

CHAPTER-2

Review of Literary

Research from Ancient

Yoga Texts

2.0 REVIEW OF LITERARY RESEARCH FROM ANCIENT YOGA TEXTS

2.1 Introduction

Prevalence of overweight and obesity is increasing worldwide. Obesity and overweight is cause of several non-communicable diseases. The obesity is a multifactorial health disorder and the treatments available in the modern medicine has limitations and side effects (MacDaniels & Schwartz, 2016). Hence more research is desired on obesity within the realm of complementary and alternative medicine (CAM) systems.

The obesity is recognized as a disease in CAM systems such as Ayurveda, Yoga, and Naturopathy. Etiology of obesity and treatments are different in various CAM systems. However these systems have some commonalities. They are holistic, and have an integrated approach in treatment by considering the body and mind together.

The yoga practices were existing in the ancient Indian subcontinent (Chandra, 1994). In the Indus Saraswati valley civilization the terracotta sculptures of Mohenjo-Daro and Harappa had the postures which indicate hints of certain *Āsana*. The *Paśupati* seal discovered in Mohenjo-Daro is having 3 heads and is attributed to Lord *Śivā*, surrounded by animals (Srinivasan, 1984). Further most of Indian ancient scriptures have several references on yoga therapy. The yoga practices are present directly or indirectly in cultural social and religious systems in India.

Yoga is one of the six ancient philosophies of India, which has roots in all walks of life since ancient periods. The awareness on physical exercise was prevalent in ancient India (Mondal, 2013). Apart from ancient Ayurveda texts, medical knowledge was also prevalent in ancient *Veda* texts

and especially in *Atharvaveda* (Narayana, 1995). Further therapy aspects were mentioned in many yoga texts especially in *Hatha* yoga texts like *Haṭhayogapradīpika*.

A study was carried out to find out the obesity aspects discussed in the ancient texts with special reference to ancient yoga texts.

2.2 Aim and Objective

- To search for references of obesity as per ancient *Haṭha* yoga texts
- To study and compile the available literature on obesity, from other traditional yoga scriptures and ancient texts.

2.3 Methodology

The literary search was based on the available traditional literature on yoga. Also it was based on practical knowledge from the experts in the yoga field.

Table- 1 Ancient texts with special reference to *Haṭhayogā* texts

Sl.No.	Texts	Search for
1	<p><i>Vedā</i> and <i>Upaniṣad</i>:</p> <p><i>Ṛgveda</i> <i>Śvetāśvetaropaniṣad</i> <i>Taittiriya Upaniṣad</i> <i>Kaṭha Upaniṣad</i></p> <p><i>Ayurveda</i> texts:</p> <p><i>Caraka Saṁhita</i> <i>Yoga Ratnākara</i> <i>Suśruta Saṁhita</i></p> <p><i>Vedānta</i> texts:</p> <p><i>Pancadaśi</i> <i>Yogavāsiṣṭha</i></p>	<ol style="list-style-type: none"> 1. Aspects of body disorders and natural living in <i>Vedā</i> and ancient texts. 2. Aspects of obesity in Ayurveda texts. 3. Obesity as understood in Naturopathy. 4. Aspects of obesity in ancient Yoga texts. 5. Commonality on understanding of obesity in CAM. 6. Aspects of ‘Away from Nature’ and causes of obesity. <p>No obesity in animals and trees</p>

<p><i>Bhagavat Gīta (BG):</i></p> <p><i>Patanjali Yoga Sutra (PYS):</i></p> <p><i>Haṭhayogā</i> texts:</p> <p><i>Haṭhayogapradīpika (HP)</i> <i>Gheraṇḍa Samhita</i> <i>Śiva Samhita</i> <i>Vaśiṣṭh Samhita</i> <i>Yoga Tarāṅgiṇi</i> <i>Haṭha Ratnāvali</i> <i>Siddhasiddhānta Paddhati/</i> <i>Goorakṣa Śatakam</i> <i>Jogapradīpika</i> <i>Haṭha Tatva Kaumudi</i> <i>Haṭha Saṅkeeta Candrika</i></p>	<p>7. Urban life- ‘Sleep Food Exercise triangle’ the urban life is away from natural life.</p> <p>8. <i>Pancakośa</i> and <i>Yogavāśiṣṭha</i> concepts on disease.</p> <p>9. Aspects of obesity attributes, such as leanness and lightness of the body, laziness, eating disorder and sleeping disorders, sweating, body smell, physical inactivity etc. in the <i>Haṭha</i> yoga texts.</p>
--	--

Table- 2 Concept of obesity aspects in the scriptural/yoga texts

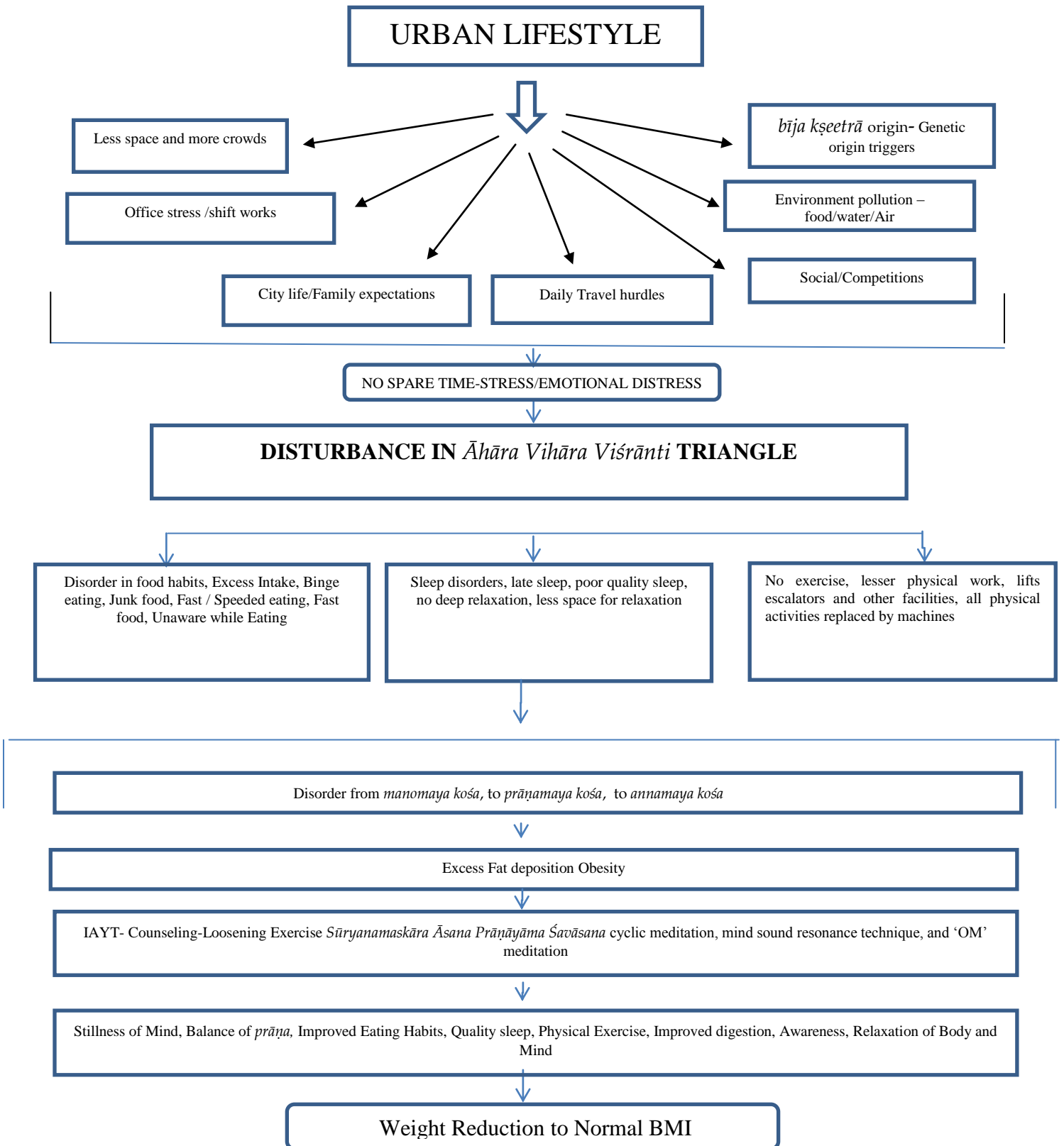
Sl. No.	Attributes of obesity referred
1	Weight and body size aspects, qualities like <i>Añima</i> , <i>Laghima</i> , enlargement of parts/organs etc.
2	References of leanness of body
3	Quality of digestive/gastric power
4	Lethargy and Laziness
5	Eating disorders
6	Excessive hunger and thirst
7	Sweating and bad smell
8	Sleep quality
9	Stillness of mind
10	Disorders of humors like <i>Kapha Doṣa</i>

11	References of fat
12	Philosophical hints on obesity

2.4 Theoretical Model

It is observed that progress in technology is positively correlated with increase in obesity.

Figure-1 Theoretical model



2.5 Literature review

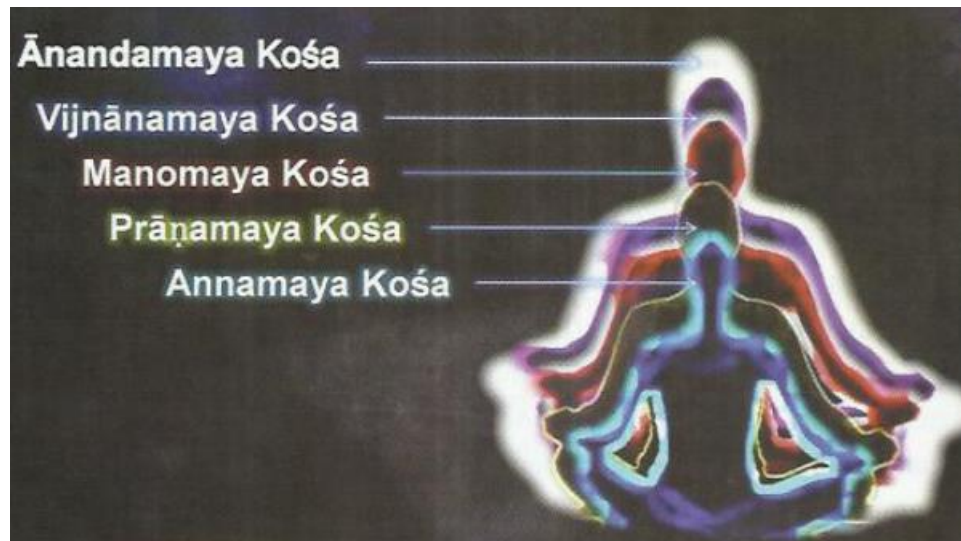
2.51 Vedā Upaniṣad and obesity

The word yoga originates from the Sanskrit word *Yuj*, which means to join or connect. This refers to connecting of individual consciousness to universal consciousness. Yoga means the mastering and controlling of the mind. Lack of mastery over the mind is the source of many diseases.

