



Study the Meteorological Environment on Physical and Mental Well-Being (Ayurveda and Modern View)- A Conceptual Study

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Authors' contributions

This work was carried out in collaboration among all authors. Author ABD designed the study, managed the literature searches, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author BLE managed, literature searches, the data collecting and Author WMSSKK managed the analyses of the study. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: *Ritucharya* (seasonal regimen) have been mentioned in the classics of Ayurveda. According to Ayurveda *tridoshas* (Three body humors) plays important role in maintaining physiological state of an individuals. But *chaya*(Accumilation), *prakopa*(Unbalanced) and *prasmana*(Balanced) of *doshas* takes place naturally by seasonal changes. A year is divided into 2 *Kaals* (time periods-*Uththarayanaya/Adana kaal* and *Dakshinayanaya/Visaraga kaal*). Each *Kaal* comprises of 3 seasons which gives a total of 6 seasons in a year. Each season lasts for two months The impacts of climate change include warming temperatures, changes in precipitation, increases in the frequency or intensity of some extreme weather events, and rising sea levels. These impacts threaten our health by affecting the food , the water, the air and the weather we experience.

Objectives: To identify the Meteorological environment on Physical and Mental well-being (Ayurveda and Modern view)

Methodology: Literature review was done from classical Ayurvedic texts,web references and modern literature regarding selected Scientific Research articles published in PubMed, Research

gate, Google scholar, Science direct, Elsevier, Cochrane library and PMC, including health impact of meteorological changes.

Results: According to Ayurveda *tridoshas* plays important role in maintaining physiological state of an individuals. But *chaya*, *prakopa* and *prasma* of *doshas* takes place naturally by seasonal changes. In the beginning of *visarga kala* and at the end of *adana kala*, human beings on the Earth experience weakness. In the middle of these two periods, humans possess medium strength. At the end of the *visarga kala* and at the beginning of *adana kala* the strength in human beings is maximum. The impacts of climate change include warming temperatures, changes in precipitation, increases in the frequency or intensity of some extreme weather events, and rising sea levels. These impacts threaten our health by affecting the food we eat, the water we drink, the air we breathe, and the weather we experience.

Conclusion: Lifestyle disorders are very common in the present era, basically originating from lack of following seasonal regimens due to lack of concentration in seasonal characteristics. In this study reflect that meteorological environment effect on both physical and mental health.

Keywords: Ayurveda; meteorology; seasonal regimen.

1. INTRODUCTION

Ayurveda is the age old science of life, has always emphasized to maintain the health and prevent the diseases by following proper diet and lifestyle regimen rather than treatment and cure of the diseases. The basic principle followed in the Ayurvedic system of medicine is “*Swasthyashya Swasthya Rakshanam*,” which means to maintain the health and “*Aturashya Vikara Prashamanancha*”, means to cure the diseases. For maintain the health the *Dinacharya* (daily regimen) and *Ritucharya* (seasonal regimen) have been mentioned in the classics of Ayurveda. *Ritucharya* is prominently discussed in the first few chapters of most of the *Samhitas* of Ayurveda. Prevention of disease to maintain health is being the first and foremost aim of the holistic science of Ayurveda. In *Tasyashitya* chapter of Charaka Samhita, it is said “*Tasya Shitadiya Ahaarbalam Varnascha Vardhate. Tasyartusatmayam Vaditam Chestaharyapasrayam*,” which means “the strength and complexion of the person knowing the suitable diet and regimen for every season and practicing accordingly are enhanced. Main theme of this chapter is to make people aware concerning the methods to live in accordance with the environment. [1]

Rituacharya is the ancient Ayurvedic practice and is comprised of two words, “*Ritu*” which means season and “*charya*” which means Regimen or discipline. *Ritucharya* consists of lifestyle and Ayurvedic diet routine to cope with the bodily and mental impacts caused by seasonal changes as recommended by Ayurveda. *Ritucharya* enables us to build our

physical strength and mental capability to battle ailments that may happen due to seasonal changes. In addition to that, it balances all the three *doshas* in our body and keeps us fit and healthy throughout the year.

Lifestyle diseases are a result of an inappropriate relationship of people with their environment.

A year is divided into 2 *Kaals* (time periods). Each *Kaal* comprises of 3 seasons which gives a total of 6 seasons in a year. Each season lasts for two months [2].

