;365(11):fny085. doi: 10.1093/femsle/fny085. PMID: 29790983; PMCID: PMC5963300.

[23] Ravi SJ, Meyer D, Cameron E, Nalabandian M, Pervaiz B, Nuzzo JB. Establishing a theoretical foundation for measuring global health security: a scoping review. *BMC Public Health.* 2019 Jul 17;19(1):954. doi: 10.1186/s12889-019-7216-0. PMID: 31315597; PMCID: PMC6637489.

[24] Burkle FM Jr. Global Health Security Demands a Strong International Health Regulations Treaty and Leadership From a Highly Resourced World Health Organization. *Disaster Med Public Health Prep.* 2015 Oct;9(5):568-580. doi: 10.1017/dmp.2015.26. Epub 2015 Feb 18. PMID: 25690046.

[25] Burkle FM Jr. Challenges of Global Public Health Emergencies: Development of a Health-Crisis Management Framework. *Tohoku J Exp Med.* 2019 Sep;249(1):33-41. doi: 10.1620/tjem.249.33. PMID: 31548492.