The *Taittiriya Upaniṣad* defines the five layers in human existence and presents the *Pancakośa* theory.

Figure-2 Pancakośa

(Nagaratna & Nagendra, 2014)



The diseases originate from the mental layer or *Manomaya kośa* due to the excessive excitation of thought flux, which in turn make imbalances of *prāṇa* in *Prāṇamaya kośa*. The imbalance and disharmony will be further transferred to physical body or *Annamaya kośa*.

Many layers of consciousness are addressed by yoga practices and the illness is removed from its origin.

The *Vedā Upaniṣad Upaveda Vedāṅga* (e.g. *Purāṇa Itihāsa*) *Bhagavat Gīta* etc., are huge treasure of knowledge for humanity. Also the yoga texts such as *Haṭhayogapradīpikā* (HP) outline

many references on obesity and its attributes in direct and indirect terms, while detailing the protocol of yoga practices. More than fifteen percentage of the *śloka* (having four lines) of *Haṭhayogapradīpika* contains words which are attributes of obesity.

Thus in the ancient texts there are many aspects relevant to obesity disorder. These texts highlight the requirements of integrated approach of mind body medicine and concept of closeness to the nature.

The treatment of modern medicine is for mainly body and its physical systems which are visible and perceptible. In mind body medicines the treatment is in a holistic way and many levels of consciousness are addressed. The disease is considered as part of mind and body together.

The most sweetener food item, sugar was developed in India and the details of sugar cane cultivation and sugar preparation is described in *Atharv Veda* (Gulati & Misra, 2014). The sugar is energy dense food item, and is closely linked to development of fat. The sugar word is derived from Sanskrit word *śarkara*. The offerings of sweet forms, is a practice since ancient times and sugar has got strong cultural relevance in India. For all the auspicious occasions sweetening the mouth is customary in India. Further the mankind moved away from the nature and natural living. The obesity epidemic started increasing rapidly along with urbanization and technology development. Though ancient India was having sugar and sugar rich food items the obesity increase is of the recent past due to urbanization and life style modifications.

Sugar gives empty calorie (about four Kilo .calorie /gram), without nutrients and the obesity is linked to excessive energy intake. In India obesity is increasing in urban areas due to increased energy dense food intake, due to purchasing power and availability of energy dense foods and lack of physical exercise (Misra & Shrivastava, 2013) due to sedentary life style. In nutshell, all above aspects are part of life style which is away from nature. Traditionally the problem of obesity was

not considered with much importance in India due to concern of under nutrition (Dhurandhar, 2014).

The ancient texts emphasize the natural way of living. The closeness to nature is a concept prevalent in ancient texts. In *R̥gveda*, water is considered as nectar or *amrut* which has medicinal value. It is mentioned that the sins and wrong thoughts of mind is purified by water. Water is one of the five *mahābhūta* or fundamental elements with which the entire universe is made up. In *R̥gveda* it is stated as given below.

अप्स्वन्तरममृतमप्सुभेषजमपामुतप्राशस्तये । देवाभवतवाजिनः ॥ ऋग्वेद - १- २३- १९

Apsvantaramamṛtamapsubheṣajamapāmutaprasāstaye | Devābhavataavājinaḥ | R̥gveda - 1- 23- 19
As per above *sūkta* (Gautam, 2014) the medicines are there within water. The medicine for the

entire universe is within water as said by *Soma and Agni*. Hence the *R̥gveda* promote a natural way of living. Further it is stated, in mandala 10 as below.

आन्त्रेभ्यस्ते गुदाभ्योवनिष्ठोहृदयादधि । यक्ष्मं मतस्त्राभ्यांयक्रःप्लाशिभ्योविवृहामिते । ऋग्वेद १०- १६३- ३

*Āntrebhyaste gudābhyovaniṣṭhohṛdayādadhī | Yakṣmān
matasnābhyāmyaknaḥplāśibhyovivṛhāmitē | R̥gveda 10- 163- 3*

As per above in *sūkta* 3-163 of *maṇḍala 10*, it is said that “Oh patient ‘I’ remove all the diseases from ‘your’ organs of excretion, the large bowel, heart, small bowel, both kidneys, liver and from other viscera” (Gautam, 2014).

यदाशसानिःशसाभिःशसोपारिमजाग्रतोयत्स्पपन्तः । अग्निर्विश्वान्युपदुष्कृतान्यजुष्यान्यारे अस्मद्घातु । ऋग्वेद -१० -१६-३

*Yadāśāsāniḥśasābhiḥśasopārimajāgratoyatṣpapantaḥ | Agnirviśvānyupaduṣkṛtānyajūṣyānyāre
asmaddadhātu | R̥gveda 10- 164- 3*

It is a prayer to *Agni* to remove all bad deeds committed while awake and sleep (means consciously and unconsciously). Also this prayer to *Agni* is for removal of all disturbances of mind

such as hope, ambition, and sadness. Also it is a prayer to *Agni* to remove the thoughts (haphazard and uncontrolled) and make the mind still and tranquil.

The cause of obesity is linked with flow of thoughts and resultant deeds (leading to eating disorder, lack of exercise and lack of relaxation).

Further *Śvetāśvetara Upaniṣad* (Lokeswarananda, 2005), clearly specify the symptoms of a successful yogi as below.

लघुत्वमारोग्यमलोलुपत्वम् वर्णप्रसादं स्वरसौष्टवं च । गन्धः शुभो मूत्रपुरीषमल्पं योगप्रवृत्तिं प्रथमं वदन्ति ॥ श्वेता उप - २-१३

Laghutvamārogyamalolupatvam Varṇaprasādaṁ svarasauṣṭavaṁ ca | Gandhaḥ śubho mūtrapurīṣamalpaṁ Yogapravṛttim prathamam vadanti || Śvetāśvetara Upaniṣad - 2-13

The first sign of success in yoga is that *yogi* will have *lagutvam* or lightness of the body. Further it is said that *yogi* will have *ārogyam* or positive health, bright complexion, sweet voice, good smell in the body (*Śubha Gandhaḥ*). These symptoms indicate that the treatment of obesity was considered in yoga therapy.

It is also relevant to note that the lightness of the body is specially emphasized in addition to mentioning the positive health. This is one of the early references on the relationship between yoga and obesity.

The symptoms of obesity such as perspiration and bad smell from body due to fat, fatigue, and craving for enjoyment (including taking excessive food) are indirectly indicated in the above lines.

पृथिव्यप्तेजोऽनिलखे समुत्थिते पञ्चात्मके योगगुणे प्रवृत्ते । न तस्य रोगो न जरा न मृत्युः प्राप्तस्य योगाग्निमयं शरीरम् ॥
श्वेता - उप २- १२

Pr̥thivyap̥tejo'nilakhe samutthite pañcātmake yogaguṇe pravṛtte | Na tasya rogo na jarā na mṛtyuḥ prāptasya yogāgnimayaṁ śarīram || Śvetāśvetara Upaniṣad - 2- 12

The symptom of old age wrinkles etc., will be removed by yoga. This is also relevant reference because the biological age is increased by obesity. Hence the symptoms of the old age will be more visible in obese and these can be reversed by yoga practices.

Thus, once the body is transformed, the yogi is no more susceptible to disease old age or death. Further it is said that, in following lines, that the luminous cosmic consciousness is pervading everywhere and the knowledge is the remedy for sufferings. Also it is stated as below.

यो देवो अग्नौ योऽप्सु यो विश्वं भुवनमाविवेश । यो ओषधीषु यो वनस्पतिषु तस्मै देवाय नमो नमः ॥ श्वेता - उप २-१७
Yo deavo agnau yo'psu yo viśvaṁ bhuvanamāviveśa | Yo oṣadhīṣu yo vanaspatiṣu tasmai devāya namo namaḥ || Śvetāśvetara Upaniṣad 2-17

It is stated that the lump of gold coated with dirt retained its natural glitter when cleaned by fire and water. It may be noted that the excessive fat is like dirt and by cleaning or purification the human body regains its natural form. If the person realizes himself as universal soul (*Brhman*) he goes beyond all sorrows (Lokeswarananda, 2005).

2.52 Food is nothing but oblation as per *Upaniṣad*

As per the *Upaniṣad*, food should not be eaten just out of passion, but eating is a sacrifice. Food is called as medicine for life. It is the conscious divine being within, the real eater of the food, for whom food is offered as oblation.

2.53 Obesity and ancient texts of mind body systems such as Ayurveda

In Ayurveda *Sthaulyā* or obesity is described in detail. The *Sthaulyā* is derived from the root *Sthu*, the suffix which stands for thick, solid, big or bulky (Gopalani & Sarmandal, 2013).

The word obesity is derived from the Latin word *obesus*. *Ob* means due to, *edo* means eat, which means having eaten.

Sthaulya is having heaving and bulkiness of the body due to overgrowth, especially in abdomen region. The state *Sthula* is called *Sthaulya*.

The Sthula has been defined as “who on account of the excessive increase of fat and flush is disfigured with pendulous buttocks, belly and breast and whose increase in bulk is not matched by corresponding increase in energy (Gopalani & Sarmandal, 2013).

इह खलु शरीरमधिकृत्य अष्टौ पुरुषाः निन्दिताः भवन्ति । तद्यथा अतिदीर्घश्च अतिह्रस्वश्च अतिलोमा च अलोमा च अतिकृष्णश्च अतिगौरश्च अतिस्थूलश्च अतिकृशश्चेति ॥च। सं १-१२-३

Iha khalu śarīramadhikṛtya aṣṭau puruṣāḥ ninditāḥ bhavanti | Tadyathā atidīrghaśca atihrasvaśca atilomā ca alomā ca atikṛṣṇaśca atigauraśca atisthūlaśca atikṛśaśceti | Caraka Saṁhita 1-12-3

2.54 Classification (Gopalani & Sarmandal, 2013)

Obesity is classified as below by various texts of Ayurveda:

Sage *Caraka* : *Sthūla, Atisthūla*

Sage *Suśruta* : *Stoulya, Medodara*

Sage *Vāgbhaṭa* : *Adhika, Madya, Hīna*

Stoulya is one among *kapha* predominant disease involving *kapha* and *meda* as main *doṣa* and *dūṣya* in the pathogenesis. Sage *Caraka* mentioned that *Stoulya* and *Prameha* have direct relation because both have *kledaka kapha* and *meda* dominance in their pathogenesis. Sages said that *Stoulya* is *bahudoṣaja* disease that is root cause of many other diseases. It is one of the *Vyapya* (difficult to treat) diseases (Gopalani & Sarmandal, 2013).

The ancient Ayurveda texts recognize obesity as an illness. In the *Caraka Saṁhita* chapter 21 *sloka* 3, eight types of undesirable personalities are described and one of them is overweight / obesity (Sharma & Dash, 2015). It is described that obese will have less longevity, slowness in

movement, weakness, emitting bad smell of body due to sweating, sexual weakness, more hunger and thirst. These are the distinct characteristics given by *Caraka Samhita* for obesity (Sharma & Dash, 2015).