1.1 Objectives

- 1) To identify the Meteorological changes on Physical well-being in Ayurveda and Modern Medicine
- 2) To identify the Meteorological changes on mental well-being in Ayurveda and Modern Medicine

2. METHODOLOGY

Literature review was done from classical Ayurvedic texts, web references and modern literature regarding selected Research articles including health impact of meteorological changes and Ayurveda and Modern Medicine. Then analyze of Research articles PubMed, Research gate, Google scholar, Science direct, Elsevier, Cochrane library and PMC including health impact of meteorological changes in Ayurveda and Modern Medicine.

3. RESULTS

According to the Ayurveda year is divided into 2 *Kaals* (time periods-*Uththarayanaya/Adana kaal*

and *Dakshinayanaya/Visaraga kaal*). Each *Kaal* comprises of 3 seasons which gives a total of 6 seasons in a year.

3.1 Seasonal Variation in Strength

In the beginning of *visarga kala* and at the end of *adana kala*, human beings on the Earth experience weakness. In the middle of these two periods, humans possess medium strength. At the end of the *visarga kala* and at the beginning of *adana kala* the strength in human beings is maximum [2].

According to Ayurveda *tridoshas* plays important role in maintaining physiological state of an individuals. But *chaya*, *prakopa* and *prasmana* of *doshas* takes place naturally by seasonal changes [4].

3.2 Aadaan Kaal/ Northern Solstice/ Uttaryana

During this season, the sun and the wind are extremely powerful. The Sun wards off all the energy and strength from people, and the cooling qualities from the earth. The scorching sun gives balmy and parched qualities to plants and humans. Thereby, reducing the strength among individuals.

3.3 Diet and lifestyle guidelines in Hemanta ritu (Winter season)

During *sheeta kala (hemanta)* due to the contact of cold wind, the *agni* (digestive power) of strong/healthy individuals gets trapped in the body (like in a closed chamber) and becomes

strong or powerful enough to digest food that is inherently heavy and excess in quantity.

If adequate food is not made available to the body, then this increased *agni* consumes/absorbs the *rasa*(the intrinsic fluids of the body). *Vata* having *sheeta* (cold) property gets vitiated in this cold season.

3.4 Diet and Beverages in Winter Season

In the period of snowfall, unctuous, sour and salty food items should be consumed predominantly. Meat of fatty, aquatic and marshy animals should be taken. Meat of burrowing animals and roasted meat of animals that eat by snatching the prey should be consumed and after that drinking of *madira* and *sidhu* type of wines and honey is advised.

A person who is habituated to consuming milk products, cane sugar products, fats and oils, new rice and warm water during *hemanta ritu*, never sees his lifespan decrease (i.e. these help in prevention from early aging and diseases).

3.5 Lifestyle in Winter Season

In *hemanta ritu*, *abhyanga* (massage), *utsadana* (anointing), *murdhni taila* (applying oil on the head), fomentation by *jentaka* (a type of fomentation/sudation) method, sunbath, spending time in hot underground houses and warmer, inner rooms of the house is indicated. In winter season, vehicles, beds and seats should be well covered and spread over with thick quilts, deer or tiger skins, silken sheets, gunny-cloth sheets or blankets.

Table 1. Time period of the Sanvathsararupee kaal(Year)

Sanvathsararupee kaal(Year)	Ritu	Season	Time period
Aadaan Kaal/ Northern Solstice/ Uttaryana (14 January to 14 July)	Shishir Ritu	Winter	Mid-January to Mid-March
	Vasant Ritu	Spring	Mid-March to Mid-May
	Grishma Ritu	Summer	Mid- May to Mid- July
Visaraga Kaal/ Southern Solstice/ Dakshinayana (14 July to 14 January)	Varsha Ritu	Monsoon	Mid- July to Mid-September
	Sharad Ritu	Autumn	Mid-September to Mid-November
	Hemantha Ritu	Pre-winter	Mid - November to Mid- January[3]

Table 2. Relationship with *Thridosha* and *Rithu*

Dosha	Chaya	Prakopa	Prasama
Vata	Greeshma	Varsha	Sharad
Pita	Varsha	Sharad	Hemantha
Kapha	Shishira	Wasantha	Greeshma