As per *Caraka Samhita* (Sharma & Dash, 2015) obesity is caused by excess intake of food especially heavy, sweet and cooling food. Also it is mentioned that obesity is caused by the lack of physical and mental exercise. Further it is caused by day sleep, uninterrupted cheerfulness and heredity. For obese people, *dhātu* of fat only grows. Due to the heaviness and looseness of the fat, movement is restricted. Hence equilibrium of *dhātu* is disturbed. Bad smell is caused because of defect in the fat tissue. Fat is associated with *Kapha*, one of the humors (*Tridoṣa* or humors are *Vāta Pita Kapha*, the fundamental energies which determine the physical and mental state of each person. Everyone will have unique equilibrium of the *Tridoṣa*) (Gopalani & Sarmandal, 2013).

According to Ayurveda, the *Agni* is responsible for all digestive and metabolic activities and the levels of *Mandāgni Jaṭharāgni and Dhātvaṅni* are considered as the root cause of all diseases. The disorders like *Stoulya* or obesity is caused by derangement of *Dhātvaṅni*. In *Stoulya*, due to vitiation of *vāta* by obstruction of *meda*, the *tikṣṇāgni* also occurs which will prompt the person to eat again and again. This will make further disturbance in *Agni* and and cause the formation of *āma* or unmetabolised waste. Due to repeated overeating, the *Medogni* is diminished leading to excessive accumulation of *Meda or fat* in the *Āma* form (Gopalani & Sarmandal, 2013). Due to heaviness obese cannot withstand physical exercise. Because of digestive power, and excessive *Vayu or wind*, obese will have excessive hunger and thirst. The *Caraka Samhita* further explains the patho-physiology of obesity

(in *śloka* 5 and 6 of chapters 21) that due to obstruction in the passage of fat, the movement of *vāta* is restricted to *Koṣṭha* (i.e. abdominal viscera). Thus obese digests food quickly and become a frequent eater. The *Agni (Pitta)* and *Vāta* are two factors which burn obese people like the fire burns the forest. Due increase in fat in buttock, abdomen, breast, the strength of obese is not proportionate with the physical growth.

Further etiology symptoms and defects of obese are explained in *Caraka Samhita*. When obese person gets a disease, suffering is much more than that of a corpulent person. Underweight is less harmful than obesity as per sage *Caraka*.

Further as per *Yoga Ratnākara*, another ancient *Ayurveda* text, short repeated breathing, thirst, sleepiness, hunger, sweating, foul odour of body, fatigue, less sexual power are prominent features of obesity (Kumari & Tiwari, 2010).

Generally the fat is accumulated in abdomen and bones and the belly of obese are enlarged. The channels of *Vayu* are blocked and fat is accumulated. The obese person's belly is enlarged because of fat in abdomen as per *Yoga Ratnākara* text (Kumari & Tiwari, 2010). The channels being blocked by *meda*, *vāta* become active especially in abdomen and accelerate digestive process. For the prognosis *Yoga Ratnākara* says that if fat is increased *Vāta* and other *Doṣa* may cause diseases and may lead to early death (Kumari & Tiwari, 2010).

2.55 The classification of food relevant to Obesity

Yoga considers the effect of food on the mind. The types of food are *Satvā Rajas* and *Tamas*. The *Bhagavat Gīta* (BG) which is the cream of all scriptures, has very deep meanings and the verses can be interpreted in the terms of nutrition metabolism and endocrinology which are relevant to obesity

(Kalra & Jindal, 2014; Nagaratna & Nagendra, 2014). As per *Bhagavat Gīta* Satvā food is described as below,

आयुःसत्त्वबलारोग्यसुखप्रीतिविवर्धनाः ।

रस्याः स्निग्धाः स्थिरा हृद्या आहाराः सात्त्विकप्रियाः ॥ भ ।गी १७-८ ॥

Āyuhṣattvabalārogyasukhaprītivivardhanāḥ ।

Rasyāḥ snigdḥāḥ sthirā hr̥dyā āhārāḥ sāttvikapriyāḥ ॥ Bhagavat Gīta 17-8 ॥

कट्वम्ललवणात्युष्णतीक्ष्णरूक्षविदाहिनः ।

आहारा राजसस्येष्टा दुःखशोकामयप्रदाः ॥ भ ।गी १७-९ ॥

Kaṭvamlalavaṇātyuṣṇatīkṣṇarūkṣavidāhinaḥ ।

Āhārā rājasasyeṣṭā duḥkhaśokāmayapradāḥ ॥ Bhagavat Gīta 17-9 ॥

The food items are classified into three as *Sātvika Rājasika and Tāmasika*. The *Sātvika* food is the one which makes person happy, strong and healthy. Generally satvā food is simple vegetarian diet with sufficient nutrients and minimum spice and fat.

2.56 Concept of moderation in food

Concept of moderation in quantity and quality of food is to be followed as per the *Bhagavat Gīta*. The food which increases life, purity, stamina and health, cheerfulness and good appetite are *Sātvika*. The *Rājasika* food is those which excite the mind and increase stress level. All stimulating foods are *Rājasika* as per *Bhagavat Gīta*. This stimulates nervous system and increase the metabolism. All junk foods come under the classification of *Tāmasika* food. These foods are stale tasteless, stinking, cooked overnight and impure as per *Bhagavat Gīta*. *Tāmasik* foods make one lazy heavy and unable to think.

As per *Bhagavat Gīta*, person who has moderation in food, exercise, entertainment, sleep and wakefulness will be healthy. Thus *Bhagavat Gīta* gives very subtle information for the prevention of diseases and sorrow (Yogacharya Sundaram, 2004).

Hence one should have proper food, activity, sleep, and wakefulness. That is the *Āhāra* (food) *Vihāra* (activity) and *Viśrānti* (relaxation) i.e. Proper food, proper physical activity and proper relaxation are to be followed. All these three components of life affect obesity. In *Bhagavat Gīta* it is stated that,

युक्ताहारविहारस्य युक्तचेष्टस्य कर्मसु ।
युक्तस्वप्नावबोधस्य योगो भवति दुःखहा ॥ भ ।गी ६-१७ ॥
Yuktāhāravihārasya Yuktaceṣṭasya karmasu ।
Yuktasvapnāvabodhasya Yogo bhavati duḥkhahā ॥ Bhagavat Gīta 6-17॥

Hence the proper diet, proper physical activities, and proper relaxation are needed for getting rid of the sufferings.

In *Bhagavat Gīta* it is stated that, समत्वं योग उच्यते *Samatvaṁ yoga ucyate* means that yoga is balance in every action which includes eating. It is noted that the unbalance in energy intake and energy expenditure due to eating disorders and inactivity is one of the causes of suffering.

2.57 Bhartruhari

As per texts of *Bhartruhari* hunger, sleep, fear, procreation are common to man and animals (Nagaratna & Nagendra, 2014). The *Buddhi* is special to man. Person who does not have *Buddhi* is similar to animal. Here *Bhartruhari* says the importance of *Vijñānamaya Kośa* over *Manomaya kośa* to have mastery over instincts and feelings. *Vijñānamaya Kośa* is the discriminating layer in the human consciousness. Thus food control and the moderation in all activities are very much required for prevention of diseases.

2.58 Concept of disease as per Yoga Vasiṣṭha

The *Yoga vasiṣṭha*, (YV) is an ancient yoga text with about 32,000 verses written in the form of question and answers. Sage *Vasiṣṭha* classify the diseases as, those born from mind or *Ādhija* and those born from external (from environment, animal bite etc.) or *Anadhija*. The *Ādhija* disease is again divided into two namely essential (suffering of birth cycles etc.) or *Sāra* and general or *Sāmānya*. In the *Sāmānya* the root cause of disease is agitated mind and stress.

Obesity comes under *Sāmānya* category of disease and Sage *Vasiṣṭha* prescribed control of mind as only solution. The control of mind includes control over the sense organs including control on eating. The stillness of mind is prerequisite to reduce obesity since disorder starts from mind. The yoga is the method for making the mind calm.

मनः प्रशमनोपायः योग इत्यभिधीयते । यो । वा ३-९-३२

Manah praśamanopāyaḥ Yoga ityabhidhīyate | Yoga Vasiṣṭha 3-9-32

The yoga is the method to keep the mind still. Thus *Yoga Vasiṣṭha* emphasizes the importance of keeping the mind cool and balanced (Atreya BL, 2005).

Further, as per *Yoga Vasiṣṭha*, the world is the unfolding of mind. The creation and dissolution of world is nothing but the opening and closing of the mind.

चित्तमेव जगत्कर्तृ सङ्कल्पयति यद्यथा । असत्सत्सदसच्चैव तत्तथा तस्य तिष्ठति ॥यो । वा २-६ ६१-११४-१७

Cittameva jagatkarṭṛ Saṅkalpayati yadyathā | Asatsatsadasaccaiva Tattathā tasya tiṣṭhati || Yo | vā 2-6 (61-114-17)

Yoga Vasiṣṭha categorically reiterate that the mind alone is the maker of world which can be real unreal none or both. As per *Yoga Vasiṣṭha*, like leaves creepers flowers fruits etc., present in a

sprout, there are fields of waking dreaming and roaming attitudes of the mind. In nutshell, mind is the root cause for all problems and disorders.

Further *Yoga Vasiṣṭha* says that, dissatisfaction and discontentment are cause of disease. Excessive desire, unhealthy food, improper locality, works at wrong times, bad deeds, company of bad people, thinking bad about others are some of the reasons of developing diseases. Thus disease is arising from 'our' foolish desires.

2.59 Classical yoga texts and concepts of obesity

The fundamental texts of yoga such as *Patanjali Yoga Sutra (PYS)* *Haṭhayogapradīpika (HP)* are dealing many aspects of obesity in direct and indirect terms. Many times the truth is presented in a poetic manner with metaphors and the hidden hints and pointers.

2.60a The *Patanjali yoga sutra (PYS)* and obesity

As per PYS Yoga is the suppression of the modification of thought waves.

योगश्चित्तवृत्तिनिरोधः ॥ प । यो । सू १-२ ॥

Yogaścittavṛttinirodhaḥ || *Patanjali yoga sutra* 1-2 ||

Yoga is the suppression of the modification of thought waves (Taimini, 2010). Mind has the three qualities of *Triguna* the *Satva Rajas* and *Tamas*. Mind is influenced by external objects. When mind is dominated by *Tamas*, it will act in false knowledge. By discrimination (*Viveka Khyāti*) one overcomes the false knowledge. Thus mastery of mind is very important.

As per *Patanjali*, disease is the first obstacle in the path of *yoga sadhana* (Taimini, 2010). Though the obesity or *Meda* word is not directly mentioned in the text, from the symptoms of sufferings and the super natural powers expected by the practice of yoga, one can interpret and understand the relevance and aspects of obesity disease, embedded and hidden in many aphorisms in *Patanjali yoga sutra*.

Patanjali yoga sutra described disease or *Heya*- suffering, *Hetu*- the cause of suffering, *Hāna*- relief from suffering and *Hanopāya*- methodology for treatment for suffering. Control over modification of *Citta* is required. All diseases are from wrong identification of ‘*Self*’ due to Ignorance or *Avidya*. *Patanjali Yoga Sutra* indicates the achievement of super natural power in Chapter three.

It is stated that one gains control over thirst and hunger by doing *Samyama* on the throat.

व्याधिस्त्यानसंशयप्रमादालस्याविरतिभ्रान्तिदर्शनालब्धभूमिकत्वानवस्थितत्वानि चित्तविक्षेपास्तेऽन्तरायाः ॥५॥ यो । सू
१-३० ॥

*Vyādhistyānasamśayapramādālasyaaviratibhrāntidarśanālabdhabhūmikatvānavasthitatvāni
cittavikṣepāste’ntarāyāḥ ॥ Patanjali yoga sutra 1-30 ॥*

The nine obstacles which cause the distraction of mind are emphasized. The first obstacle mentioned is illness. These obstacles are relevant in the effort to reduce obesity. While practicing yoga, incompetence, doubt, erroneous conceptions, instability, non- attainment of desired state etc, are visible obstacles. Specific mention is made on qualities such as sloth which is disinclination arising out of heaviness of the body and mind, as per the interpretation given by Swami Hariharananda Aranya (Hariharananda Aranya, 2000).

अविद्यास्मितारागद्वेषाभिनिवेशाः क्लेशाः ॥ ५ ॥ यो । सू २-३ ॥

Avidyāsmītārāgadveṣābhinivēśāḥ kleśāḥ ॥ Patanjali yoga sutra 2-3 ॥

As per *Patanjali Yoga Sutra* all sufferings are due to ignorance (*Avidya*). There are five afflictions, which are ignorance, ‘*I-am-ness*’, attraction, aversion and fear of death. Ignorance is the field of production of other four sufferings and the discriminative mind has the capacity to remove the *Kleśa* which are in different forms.

अविद्या क्षेत्रमुत्तरेषां प्रसुप्ततनुविच्छिन्नोदाराणाम् ॥ ५ ॥ यो । सू २-४ ॥

Avidyā kṣetramuttareṣāṁ prasuptatanu vicchinodārāṇām || Patanjali yoga sutra Sū 2-4||

The nescience is the primary cause and it may be in various forms. It may be dormant, attenuated, or inactive state.

In the third chapter of *Patanjali yoga sutra*, while describing the supernatural powers by performing *Samyama* at naval center, it is stated that the knowledge of the arrangement of internal organs of the physical body can be obtained. Sage Patanjali considered the difficulties of obesity such as frequent hunger and thirst and describe the methods to control sufferings, in the immediate next aphorism. It is stated that by doing *Samyama* on throat well (trachea) hunger and thirst disappears.

कण्ठकूपे क्षुत्पिपासानिवृत्तिः ॥ प । यो । सू ३-३० ॥

Kaṅṭhakūpe kṣutpipāsānivr̥t̥tiḥ || Patanjali yoga sutra 3-30||

कूर्मनाड्यां स्थैर्यम् ॥ ३१ ॥प । यो । सू ३-३१

Kūrmanāḍyāṁ sthairyam || Patanjali yoga sutra 3-31||

Cessation of hunger and thirst is important for control of obesity because eating disorder is one of the causes leading to fat accumulation. Sage Patanjali in the next aphorism systematically put forth another symptom of obesity, which is instability.

By performing *Samyama* on the tortoise shaped *Kurma Nāḍi* or channel below the throat, (bronchial tube) the steadiness of the body is achieved.

It can be interpreted that the *Viśuddhi Cakra* and the thyroid endocrine glands located at the throat well, have direct influence on metabolism and fat disposition. The *Viśuddhi Cakra* which will give the cooling effect is essential for the calmness of the body and mind and balancing of

parasympathetic nervous system. As per the modern science function of thyroid has importance in regulation of fat metabolism.

In the ancient times by seeing the *pranic* body different illness were diagnosed. There is a difference in opinion about the exact location of the *Kurma Nāḍī*. Vyasa and Vachaspathi interpreted that *Kurma Nāḍī* is within the chest.

समानजयाज्ज्वलनम् ॥ प । यो । सू ३-४० ॥

Samānajayāj्ज्वलनम् ॥ Patanjali yoga sutra 3-40 ॥

By doing *Samyama* on *Samāna Prāṇa* gastric fire and capacity for digestion is enhanced. This aphorism is also a pointer towards regulation of fat metabolism.

Further it is said that the perfection of body is obtained by mastery over the five elements.

रूपलावण्यबलवज्रसंहननत्वानि कायसम्पत् ॥ प । यो । सू ३-४६ ॥

Rūpalāvanyabalavajrasaṁhanantvāni kāyasampat ॥ Patanjali yoga sutra 3-46 ॥

Above *Sūtra* says that perfection of body will be obtained by mastery over *Bhuta*. The quality of the body depends on the action of *Bhuta* or five elements. The person who is master of the five elements can regulate the processes taking place in the body. When defects caused by accumulated *Karma* are removed the body regains naturally to the beauty. The imperfections in the physical body are due to disharmony and obstructions. These are removed by attaining perfections, and body is the grossest of (Taimini, 2010) the vehicles in philosophical terms.

2.60b Obesity and Haṭha Yoga Texts with special reference to Haṭhayogapradīpikā

The *Haṭha Yoga* texts, like *Haṭhayogapradīpikā (HP)*, *Gheraṇḍa Saṁhita Śiva Saṁhita*, *Haṭha Ratnāvali*, *Yoga Taraṅgiṇi*, *Vaśiṣṭh Saṁhita*, recognize obesity as a disease and prescribe practices

for reducing the difficulties. Even though therapy is not the primary objective, the symptoms described clearly indicate that obesity is well recognized and addressed in these texts.

The *Haṭhayogapradīpikā* is one of the classical yoga texts dealing with the various yoga practices (Muktibodhananda, 2005; Svatmarama, 2005). The text contains four chapters namely *Āsana Prāṇāyāma Mudra & Bandha* and *Samādhi* with total about 390 *Śloka* (each one of 4 lines).

The *Haṭhayogapradīpika* contains numerous references directly and indirectly on physical body, overweight, control of obesity, fat metabolism, eating thirst hunger gastric fire sleep lethargy laziness beauty leanness, enlargement of body organs , power of body size reduction etc. are some of them.

Many of the *śloka* are embedded with hidden meanings metaphors and poetic pointers. The lines are to be interpreted with reference to sufferings of obesity. For example, it is stated that over eating will destroy the yoga practitioner, which is relevant to obesity.

First chapter of *Haṭhayogapradīpika* is on *Āsana* and it is said that by doing *Āsana* one will get stability health and lightness of the body. Further in Chapter two of the *Haṭhayogapradīpika*, states that after performing yoga the vessel carrying the life energy, *Naḍi* will become pure and body will become lean and bright. The indication of success of *Haṭhayoga* is lightness of body, clearness of face and improved digestion among others.

The *Haṭhayogapradīpika* text (Muktibodhananda, 2005; Svatmarama, 2005) was searched and found that more than fifteen percentage of the total text is having the some relevance on obesity sufferings (60 out of about 390 *śloka*). These references are found in all the four chapters.

2.61 Detailed references in *Haṭhayogapradīpikā* (Muktibodhananda, 2005; Svatmarama, 2005)

Following are some of the important references given in *Haṭhayogapradīpikā*.

हठस्य प्रथमाङ्गत्वादासनं पूर्वमुच्यते ।

कुर्यात्तदासनं स्थैर्यमारोग्यं चाङ्ग-लाघवम् ॥ हठ ।यो ।प्र १-१९ ॥

Haṭhasya prathamāṅgatvādĀsanam pūrvamucyate ।

Kuryāttadāsanam sthairyamĀrogyam cāṅga-lāghavam ॥ Haṭhayogapradīpikā 1-19 ॥

The first step of *Haṭha* is *Āsana* or body posture and by doing *Āsana*, practitioner gets stability, health, and lightness of body. Here sage Swatmarama emphasized lightness of body, in addition to the health, which is very relevant to obesity. The lightness includes flexibility of joints and fat dissipation. This is the first *śloka* of the first chapter and the importance of *Haṭha* for obesity is emphasized.

मत्स्येन्द्र-पीठं जठर-प्रदीप्तिं प्रचण्ड-रुग्मण्डल-खण्डनास्त्रम् ।

अभ्यासतः कुण्डलिनी-प्रबोधं चन्द्र-स्थिरत्वं च ददाति पुंसाम् ॥ हठ ।यो ।प्र १-२९ ॥

Matsyendra-pīṭham jaṭhara-pradīptiṁ Praçaṇḍa-rugmaṇḍala-khaṇḍanāstram ।

Abhyāsataḥ kuṇḍalinī-prabodham Candra-sthiratvaṁ ca dadāti puṁsām ॥ Haṭhayogapradīpikā 1-29 ॥

While describing *Matsendrasana*, *Haṭhayogapradīpika* says that it stimulates the appetite and it is a weapon for destroying many diseases. Hunger and satiety disorders are present in obesity. And this *Śloka* is a pointer towards regulation of eating disorder.

इति पश्चिमतानमासनाग्र्यं

पवनं पश्चिम-वाहिनं करोति ।

उदयं जठरानलस्य कुर्याद्

उदरे काश्यमरोगतां च पुंसाम् ॥ हठ ।यो ।प्र १-३१ ॥

Iti paścimatānamāsanāgryam

Pavanam paścima-vāhinam karoti ।

Udayam jaṭharānalasya kuryād

Udare kārśyamārogatāṁ ca puṁsām || Haṭhayogapradīpikā 1-31 ||

Haṭhayogapradīpika says that the *Paścimatānāsana* is first among the *Āsana* which improve the fire of stomach, flatten the belly, and restore positive health. Flattening the belly is one of the direct references about obesity in *Haṭhayogapradīpika*.

हरति सकल-रोगानाशु गुल्मोदरादीन

अभिभवति च दोषानासनं श्री-मयूरम् ।

बहु कदशन-भुक्तं भस्म कुर्यादशेषं

जनयति जठराग्निं जारयेत्काल-कूटम् ॥ हठ ।यो ।प्र १-३३ ॥

Harati sakala-rogānāśu gulmodarādīn

Abhibhavati ca doṣānāsanam śrī-mayūram |

Bahu kadaśana-bhuktaṁ bhasma kuryādaśeṣam

Janayati jaṭharāgnim jārayetkāla-kūṭam || Haṭhayogapradīpikā 1-33 ||

Haṭhayogapradīpika says that *Mayūrāsana* destroys all diseases such as enlargement of abdomen and spleen. It stimulates gastric fire digests even poison. This *Śloka* has special reference on physical state of obesity and eating disorder. The junk food can be considered as a poison in food and it is stated that *Mayūrāsana* will digest all poison.