Table 3. Effect of unbalance of *Thridosha*

Effect of Unbalanced (<i>prakopa</i>) <i>Vatha</i>	Effect of Unbalanced (<i>prakopa</i>) <i>Pita</i>	Effect of Unbalanced (<i>prakopa</i>) <i>Kapha</i>
Bodily functions impaired	Poor digestion.	Poor nutritional status,
Movements for eating, digestion, and excretion inhibited.	Inefficient discrimination between nutrients and wastes	thin, flabby, Dry; decreased mucus and saliva
Mental inactivity and confusion; impaired memory.	Irregular body temperature	Loose joints
Perception and action are disturbed; senses are dulled, responses are slowed.	Impaired vision	Soft and weakened physique
Stimulation of digestive j	Skin colour variable, inflamed, unhealthy; premature greying	Sexual impotency
Deficiency of digestive juices	Anxious, irritable, driven	Intolerant, insecure, jealous
Desire to lead an active life; vitality and natural interest	Dullness of reasoning faculty	Slow digestion
Loss of energy and joy for life	Spiritually impoverished	Excess production of mucus
Normal drying of excessive discharges	Heartburn, peptic ulcer, irritable bowels, diarrhoea	
Persistent bodily discharges		
Normal respiratory function Respiratory disorders		
Normal sleep pattern		
Insomnia, interrupted sleep		
Excellent energy level		
Non-specific fatigue, anxiety, worry, cold-intolerance, weakening of the Life Force [5]		

Table 4. Ritus with their relation with predominant elements (*Mahabhutas*), doshas and taste (*Rasas*) [6]

Ritu	Predominant elements in nature	Predominant rasa	Dosha generation kala	Dosha regression kala
Shishir Ritu (Winter)	Vayu, Akasha	Thikata (Bitter)	Vata	Pita, Kapha
Vasant Ritu (Spring)	Vayu, Prithvi	Kashaya (Astringent)	Vata	Pita, Kapha
Grishma Ritu (Summer)	Vayu, Teja	Katu (Pungent)	Vata, Pitta	Kapha
Varsha Ritu (Monsoon)	Prithvi, Teja	Amla (Sour)	Kapha, Pitta	Vata
Sharad Ritu (Autumn/ Fall)	Ape, Teja	Lavana (Salty)	Kapha, Pitta	Vata
Hemantha Ritu (Pre-winter)	Prithvi, Ape	Madhura (Sweet)	Kapha	Pita, Vata

3.6 Guidelines for Sexual Health

In the winter season, one should always wear thick and warm clothes and the body should be anointed with thick paste of *aguru* (*Aquilaria agallocha* Roxb) (eagle-wood). A man who has

strong passion should sleep in the bed at night embracing a healthy woman having well developed, plump breasts and herself anointed with the paste of *aguru*. One may indeed indulge in sexual intercourse up to full satisfaction.

3.7 Contra-indications in Winter Season

At the advent of winter season intake of food and drinks that cause *vata* vitiation and inherently light to digest in property, (getting exposed to) strong winds, inadequate quantities of food, and intake of diluted gruel are contraindicated [7].

3.8 Diet and Lifestyle Guidelines in Shishira Ritu (late winter)

Hemanta and *shishira* seasons are almost similar in characteristics with some specific features in *shishira ritu*. In this season, due to the onset of *adana kala*, dryness increases and due to clouds, winds and rain, cold prevails. Therefore, the whole regimen advised for *hemanta* should also be followed in *shishira ritu*. In addition to that, one should specially stay in less windy and warm shelters (homes).

3.9 Contra-indication in Late Winter

In the *shishira* season, food and drinks that are predominantly pungent, bitter and astringent in taste, *vata* vitiating, and inherently light to digest and cold in properties should be avoided [8].

3.10 Diet and Lifestyle Guidelines in Vasanta Ritu (Spring Season)

3.10.1 Status of agni in spring

Shleshma accumulated in *hemanta ritu* gets liquefied by hot rays of the Sun in *vasanta ritu*, which in turn disturbs/decreases the digestive power and ultimately causes many diseases

3.10.2 Indications and contra-indications in spring

Therefore in *vasanta* season the purification procedures like *vamana* (therapeutic emesis) and others should be done. One should avoid heavy to digest, sour, unctuous and sweet food items and should not sleep during the daytime. In *kusumagama kala* (at the advent of spring) when flowers blossom (*vasanta*) one should regularly resort to physical exercise, dry massage, medicated smoking, gargling, and collyrium. Bathing and cleaning of excretory orifices should be done with lukewarm water. A person should apply the paste of *chandana* (*Santalum album* Linn) and *aguru* (*Aquilaria agallocha* Roxb) (eagle-wood) on the body. One should take food made up of barley and wheat, meat (eg *shasha*-Rabit.).

One should drink clean alcoholic drinks like *sidhu* and *madhvika* (types of wine preparations) in *vasanta* and enjoy the youthfulness of women and of gardens [9].

3.1 Diet and Lifestyle Guidelines in Grishma Ritu (Summer Season)

Effect of excess Sun-heat in summer.

In *grishma ritu* (summer season), the Sun, by its rays, excessively dries up the environment. So, in this season, food and drinks having sweet, cold, liquid and unctuous qualities are considered wholesome.

3.12 Diet and Beverages in Summer

In summer season, any individual taking cold and sweet *mantha* (a type of liquid diet), meat of wild animals and birds, ghee and milk with *shali* rice (*Oryza sativa* Linn) does not become weak (i.e., does not suffer from diseases).

3.13 Contra-indications in Summer

Alcoholic beverages should be consumed in little quantities or should not be consumed at all, or if taken, should be diluted with plenty of water. One should not consume salty, sour, pungent and hot food, and physical exercise should be avoided.

3.14 Lifestyle in Summer

During daytime, one should sleep in a cool shelter and during night after applying the paste of *chandana* (*Santalum album* Linn) on the body sleep in the airy roof/terrace of the house which is cooled by the Moon-rays. One should be seated on a surface decorated with pearl and gems and make use of a fan and touching by soft hands, both cooled with sandal water. In Summer, one should enjoy the coolness of gardens, cold water and flowers, and should abstain from sexual intercourse [10].

3.15 Diet and Lifestyle Guidelines in Varsha Ritu (Rainy Season)

3.15.1 Status of agni in rainy season

In a weak body, during the period of dehydration, *agni* is also weak, and deteriorates further due to vitiated *vata* and other *dosha* during rainy season. In this season, due to evaporating vapors from the Earth, rainfall and acidic transformation of water, the *agni* is

weakened, thus leading to the further vitiation of *vata* and other *dosha*.

3.15.2 Indications and contra-indications in rainy season

Hence, in rainy season all basic rules regarding diet and lifestyle are advised to balance all three *dosha*. One should avoid diluted *mantha* (excess liquid diet), sleeping during the day, exposure to dew, river water, physical exercise, sun rays and sexual intercourse in this season. One should use food and drinks mostly added with honey in small quantity to pacify the *kleda* (moisture) of rainy season.

3.15.3 Specific diet in rainy season

In the rainy season when the days are cooler due to wind and rain, one should predominantly take sour, salty and unctuous food to alleviate *vata*. A person taking care of his *agni* should consume old barley; wheat and *shali* rice (*Oryza sativa* Linn) along with meat of wild animals and processed soup. Whenever *madhvika* or other fermented liquors and water are consumed, they should be mixed with a little amount of honey. Rain water or water from wells or ponds should be properly boiled and cooled.

3.15.4 Lifestyle in rainy season

In the rainy season, one should practice *pragharsha* (friction massage), *udwartana* (dry massage), *snana* (bath), use of fragrance, garlands, wearing light and clean clothes and should reside in the place which is free from humidity [11]

3.16 Diet and Lifestyle Guidelines in Sharada Ritu (Autumn Season)

When a body habituated to cold and rain is suddenly subjected to the heat of sun-rays in the *sharada* (autumn) season, the accumulated pitta *dosha* in the body often gets aggravated.

3.17 Specific Diet for Pacification of Pitta Dosh

In this season food and drinks predominantly of sweet, light, cold and slightly bitter qualities and having pitta alleviating properties should be taken in proper quantity, only when there is good appetite. In *ghanatyaya* (*sharada ritu*), the meat

of *lava* (common quail), *kapinjala* (grey partridge), *ena* (antelope), *urabhra* (sheep), *sharabha* (wapiti) and *shasha* (rabbit), *shali* rice (*Oryza sativa* Linn), barley and wheat should be taken. In *sharada*, whenever the rain clouds disappear, the intake of *tikta* ghee (ghee medicated with bitter items), use of purgatives, and blood-letting are indicated.