इदं पद्मासनं प्रोक्तं सर्व-व्याधि-विनाशनम् ।

दुर्लभं येन केनापि धीमता लभ्यते भुवि ॥ हठ ।यो ।प्र १-४९ ॥

Idam padmāsanam proktaṁ Sarva-vyādhi-vināśanam |

Durlabham yena kenāpi Dhīmatā labhyate bhuvi || Haṭhayogapradīpikā 1-49 ||

Haṭhayogapradīpika says that *padmāsana* is the destroyer of all diseases and only wise on the earth will be able to attain it.

पार्श्व-पादौ च पाणिभ्यां दृढं बद्ध्वा सुनिश्चलम् ।

भद्रासनं भवेदेतत्सर्व-व्याधि-विनाशनम् ।

गोरक्षासनमित्याहुरिदं वै सिद्ध-योगिनः ॥ हठ ।यो ।प्र १-५६ ॥

Pārśva-pādaṁ ca pāṇibhyāṁ Dr̥ḍham baddhvā suniśalam ।

Bhadrāsanaṁ bhavedetatSarva-vyādhi-vināśanam ।

GoraḥśāsanamityāhuRidaṁ vai siddha-yoginaḥ ॥ Haṭhayogapradīpikā 1-56 ॥

Haṭhayogapradīpika says that the *Bhadrāsana* removes all diseases and this is also called

Goraḥśāna.

This *Āsana* is particularly relevant to removal of fat on the legs.

सुस्निग्ध-मधुराहारश्चतुर्थांश-विवर्जितः ।

भुज्यते शिव-सम्प्रीत्यै मिताहारः स उच्यते ॥ हठ ।यो ।प्र १-६० ॥

Susniḡdha-madhurāhāraścaturthāṁśa-vivarjitaḥ ।

Bhujyate śiva-samprītyai Mitāhāraḥ sa ucyate ॥ Haṭhayogapradīpikā 1-60 ॥

According to *Haṭhayogapradīpika* moderate diet, is sweet nutritious and satisfying food taken for the pleasure of Lord *Śiva* and one has to leave one quarter of the stomach as empty. This *Śloka* gives important aspects of eating. The food should be taken with a pleasant mental condition and in a satisfying manner. The food taken hurriedly is indigestible and harmful. The prayer to *Śiva* indicates the required mental attitude during eating. Further there should not be any over eating, and to avoid that one-quarter of the stomach is to be kept vacant. These guidelines of *Haṭhayogapradīpika* on eating will positively affect the health of obese people.

पुष्टं सुमधुरं स्निग्धं गन्धं धातु-प्रपोषणम् ।

मनोभिलाषितं योग्यं योगी भोजनमाचरेत् ॥ हठ ।यो ।प्र १-६६ ॥

Puṣṭaṁ sumadhuraṁ sniḡdhaṁ gavyaṁ dhātu-prapoṣaṇam ।

Manobhilaṣitaṁ योग्याṁ योगी bhōjanamācāret ॥ Haṭhayogapradīpikā 1-66 ॥

As per *Haṭhayogapradīpika*, the recommended food shall be desirable, suitable, nutritious, juicy, and which strengthens the body elements.

युवो वृद्धोऽतिवृद्धो वा व्याधितो दुर्बलोऽपि वा ।

अभ्यासात्सिद्धिमाप्नोति सर्व-योगेष्वतन्द्रितः ॥ हठ ।यो ।प्र १-६७ ॥

Yuvo vṛddho' tivṛddho Vā vyādhito durbalo'pi vā |

Abhyāsātsiddhimāpnoti Sarva-yogeṣvatandritaḥ || Haṭhayogapradīpikā 1-67 ||

Haṭhayogapradīpika says that by regular practice of yoga, irrespective of age, disease and weakness, one gets success.

अथासने दृढे योगी वशी हित-मिताशनः ।

गुरुपदिष्ट-मार्गेण प्राणायामान्समभ्यसेत् ॥ हठ ।यो ।प्र २-१ ॥

Athāsane dṛḍhe yogī Vaśī hita-mitāśanaḥ |

Gurūpaḍiṣṭa-mārgēṇa Prāṇāyāmānsamabhyaset || Haṭhayogapradīpikā 2-1 ||

Further, *Haṭhayogapradīpika* says after mastering asana and by eating moderate food one should practice pranayama. Here the moderate diet is emphasized which is very relevant to obesity.

यदा तु नाडी-शुद्धिः स्यात्तथा चिह्नानि बाह्यतः ।

कायस्य कृशता कान्तिस्तदा जायेत निश्चितम् ॥ हठ ।यो ।प्र २-१९ ॥

Yadā tu nāḍī-śuddhiḥ Syāttathā cihnāni bāhyataḥ |

Kāyasya kṛśatā kāntiḥstadā jāyate niścitam || Haṭhayogapradīpikā 2-19 ||

In the above verses, it is said that the external signs of success will be evident, when the *nadis* or vessels carrying life force, become purified. The first and foremost sign of the purification of the *nadi* is the *Kāyasya Kṛśatā* or the leanness of the physical body. This is a very emphatic statement on the result of *Praṇāyāma* by sage Swatmarama, which is very relevant to obesity.

.मेद-श्लेष्माधिकः पूर्वं षट्-कर्माणि समाचरेत् ।

अन्यस्तु नाचरेत्तानि दोषाणां समभावतः ॥ हठ ।यो ।प्र २-२१ ॥

*Meda-śleṣmādhikāḥ pūroaṁ Ṣaṭ-karmāṇi samācaret |
anyastu nācarettāni Doṣāṇāṁ samabhāvataḥ || Haṭhayogapradīpikā 2-21 ||*

As per *Haṭhayogapradīpika*, one should do the *Ṣaḍkarma* first, before starting other yoga practices, if having *meda* or too much fat. If the *tridoṣa* or humors are balanced (unlike in obesity), then one need not perform the *Ṣaḍkarma*.

The *Ṣaḍkarma* will give quick positive results for obesity.

कास-श्वास-प्लीह-कुष्ठं कफरोगाश्च विंशतिः ।

धौति-कर्म-प्रभावेण प्रयान्त्येव न संशयः ॥ हठ ।यो ।प्र २-२५ ॥

*Kāsa-śvāsa-plīha-kuṣṭham Kapharogāśca viṁśatiḥ |
dhauti-karma-prabhāveṇa Prayāntyeva na saṁśayaḥ || Haṭhayogapradīpikā 2-25 ||*

In the above verse it is said that the *Dhaūti Kriya* is useful for more than twenty phlegm diseases including enlargement of spleen coughing and asthma. It may be noted that the obesity is also *Kapha Doṣa* or phlegm disease, and the *Dhaūti* is very effective for obesity management.

गुल्म-प्लीहोदरं चापि वात-पित्त-कफोद्भवाः ।

बस्ति-कर्म-प्रभावेण क्षीयन्ते सकलामयाः ॥ हठ ।यो ।प्र २-२७ ॥

*Gulma-plīhodarāṁ cāpi Vāta-pitta-kaphodbhavāḥ |
Basti-karma-prabhāveṇa Kṣīyante sakalāmayāḥ || Haṭhayogapradīpikā 2-27 ||*

Similar to *Dhaūti*, the *Basti Kriya* is also useful for obesity. *Haṭhayogapradīpika* says that it is useful for treatment for enlargement of glands, spleen and abdomen, and diseases arising from wind bile and phlegm.

धान्त्वद्रियान्तः-करण-प्रसादं

दधाच्च कान्तिं दहन-प्रदीप्तम् ।

अशेष-दोषोपचयं निहन्याद्

अभ्यस्यमानं जल-बस्ति-कर्म ॥ हठ ।यो ।प्र २-२८ ॥

*Dhāntvadriyāntaḥ-karaṇa-prasādaṁ
Dadhācca kāntiṁ dahana-pradīptam |
Aśeṣa-doṣopacayaṁ nihanyād
Abhyasyamānaṁ jala-basti-karma || Haṭhayogapradīpikā 2-28 ||*

Further *Haṭhayogapradīpika* says the benefits of *Basti Kriya* which are relevant to obesity sufferings. It is stated that if the *Basti* is performed in water, it will purify the body constituents, the sense organs, and mind. Further it is stated that the body will attain *Kānti* or beauty, better digestion and removal of various defects.

*मन्दाग्नि-सन्दीपन-पाचनादि-
सन्धापिकानन्द-करी सदैव ।
अशेष-दोष-मय-शोषणी च
हठ-क्रिया मौलिरियं च नौलिः ॥ हठ ।यो ।प्र २-३४ ॥*

*Mandāgni-sandīpana-pācanādi-
Sandhāpikānanda-karī sadaiva |
Aśeṣa-doṣa-maya-śoṣaṇī ca
Haṭha-kriyā mauliriyam ca nauliḥ || Haṭhayogapradīpikā 2-34 ||*

Regarding *Nauli Kriya*, *Haṭhayogapradīpika* says that this *Kriya* improves the gastric fire and digestion. Also it will give happiness.

*भस्त्रवल्लोह -कारस्य रेच-पूरौ ससम्भ्रमौ ।
कपालभातिर्विल्याता कफ-दोष-विशोषणी ॥ हठ ।यो ।प्र २-३५ ॥*

*Bhastrāvalloha-kārasya Reca-pūrau sasambhramau |
Kapālabhātīrvikhyātā Kapha-doṣa-viśoṣaṇī || Haṭhayogapradīpikā 2-35 ||*

While describing *Kapālabhāti Kriya*, *Haṭhayogapradīpika* says that it will reduce the *Kapha Doṣa* which is one of the causes of obesity.

सीत्कां कुर्यात्तथा वक्त्रे घ्राणेनैव विजृम्भिकाम् ।

एवमभ्यास-योगेन काम-देवो द्वितीयकः ॥ हठ ।यो ।प्र २-५४ ॥

Sītkāṁ kuryāttathā vaktre Ghrāṇenaiva vijrmbhikām ।

Evamabhyāsa-yogena Kāma-devo dvitīyakaḥ ॥ Haṭhayogapradīpikā 2-54 ॥

While describing *Sītkāri Prāṇāyāma*, it is stated that by practicing this, person will become handsome and beautiful only second to the Lord *Kāma-Devo*. *Kāma-Devo* is a heavenly divine entity and is the name of Lord Viṣṇu. The word *Kāma* indicates desire in sensual terms. Also the word *Kāma-Devo* is used for Lord Śiva who is the originator of yoga. *Kāma-Devo* is the most handsome physical body one can imagine (Gopal, 1990). Hence this *Prāṇāyāma* is directly linked to obesity reduction and for making the body most handsome.

योगिनी चक्र-संमान्यः सृष्टि-संहार-कारकः ।

न क्षुधा न तृषा निद्रा नैवालस्यं प्रजायते ॥ हठ ।यो ।प्र २-५५ ॥

Yoginī cakra-sammānyaḥ Sṛṣṭi-saṁhāra-kāraḥ ।

Na kṣudhā na tṛṣā nidrā Nivālasyaṁ prajāyate ॥ Haṭhayogapradīpikā 2-55 ॥

It is stated that by doing this *Prāṇāyāma* hunger thirst sleep and laziness will disappear. All these are direct attributes of obesity and *Haṭhayogapradīpika* indicate that these attributes of obesity will be reduced.