3.18 Contra-indications in Autumn Season

In this season exposure to Sun, intake of muscle fats and oils, exposure to dew, meat of aquatic and marshy animals, alkaline preparations, and curd are contraindicated. One should not sleep during daytime and restrict exposure to easterly wind. Water naturally heated with sunrays during daytime and cooled with moon rays during night, well purified by the course of time and detoxified by the effects of *Agastya* (the star Canopus) is called *Hamsodaka*. This is available during *sharada* and is clean and clear. This water is beneficial as nectar when used for the purpose of bathing and drinking

3.19 Lifestyle during Autumn Season

In *sharada ritu*, garlands of seasonal flowers, clean clothes (apparels), and exposure to moon-rays in early nights are very beneficial [12,13]

3.20 Rithu Sandhi

During this period, the regimen of the preceding season should be discontinued gradually and that of the succeeding season should be gradually adopted; sudden discontinuance or sudden adoption gives rise to diseases caused by *Asatmya* (non-habitation) [14].

According to the Modern medicine skin disease, depression are more common in summer as well as Diarrhea and fever in Monsoon, Respiratory tract infections in Winter, and Arthritis, Stroke, in Spring.

The impacts of climate change include warming temperatures, changes in precipitation, increases in the frequency or intensity of some extreme weather events, and rising sea levels. These impacts threaten our health by affecting the food we eat, the water we drink, the air we breathe, and the weather we experience.

Table 5. Modern view

Title	Author and year	Type of Research	Findings
1)Influence of seasonal changes on disease activity and distribution of affected joints in rheumatoid arthritis	HiroakiMori et,al(2019)	Observational study	Rheumatoid arthritis activity in the upper and lower extremities may be highest in spring, followed by winter..
2)The effects of seasonal climate variability on dengue annual incidence in Hong Kong: A modelling study	Hsiang-Yu Yuan et,al (2020)	Observational study	Dengue was mostly appeared in the latter half of the year starting in summer
3)Association between winter season and risk of death from cardiovascular diseases: a study in more than half a million inpatients in Beijing, China	Beibei Xu et al (2013)	Observational study	Winter season was associated with a substantially increased risk of cardiovascular death among older Chinese cardiovascular inpatients
4)Monsoon weather and early childhood health in India	Anna Dimitrova et al,(2020)	Observational study	During the monsoon season, is associated with an increased risk of contracting diarrhoea among children under five. Diseases transmitted through water, such as diarrhoea, could be one important channel through which excessive rainfall increases the risk of stunting
5)Thrombocytopenia due to monsoon related illness: as an underestimated cause of maternal mortality and morbidity	Pallavi Amol Kharat et al (2020)	Randomized clinical trial	Monsoon fever with thrombocytopenia requires early diagnosis and optimal treatment to reduce maternal mortality and to avoid adverse fetal outcome.
6) Summer, sun and sepsis—The influence of outside temperature on nosocomial bloodstream infections: A cohort study and review of the literature	Frank Schwab et al (2020)	The retrospective cohort study	In warmer months for both the number and types of organisms found in the environment, and colonization of human skin. Therefore Skin lesions are more common in summer.
7)Higher stroke incidence in the spring season regardless of conventional risk factors	Tanvir ChowduryTurin et al(2020)	The retrospective cohort stud	Stroke incidence to be highest in Spring seasons among the Japanese population
8) Seasonality of mood and affect in a large general population sample	WimH.Winthorst Et al2020)	Randomized clinical trial	lower on depressive symptoms in spring compared to summer, autumn and winter.
9) Perceived Influence of Weather Conditions on Rheumatic Pain in Romania	Adina-Eliza Croitoru Et al (2019)	The retrospective cohort study	cold ones and winter anticyclonic conditions, greatly intensify the rheumatic pain, whereas summer anticyclonic conditions usually lead to a decrease in pain severity.
10) Burden, seasonal pattern and symptomatology of acute respiratory illnesses with different viral aetiologies in children presenting at outpatient clinics in Hong Kong	L.WeI et al(2015)	Randomized clinical trial	The seasonality pattern varied among different viruses, with influenza virus A being the predominant virus detected in winter, and enterovirus/rhinovirus being more commonly detected than influenza virus A in the other three seasons

The severity of these health risks will depend on the ability of public health and safety systems to address or prepare for these changing threats, as well as factors such as an individual's behavior, age, gender, and economic status. Impacts will vary based on a where a person lives, how sensitive they are to health threats, how much they are exposed to climate change impacts, and how well they and their community are able to adapt to change.