भवेत्सत्त्वं च देहस्य सर्वोपद्रव-वर्जितः ।

अनेन विधिना सत्यं योगीन्द्रो भूमि-मण्डले ॥ हठ ।यो ।प्र २-५६ ॥

Bhavetsattvaṁ ca dehasya Sarvopadrava-varjitaḥ ।

Anena vidhinā satyaṁ Yogīndro bhūmi-maṇḍale ॥ Haṭhayogapradīpikā 2-56 ॥

The *Sītkāri Prāṇāyāma* will make the person very active and vitality will be regained. The sufferings of body or *Dehasya* will be removed by this practice.

Also Śitali gives the coolness to the body and mind.

विधिवत्कुम्भकं कृत्वा रेचयेदिडयानिलम् ।

वात-पित्त-श्लेष्म-हरं शरीरान्नि-विवर्धनम् ॥ हठ ।यो ।प्र २-६५ ॥

Vidhivatkumbhakarṇi kṛtvā Recayedīdayānilam |
Vāta-pitta-śleṣma-haraṇi Śarīrāgni-vivardhanam || Haṭhayogapradīpikā 2-65 ||

While describing the *Bhastrika Prāṇāyāma*, the meditative posture of *Padmāsana* itself is described as destroyer of all sins. It may be noted that the diseases are described as result of sins. Further *Haṭhayogapradīpika* says that *Bhastrika* removes all the disorders of phlegm wind and bile. The digestion will be improved with proper gastric fire and gives pleasure. These qualities are relevant to obesity.

अन्तः प्रवर्तितोदार-मारुतापूरितोदरः ।

पयस्यगाधेऽपि सुखात्प्लवते पद्म-पत्रवत् ॥ हठ ।यो ।प्र २-७० ॥

Antaḥ pravartitodāra-Mārutāpūritodaraḥ |

Payasyagādhe'pi sukhātPlavate padma-patravat || Haṭhayogapradīpikā 2-70 ||

It is stated that by doing the *Plavani Prāṇāyāma* one can increase the buoyancy force and float in water like a weight less leaf. No specific health benefits are mentioned unlike in the other *Prāṇāyāma*, by Sage Swatmarama. Subtle metaphor of floating leaf in calm deep water, indicate the mental and physical lightness, obtainable by performing this *Prāṇāyāma*.

Also all *Prāṇāyāma* purifies the *naḍi* and give positive health.

वपुः कृशत्वं वदने प्रसन्नता

नाद-स्फुटत्वं नयने सुनिर्मले ।

अरोगता बिन्दु-जयोऽग्नि-दीपनं

नाडी-विशुद्धिर्हठ-सिद्धि-लक्षणम् ॥ हठ ।यो ।प्र २-७८ ॥

Vapuḥ kṛśatvaṇi vadane prasannatā

Nāda-sphuṭatvaṇi nayane sunirmale |

Arogatā bindu-jayo'gni-dīpanaṇi

Nāḍī-viśuddhirhaṭha-siddhi-lakṣaṇam || Haṭhayogapradīpikā 2-78 ||

In above verse, *Haṭhayogapradīpikā* clearly gives the very first symptom of success in *Haṭha* yoga as leanness of body. Also mentioned are freshness of face, health, improved digestion and others which are attributes of non-obesity.

एतत्त्रयं महा-गुह्यं जरा-मृत्यु-विनाशनम् ।

वह्नि-वृद्धि-करं चैव ह्यणिमादि-गुण-प्रदम् ॥ हठ ।यो ।प्र ३-३० ॥

Etattrayam mahā-guhyam Jarā-mṛtyu-vināśanam |

Vahni-vṛddhi-karam caiva Hyanimādi-guṇa-pradam || Haṭhayogapradīpikā 3-30 ||

It is stated that the *Maha Mudra Maha Veedha* and *Maha Bandha* will kill the wrinkles, increase the digestion and will give power of *Aṇima*. *Aṇima* is the power to reduce the body size.

न रोगो मरणं तन्द्रा न निद्रा न क्षुधा तृषा ।

न च मूर्च्छा भवेत्तस्य यो मुद्रां वेत्ति खेचरीम् ॥ हठ ।यो ।प्र ३-३९ ॥

Na rogo maraṇam tandrā Na nidrā na kṣudhā tṛṣā |

Na ca mūrccchā bhavettasya Yo mudrām vetti khecarīm || Haṭhayogapradīpikā 3-39 ||

While describing the benefits of *khecari Mudra* *Haṭhayogapradīpikā* says that it will perish all the diseases lethargy and disorders of sleep hunger thirst and fainting. All of these are attributes of obesity.

बध्नाति हि सिराजालमधो-गामि नभो-जलम् ।

ततो जालन्धरो बन्धः कण्ठ-दुःखौघ-नाशनः ॥ हठ ।यो ।प्र ३-७१ ॥

Badhnāti hi sirājālamadho-gāmi nabho-jalam |

Tato jālandharo bandhaḥ Kaṇṭha-duḥkhaugha-nāśanaḥ || Haṭhayogapradīpikā 3-71 ||

It is stated that the *Jalandhara Bandha* destroys the problems and diseases related to throat. The thyroid gland is directly linked in many obesity problems and is located at throat. In *Jalandhara Bandha*, or the throat lock, head is bent forward and chin is pressed against the throat in between the collar bones. This will stimulate the thyroid gland and balance the metabolism (Muktibodhananda, 2005).

तस्य वाक्य-परो भूत्वा मुद्राभ्यासे समाहितः ।

अणिमादि-गुणैः सार्धं लभते काल-वञ्चनम् ॥ हठ ।यो ।प्र ३-१३० ॥

Tasya vākya-paro bhūtvā Mudrābhyāse samāhitaḥ |

Aṇimādi-guṇaiḥ sārddham Labhate kāla-vañcanam || Haṭhayogapradīpikā 3-130 ||

Haṭhayogapradīpika says that by practice of *Mudra* one can get the power or *Siddhi* of *Aṇima*, which is the power to reduce the body size.

चित्तानन्दं तदा जित्वा सहजानन्द-सम्भवः ।

दोष-दुःख-जरा-व्याधि-क्षुधा-निद्रा-विवर्जित् ॥ हठ ।यो ।प्र ४-७५ ॥

Cittānandaṁ tadā jitvā Sahajānanda-sambhavaḥ |

Doṣa-duḥkha-jarā-vyādhi-Kṣudhā-nidrā-vivarjitaḥ || Haṭhayogapradīpikā 4-75 ||

The yoga practitioner gets bliss and will become free of all disorders fault of indigestion, pains old age diseases, hunger and sleep. These are attributes of obesity.

Reference of obesity in other yoga texts:

In *Vasiṣṭha Samhita* Chapter 2 (Philosophico Literary Research department, 2005) , clearly says that purification of *Nāḍi* is to be performed by *Prāṇāyāma*, for three to four years and the body symptoms after the purification are lightness of the body, effulgence, and increased gastric fire. This indicates that obesity can be controlled by *Haṭha Yoga*.

In *Yoga Taraṅgiṇi*, (Brzezinski, 2015) it is written that if *Kheecari Mudra* is done regularly there will not be any suffering of sleep, hunger, thirst and fainting. The yoga *Mudra* practitioner will conquer disease and death which indicate that the signs of obesity will be removed (Brzezinski, 2015) as below.

न रोगो मरणं तस्य न निद्रा न क्षुधा तृषा । न च मूर्चा भवेत् तस्य यो मुद्रां वेत्ति खेचरीम् ॥ यो । तरं १-६५

Na rogo maraṇam tasya Na nidrā na kṣudhā tṛṣā | Na ca mūrcā bhavet tasya Yo mudrāṁ vetti khecarīm || Yo | Taraṅ 1-65

Gheraṇḍa Samhita (Niranjananada, 2012), also gives many points relevant to obesity and body as given below.

षट्कर्मणा शोधनं च आसनेन भवेद्दृढम् । मुद्रया स्थिरता चैव प्रत्याहारेण धीमता ॥ घे । सं १-१०

Ṣaṭkarmaṇā śodhanam ca Āsanena bhaveddṛḍham | Mudrayā sthiratā caiva Pratyāhāreṇa dhīmatā || Ghe | Saṁ 1-10

प्राणायामाल्लाघवञ्च ध्यानात्प्रत्यक्षमात्मनः । समाधिना निर्लिप्तं च मुक्तिरेव न संशयः ॥ घे । सं १-११

Prāṇāyāmāllāghavañca Dhyānātpratyakṣamātmanah | Samādhinā nirliptaṁ ca Muktireva na saṁśayaḥ || Ghe | Saṁ 1-11

It means that by doing *Prāṇāyāmā* one will reduce the weight. It is stated that one becomes handsome (with lightness of body) by doing *Kapālabhāti* (*Sitkrama*).

The *Matsyāsana* give deep stretch to abdominal muscles and help in reducing the obesity also.

Also for many *Āsana* in *Gheraṇḍa Samhita*, says benefits of destruction of diseases. For the cobra pose (*Bhujamgāsana*) the practice increases body heat and destroy illness. These lines have indirect references of weight reduction. It is stated that this posture is *Sarva Roga Vināśakam* or destroyer of all diseases. The position of the cobra posture is highly relevant in obese because of the compression and massage getting in the visceral organs.

The signs of success of *Haṭha* yoga are slimness of the body cheerful face shining eyes, sense of wellness increase in gastric fire purification of *Nāḍi* etc. That means the weight reduction and health will be achieved by doing yoga practices. Further by practice *Kākri Karma*, a purification process, removes diseases of spleen, abdominal disorders, and morbidities and stimulates gastric fire. This indicates that symptoms of obesity can be removed (Srinivasayogi, 2009).

Śiva Samhita also talks about food control applicable to obesity (Maheshananda et al., 2014). It is said that Yoga practitioner should always take food when air is flowing through right nostril (*surya nāḍi*) and sleep when air is flowing through left nostril (*Candra Nāḍi*). Right nostril breathing reduces obesity. In Chapter 3, (Maheshananda et al., 2014) it is stated that *Paścimatānāsana* increases gastric fire and remove the body fatigue.

In the *Haṭha Yoga* text of *Haṭhasaṅketacandrika* of Sundaradeva (Gharote, 2015), many practices which are relevant to reduction of obesity are mentioned. For example, *Utkāṣāsana* increases the gastric fire and improves the health. Similarly yoga text like *Jogapradīpika* (Gharote, 2015) mentions many yoga practices applicable for obesity diseases. In *Goorakṣa Śataka* Sage Gorakshanath says *Āsanena Rajohanti* means, by doing *Āsana* diseases are removed (Vyavahare Ulkanatu, 2007).