People in developing countries may be the most vulnerable to health risks globally, but climate change poses significant threats to health even

in wealthy nations such as the United States. Certain populations, such as children, pregnant women, older adults, and people with low incomes, face increased risks.

Although global warming may bring some localized benefits, such as fewer winter deaths in temperate climates and increased food production in certain areas, the overall health effects of a changing climate are overwhelmingly negative. Climate change affects many of the the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter.

Table 6. Meteorological changes and Health impact

Climate change	Health impact
Warming temperatures	heat-related deaths heat stroke and dehydration, Higher air temperatures can increase cases of <i>Salmonella</i> and other bacteria-related food poisoning because bacteria grow more rapidly in warm environments. These diseases can cause gastrointestinal distress and, in severe cases, death stress Vulnerable groups: outdoor workers, student athletes, and homeless people, Low-income households, pregnant women, older adults, and people with certain medical conditions, urban populations, firefighters, and transportation workers,
Reduced temperatures	Cold-related deaths
Warmer temperatures worsen air quality	Asthma attacks and other respiratory and cardiovascular health effect Higher sea surface temperatures will lead to higher mercury concentrations in seafood, and increases in extreme weather events will introduce contaminants into the food chain
Increases in Ozone (increase the frequency of days with unhealthy levels of ground-level ozone, a harmful air pollutant,) warm, stagnant air tends to increase the formation of ozone, climate change is likely to increase levels of ground-level ozone	Ground-level ozone can damage lung tissue, reduce lung function, and inflame airways. This can aggravate asthma or other lung diseases. Children, older adults, outdoor workers, and those with asthma and other chronic lung diseases are particularly at risk, premature deaths
Wildfire Smoke can often be carried very long distances by the wind, affecting people who live far from the source of this air pollutant.	Smoke can often be carried very long distances by the wind, affecting people who live far from the source of this air pollutant, Allergic illnesses, including hay fever,
Flooding, droughts, and storms, heavy rains	Gastrointestinal illness like diarrhea, effects on the body's nervous and respiratory systems, or liver and kidney damage. Extreme events, such as flooding and drought, create challenges for food distribution if roads and waterways are damaged or made inaccessible [15]

4. DISCUSSION

4.1 Impact of Physical Health

Effect of meteorological changes on health were well described in Ayurveda as well as Modern medicine. The prominent *Doshas* during the time of conception has definite role in the formation of *Prakruthi* during conception. If the time predominates the *Vatha dosha*, there must be certain qualities of *Vata Dosha*, even though the conjugating *Sukra* and *Shonitha* may be in different *Doaha*. Therefore naturally effect the *kala* on the *Prakruthi* is unavoidable [16].

The average metabolic responses during cold exposure were significantly higher when compared to the summer. Therefore according to the Ayurveda *Agni* is increased. As well as summer due to increase of temperature rapid drops of Blood PH, blood pressure, Urination volume and tissue permeability.

Medical disorders such as bronchitis, peptic ulcer, adrenal ulcer, glaucoma, goiter, eczema and herpes zoster are related to seasonal variations in temperature [27]. Humidity has also a considerable influence on morbidity in the winter because cold, dry air leads to excessive dehydration of nasal passages and the upper respiratory tract and increased chance of viral and microbial infection. Also Study suggested that the liver function tests show seasonal variations [17].

Changing seasonal and environmental factors, such as temperature, sunlight, rain, wind and humidity has a direct link with the increasing number of infectious diseases. Correspondingly, respiratory syncytial virus epidemics occur in the colder months of winter and spring in the United States. While respiratory syncytial virus epidemics are significantly correlated with the hotter months in Singapore. Rain moistens the mucosa, therefore decreasing the spread of the organism by dust. The change of environmental factors influence the host susceptibility to infection, either as a result of seasonal changes on host immune function (humoral and cellular immunity) or as a result of direct environmental effects. Recent experimental studies on rodents, birds and humans suggest that the immune system is weakened during the winter. As well as Hormone secretions are periodic variation release that may also be influenced by seasonal variation. Few studies suggest annual or seasonal variations in hormone concentrations in

man. The mechanism underlying the circannual change in immune function has been linked with adrenocortical hormones activity. Adrenocortical hormones vary on a circannual basis with increased levels of secretion in winter and decrease in summer. One consequence of this variation is a circannual pattern in immune function. Adrenal corticosteroids, especially glucocorticoids, depress cellular immune function and show to be more effective against T-suppressor cells. Thus, when adrenocortical activity is elevated, T-cell activity is depressed and B-cell activity is elevated [18].

Blood plays important role in homeostasis of body. During *sharad ritu* (autumn) blood becomes naturally impure [19]. The effects of biological variations of platelet counts were investigated in three cities of China. Platelet counts in healthy subjects were significantly higher in summer than in winter [20].

Some study suggests that systolic and diastolic blood pressure values differed significantly across the four seasons and according to the distribution of outdoor temperature [21]. Another study shows that uric acid shows seasonal changes. The mean of serum urea was observed maximum (nearer to upper normal limit) in *shishir ritu* and minimum (nearer to lower normal limit) in *greeshma ritu* in all *prakriti* groups [22].

4.2 Impact of Mental Health

Any changes in a person's physical health or surrounding environment can also have serious impacts on their mental health. In particular, experiencing an extreme weather event can cause stress and other mental health consequences, particularly when a person loses loved ones or their home. Even the perceived threat of climate change (for example from reading or watching news reports about climate change) can influence stress responses and mental health. Some groups of people are at higher risk for mental health impacts, such as children and older adults, pregnant and post-partum women, people with pre-existing mental illness (see above), people with low incomes, and emergency workers. Other linkages exist between climate change and human health. For example, changes in temperature and precipitation, as well as droughts and floods, will affect agricultural yields and production. In some regions of the world, these impacts may compromise food security and threaten human health through malnutrition, the spread of

infectious diseases, and food poisoning. The worst of these effects are projected to occur in developing countries, among vulnerable populations. Declines in human health in other countries can affect the United States through trade, migration, and immigration and has implications for national security.

Although the impacts of climate change have the potential to affect human health in the United States and around the world, there is a lot we can do to prepare for and adapt to these changes—such as establishing early warning systems for heat waves and other extreme events, taking steps to reduce vulnerabilities among populations of concern, raising awareness among healthcare professionals, and ensuring that infrastructure is built to accommodate anticipated future changes in climate. Understanding the threats that climate change poses to human health is the first step in working together to lower risks and be prepared [14].

Worse physical or mental health may imply a loss of wages or productivity reducing access to healthier foods and environments. This income effect impacts negatively on mental (or physical) health. Similar negative health effects may also be induced by lack of sleep or stress at work associated with having a mental or physical health condition [23]. As well as life style pattern, nutrition has been implicated in behavior, mood and in the pathology and treatment of mental physical illness.

4.3 Impact of Socio-economy

National Meteorological Services of a country provide meteorological data, information, forecasts and various related products, which are important for the smooth functioning of many aspects in economy, administration and society. Concerning the economic sector, those sub-sectors where weather services are particularly relevant, i.e. agriculture, construction, energy, insurance, telecommunication, tourism, transport, logistics and water availability [23].

Methodological aspects of economic impact assessment are discussed along a temporal and a sectoral dimension. Finally, common economic impact models are compared, analyzing their strengths and weaknesses [24]. Societal and economic research and applications activities can significantly improve understanding of

weather-society interactions to the benefit of the meteorological community and society [25].

5. CONCLUSION

Lifestyle disorders are very common in the present era, basically originating from lack of following seasonal regimens due to lack of concentration in seasonal characteristics. Various regimens in diet and lifestyle were mentioned in the classics of *Ayurveda* and Modern Medicine. Practice of seasonal regimens was important to prevent health impact of meteorological on lifestyle disorders. In this study reflect that meteorological environment affect on both physical and mental health.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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