As per *Haṭha Tatva Kaumudi* of Sunderadeva, *Rājasika Tāmasika* food are root cause of diseases (Gharote, 2015). This is applicable to especially obesity. Also many ancient yogic texts like *Jogapradīpika* (Gharote, 2015) *Haṭha Saṅkeeta Candrika* (Gharote, 2015) give references of yoga practices which reduces the excess body fat. The *Māricāsana* reduces the body fat (Gharote, 2015). The *Phoyāsana* which is a posture of sitting with legs extended and up from the ground, reduces obesity (Gharote, 2015). The *Surya Āsana* which is by sitting on ground with feet together and heels under anus. This improves the gastric fire and reduces fat (Gharote, 2015). The *Utkāṣāsana* with toes on ground and heels up reduces the fat as given in *Haṭha Saṅkeeta Candrika* (Gharote, 2015).

Mind and obesity- Psycho Neuro Physiology

Hypothalamus is seat of two centers that control hunger and satiety. Hypothalamus is controlled by the cortex (limbic system) which is seat of emotions. During emotional disturbances person loses control over system functioning and results in appetite or no of appetite. Eating disorder is a psychological disorder due to problems in coping up mechanisms. High levels of cortisol will create various issues e.g. abdominal obesity, type 2 diabetes, osteoporosis and cardiovascular disease (Manenschijn et al., 2011).

Thus Psycho Neuro Physiology also shows that mind is an important factor for treatment of obesity which is also the concept of CAM.

2.62 Conclusion

From the above it can be concluded that obesity was considered as unhealthy condition in the ancient India. The scriptures considered the natural way of healing for the diseases.

The obesity is mainly caused by the life style which is away from the nature. The distance from the nature visible in the food habits, sleep, physical activities relaxation recreation etc., and promotes increased fat deposition by disturbing the balance in *Praṇa* flow. The Yoga practices work towards bringing back to original nature.

According to *Taittiriya Upaniṣad*, the human system consists of five consciousness level or *Pancakośa*. The obesity disease starts from the *Manomaya Kośa* due to uncontrolled upsurge of thoughts. It disturbs the *Praṇa* energy and characterized by irregular breathing and unbalance in the *Praṇa* flow distribution. Further in the *Annamaya kośa* level tissues and organs are affected by excessive disposition of fat .The metabolism is disturbed, the mind control is lost, healthy eating habits are disturbed, sleep and relaxation reduced, stress level is increased, resulting into further deposition of fats. Unless *Vijñānamaya kośa* level intervention started the degradation continues. The discriminative power can make a positive change to reduce the disorder. The Yoga practices imbibe the awareness at all consciousness level and help to have discriminative power.

There are traces of yoga in the Indus Saraswathi civilization dating back to 3000 BC. There are seals and fossils remains of Indus Saraswathi valley civilization with yogic figures. Various ancient texts and scriptures mention about different attributes of obesity.

The classical *Haṭha Yoga* texts give detailed information indirectly on obesity. Also many of the philosophical texts give indirect hints and metaphor on obesity. The five afflictions are basically due to nescience (*Avidya*) and it is responsible for all sufferings including the obesity. The life style changes due to the progress of technology are linked to all the afflictions. The afflictions are to be reduced by discriminative knowledge through perfect non attachment (*Para Vairagya*). Due to lack of non-attachment individual will be under the clings of nescience. Yoga is the means to destroy the afflictions and to get liberation.

The *Veda Upaniṣad* Ayurveda texts and classical yoga texts have references on various attributes of obesity. The *Haṭhayogapradīpika* gives about 15 % of the verses with direct relevance

to obesity problems. Further research on indirect references other literature, on obesity problems is required.

The modern faulty urban life style, which is away from nature, causes uncontrolled upsurge of thought waves and cause unbalance in *Manomaya Kośa* level. This gets transferred to the body level and the triangle of *Āhāra Vihāra Viśrānti* gets disturbed. This causes further unbalance in energy intake and energy expenditure and causes fat deposition.

There is a need to expand the treatment options for obesity. Further research on the subject is required especially based on ancient Indian texts of Yoga, Ayurveda and Naturopathy which all are based on treatment on mind (Psycho Neuro Immunology). The integrated approach of treatment incorporating various components has scope for future research.

CHAPTER-3

Review of Scientific Literature

3.0 REVIEW OF SCIENTIFIC LITERATURE

The studies on scientific research literature were carried out and summarised in Table 3 below.

Table- 3: Studies on obesity

SL. No	Author and year of publication	(N)	Experimental Design Variable studied	Findings	Remarks
1	Suchetha, K.N., Damodara, K.M., Sukesh, L. N., Katyayani. (2011). <i>Effect of Yoga Therapy on Body Mass Index and Oxidative Status, I(1), 1–5.</i>	40	Case control study Body weight, BMI, Blood sugar, MDA (lipid peroxidation) level, Total antioxidant status.	There was significant decline in the body weight, BMI by intervention. Established efficacy of yoga in BMI, Fast & post prandial glucose, lipid peroxidation, & total antioxidant status by doing per day one hour yoga (6 days per week) for one month.	General Practices only used. No special techniques such as uninostril breathing, etc. applied. This is a general study on obesity.
2	Rioux, J. G., & Ritenbaugh, C. (2013). Narrative review of yoga intervention clinical trials including weight-related outcomes. <i>Alternative Therapies in Health and Medicine, 19(3), 32–46.</i>	56 studies	This narrative review compared various clinical trials of yoga intervention for obesity. In various journal like Pub Med, Psych INFO, Web of Science were searched and extracted data such as method used results etc. are tabulated for comparison.	Many of the recent studies are covered in this. The data comparison is available at one place.	This is very informative comparative study of various researches done on obesity so far.
3	Seo, D. Y., Lee, S., Figueroa, A., Kim, H. K., Baek, Y. H.,	20	Case control study Body weight, BMI, Fat mass, Fat free	Eight week yoga asana intervention	Efficacy of yoga asana on obesity

	Kwak, et.al., (2012). Yoga training improves metabolic parameters in obese boys. <i>The Korean Journal of Physiology & Pharmacology : Official Journal of the Korean Physiological Society and the Korean Society of Pharmacology</i> , 16(3), 175–80.		mass, BMR, Fat percentage. Lipid profile.	affects reducing obesity parameters of BMI, Fat mass, were significantly reduced.	parameters established. (No much change in blood lipid profile except Total Cholesterol). Metabolic effects of yoga training especially Pranayama or special breathing techniques not covered.
4	Ross, A., & Thomas, S. (2010). The health benefits of yoga and exercise: a review of comparison studies. <i>Journal of Alternative and Complementary Medicine</i> , 16(1), 3–12.	81 studies	Narrative Review of PubMed studies on Yoga and Exercise.35 comparison, 16 controlled, and 30 uncontrolled studies. Comparison of yoga and exercise is done with literature review.	Yoga intervention found equal or superior to physical fitness programmes for both healthy and diseased.	Difference in Yoga and exercise modalities affecting nervous system, endocrine glands etc. are not covered.
5	Shinde, N., Shinde, K.J., Khatri, S.M., Hande, D. (2013). A Comparative Study of Yoga and Aerobic Exercises in Obesity and its Effect on Pulmonary Function. <i>Journal of Diabetes & Metabolism</i> , 4(4).	60	Prospective Comparative Cross sectional study in Rural community. Body weight, BMI, Pulmonary functions, Forced expiratory volumes, Maximum voluntary ventilation.	Obesity can be associated with respiratory diseases. Yoga is useful for reducing weight and for pulmonary illnesses. BMI reduced from 30 to 27 kg/m ² in one year.	Obesity is casual/ linked to respiratory problems.
6	Telles, S., Dash, M., & Naveen, K.V. (2009). Effect of yoga on	291 (Intervention 146, Control 145)	RCT (This is relevant to sedentary work). Body flexibility,	Significant decrease in the frequency, intensity and	Relevant for sedentary jobs wherein obesity is

	<p>musculoskeletal discomfort and motor functions in professional computer users. <i>Work (Reading, Mass.), 33(3), 297–306.</i></p>		<p>Cornell Musculoskeletal Discomfort Questionnaire (CMDQ), Hand grip strength, Tapping speed.</p>	<p>degree of interference due to musculoskeletal discomfort, increase in bilateral hand grip strength, the right hand tapping speed, and low back and hamstring flexibility by 60 days. Yoga useful for sedentary work.</p>	<p>prevalent. This is not a specific study on obese subjects. Precautions for large no of dropout learned. (More than 40% dropout found in this study).</p>
7	<p>Tundwala, V., Gupta, R. P., Kumar, S., Singh, V. B., Br, S., Dayal, P., & Prakash, P. (2012). A Study on Effect of Yoga and Various Asanas on Obesity , Hypertension and Dyslipidemia. <i>International Journal of Basic and Applied Medical Sciences, 2(1), 93–98.</i></p>	<p>150 (Yoga group 75 and Control group 75).</p>	<p>RCT BMI, Waist Hip Ratio, Systolic Diastolic pressure, LDL, HDL, Triglyceride, Total cholesterol.</p>	<p>Efficacy of yoga on obesity parameters such as BMI, Waist Hip Ratio, and Lipid profile parameters were found. Duration was 3 months with various postural and breathing techniques.</p>	<p>Special yoga practices not covered. Specially designed practices for obesity can be applied in subsequent studies.</p>
8	<p>Doshi, D. R., & Jogsan, Y. A. (2012). A Study on Impact of Yoga on Self-Control in Obese. <i>Internationa Journal of Scientific and Research Publication, 2(8), 2010–2012.</i></p>	<p>13</p>	<p>Case control study Body weight, Self-control questionnaire.</p>	<p>Impact of yoga on self-control noted in 10 days.</p>	<p>27 general yoga practices were used. No special practice and its effect noted. This was a short term study.</p>

9	Telles, S., Sharma, S. K., Yadav, A., Singh, N., & Balkrishna, A. (2014). A comparative controlled trial comparing the effects of yoga and walking for overweight and obese adults. <i>Medical Science Monitor : International Medical Journal of Experimental and Clinical Research</i> , 20, 894–904.	68	RCT Two groups- Yoga and walking groups. Anthropometry, Biochemical, Body composition, Postural strengths, Hand grip strengths.	BMI, Waist circumference, Hip circumference, Lean mass, Body water, and Total cholesterol decreased. Serum leptin increased, LDL decreased in yoga group.	This is a short term study of 15 days.
10	Telles, S., Naveen, V. K., Balkrishna, A., & Kumar, S. (2010). Short term health impact of a yoga and diet change program on obesity. <i>Medical Science Monitor : International Medical Journal of Experimental and Clinical Research</i> , 16(1), 35–40.	47	Single group longitudinal trial. BMI, WC, HC, Mid arm circumference, Body composition, Postural stability. Hand grip strength, Biochemical measurements.	Found significant reduction BMI, Lean mass, Water content, WC, HC, Total cholesterol, HDL, and serum leptin levels.	This is a short term (6 days) intervention.
11	Telles, S., Singh, N., Bhardwaj, A. K., Kumar, A., & Balkrishna, A. (2013). Effect of yoga or physical exercise on physical, cognitive and emotional measures in children: a randomized controlled trial.	98 38 Male, 68 Female	RCT Physical fitness- BMI, Hand grip strengths etc., Stroop colour word test and other scales.	Increase in Self-esteem, BMI and Improved colour word naming.	BMI showed increase towards normal value.

	<i>Child and Adolescent Psychiatry and Mental Health</i> , 7(1), 37.				
12	Jorakate, C., Kongsuk, J., Pongduang, C., Sadsee, B., & Chanthorn, P. (2015). Effect of yoga training on one leg standing and functional reach tests in obese individuals with poor postural control. <i>Journal of Physical Therapy Science</i> , 27(1), 59–62.	16	RCT Body weight, BMI, Static dynamic balance. Systolic diastolic pressure, Heart rate.	Static dynamic balance improved after 4 weeks of yoga training for obese.	
13	Dhananjai, S., Sadashiv, Tiwari, S., Dutt, K., & Kumar, R. (2013). Reducing psychological distress and obesity through Yoga practice. <i>International Journal of Yoga</i> , 6(1), 66–70.	272 (Divided into 2 groups -205 Yoga and 67 Aerobic).	Parallel group. Body weight, BMI, WC, HC, WHR, Depression and Anxiety scores.	Anthropometric parameters improved more in Yoga group. The anxiety & depression scores improved in Yoga group.	
14	Madigan, C. D., Jolly, K., Lewis, A. L., Aveyard, P., & Daley, A. J. (2014). A randomised controlled trial of the effectiveness of self-weighing as a weight loss intervention. <i>The International</i>	183 (92 interventions and 91 Control group).	RCT Body weight, Questionnaire.	Self-weighing is not linked with more weight loss in Obese.	

	<i>Journal of Behavioral Nutrition and Physical Activity</i> , 11(1), 125.				
15	Littman, A. J., Bertram, L. C., Ceballos, R., Ulrich, C. M., Ramaprasad, J., McGregor, B., & et. al., (2012). Randomized controlled pilot trial of yoga in overweight and obese breast cancer survivors: effects on quality of life and anthropometric measures. <i>Supportive Care in Cancer : Official Journal of the Multinational Association of Supportive Care in Cancer</i> , 20(2), 267–77.	63 (Yoga group 32, Control group 31).	RCT Body weight, BMI, WC, HC, Questionnaires for quality of life.	Efficacy of yoga in improving anthropometric parameters. Found decrease in WC and improvement in quality of life.	
16	Carter, M. C., Burley, V. J., Nykjaer, C., & Cade, J. E. (2013). Adherence to a smartphone application for weight loss compared to website and paper diary: pilot randomized controlled trial. <i>Journal of Medical Internet Research</i> , 15(4).	128 (to 3 groups 43 smartphone group, 43 web based group and 43 paper diary group).	RCT Body weight, BMI, Body fat.	Smart phone intervention is for weight reduction. Reduction in BMI was more in smart phone group than in the web based group and in the paper diary group.	

17	Williams, L. T., Hollis, J. L., Collins, C. E., & Morgan, P. J. (2014). Can a relatively low-intensity intervention by health professionals prevent weight gain in mid-age women? 12-Month outcomes of the 40-Something randomised controlled trial. <i>Nutrition & Diabetes</i> , 4(5), e116.	54 (Intervention group 28 and Control group 26).	RCT Body weight, Fat, Lean mass and other body composition parameters, Lipid profile, Systolic Diastolic Pressure.	BMI, Body weight reduced for the intervention group significantly.	Effectiveness of motivational Interviewing, Counseling and other low intensity interventions.
----	--	---	---	--	---

3.1 Measurements of obesity

Obesity is generally assessed by-following:

- a) The body weight and Body mass index (BMI)
- b) Waist circumference
- c) Waist hip ratio
- d) Body composition parameters
- e) Ponderal Index (PI = Height in inches /Cube root of weight in lbs, PI <13 indicate Obesity)
- f) Broca's Index (Height in cm -100 = ideal weight in Kg)
- g) Corpulence Index (Weight of person/Desired weight of person. If ratio is> 1.2 indicate obesity)

Further, the BMI is most widely used parameter to assess the overweight and obesity. It is ratio of weight in kg to height in meter square. The grades of BMI are as given below:

Table- 4a BMI grades

Sl No	Grade	BMI Kg/m ²	Obesity Stage
1	Underweight	<18.5	
2	Normal	18.5 to 24.9	
3	Over weight	25.0 to 29.9	
4	Obesity I	30.0 to 34.9	I
5	Obesity II	35.0 to 39.9	II
6	Extreme Obesity	≥ 40.0	III

As per International Association for the Study of Obesity (IASO) 2000, WHO has recommended a cutoff value of 23 Kg/m² for Asians for defining overweight. This is due to the high increase in health risk found across the Asian countries (Mini Sheth, 2011) .

Table- 4b BMI grades

Sl. No	Classification	BMI kg/m ²	Obesity Stage
1	Undernourished	<19	--
2	Normal	19 to 23	--
3	Over weight	23 to 24.9	--
4	Obesity	25 to 29.9	I
5	Severe Obesity	>30	II

3.2 Classification of Obesity

Further, the obesity may be classified as different types, as given below (Mini Sheth, 2011):

- i. Android and Gynoid Obesity based on distribution of body fat
- ii. Developmental and reactive obesity
- iii. Juvenile onset and Adult onset Obesity
- iv. Lymphatic body type (large proportion of fat deposited in limbs)

Previous study shows that diagnosis of obesity should be based on only anthropometric measures lack the full information (Garvey, 2014). Hence along with anthropometric parameters Body composition parameters and various psychological parameters can be used for fully describing obesity.

3.3 Epidemiology

Obesity is a worldwide epidemic. Study shows that non-communicable diseases (NCDs) are the main cause of death in many parts of the world (Webber et al., 2014). Increase in obesity is major cause of rising NCDs and obesity has big share on future disease burden.

3.4 Etiology

Appetite regulation (Mini Sheth, 2011):

The appetite of an individual is controlled by feeding and satiety centers of hypothalamus. The excessive food intake involves different factors. Also hypothalamus has important role in control of macronutrients. The disorders in functioning of hypothalamus can result in obesity.

Following are the theories and etiological factors resulting in obesity (Mini Sheth, 2011):

Following are the theories of weight control (Mini Sheth, 2011):

- i. Theories of Body weight regulation: Obesity can be due to increase in size or the number of fat cells. Normally an individual will have 30-35 billion fat cells. To reduce the weight it is

possible to reduce the size of fat cells only. The number of cells will not be reduced. Once the number of cells is formed it cannot be reduced.

- ii. Set point theory-ideal biological weight genetically fixed
- iii. Enzyme and hormone theories
- iv. Fat cell –number of fat cells fixed
- v. Lipostatic –satiety signal to brain by fat cells
- vi. Gut peptide –peptide effect on hypothalamus
- vii. Push and pull theory-knowingly taking excess nutrients-behavioral
- viii. Thermogenesis-BMR, Adaptive thermogenesis

Further the various etiological factors resulting in obesity are as below (Mini Sheth, 2011) :

i. Hereditary and genetic factors:

Genes cause increasing hunger and hence there is a tendency to eat more food.

ii. The hormones secreted by endocrine glands are directly or indirectly influence fat metabolism and obesity. They include leptin, estrogen insulin and growth hormones (Grantham & Henneberg, 2014). The appetite lipogenesis, lipolysis etc., will depend on the functioning of these hormones. The stress will make imbalance in the system and will lead to obesity. Study shows that (Chou & Mantzoros, 2014) leptin affects obesity and hyper leptinemia play a role in hypo gonadism linked with obesity and type 2 diabetes.

iii. Biological factors:

iv. Physiological factors

v. Psychological factors

vi. Social and Cultural factors

vii. Age: (e.g. metabolic rate of persons slows down after the age of 30. If no change in calorie intake, the individual gains weight. Even if the body weight increases the metabolic rate does not get affected as weight increase may be due to fat increase.

viii. Gender

ix. Eating habits- Easy availability of junk food in urban setting

x. Life style factors

xi. Quality of food and Frequency of meals

xii. Lack of exercise due to social and other factors

xiii. Lack of knowledge (e.g. people are unaware of calorie value of food)

xiv. Virus induced obesity was reported since 1982 and study shows that viruses are cause for obesity (Atkinson, 2007).

Thus, there is large number of factors causing obesity ranging from genetic, hypothalamic dysfunction, to life style and socio cultural globalization factors.

The disturbances of mind cause psycho emotional overload, triggering a series of weight gaining effects, such as over eating lack of sleep lack of physical exercise. Since psychological and emotional distress leads to obesity, the mind control will give better outcomes, in reducing the obesity (Hemmingsson, 2014).

3.5 Therapy available

The strategies for the management of obesity are (Mini Sheth, 2011):

- i. Assessment of exercise
- ii. Willingness and commitment to reduce weight
- iii. Estimation of energy requirement
- iv. Setting realistic goals for weight loss
- v. Behavioral and motivational therapy

- vi. Dietary modifications
- vii. Careful exercise plan

In the drug therapy the most available weight loss medications are appetite suppressant which decreases appetite by increasing serotonin or catecholamine. There are other options to control obesity such as gastric bypass surgery, introduction of gastric balloons and lipo suction.

Treatment for obesity is a complex issue since causes of obesity are many. Previous studies show that standard behavioral therapy with self-help elements will be cost effective (Papp, Czeglédi, Udvardy-Mészáros, Vizin, & Perczel Forintos, 2014). Also study indicates that by physical active life style, approximately forty percentage of genetic obesity can be managed (Li et al., 2010).

Yoga will give mastery over mind and enable the person to change life style and behavioral modifications.

3.6 Complementary and Alternative therapies for weight reduction

The obesity is recognized as a disease in complementary and alternative medicine (CAM) systems of Ayurveda Yoga and Naturopathy. Etiology of obesity and treatments are different in different CAM systems. However these systems are holistic and have the integrated approach of considering body and mind together and the disease is treated from its root.

In Ayurvedic treatment aims at removal of cause of the disease and restoration of *doṣika* equilibrium. Generally management of obesity is divided into three parts (Gopalani & Sarmandal, 2013) as given below.

- i. Preventive therapy
- ii. Purification measure
- iii. Curative therapy

Balancing of *Vāta Pitta and Kapha* along with depletion of *meda dhātu* is the aim of treatment. In the therapy, there are external and internal purifications. *Ācārya Caraka* also specify dietary management for obesity (Gopalani & Sarmandal, 2013).

In Naturopathy system as per Hippocrates, it is said that nature cures and not the physician. Nature cure is a treatment which removes the basic cause of the disease by use of *Pancamahābhūta* (the five basic elements of Earth, Water, Fire, Air and Space). This is also a way of life harmonizing body mind complex. Though the naturopathy is relatively recent, the methods techniques and philosophy of naturopathy are ancient.

The fresh air, sunshine, proper diet, exercise and relaxation, right mental attitude and meditation will make sound body mind complex. As per naturopathy, obesity is abnormal condition because of violation of natural laws. When toxin accumulates in the body disease occurs. All forms of disease including obesity are due to accumulation of waste material. These wastes are to be removed through organs of elimination. Faulty living habits such as taking junk food cause obesity. The body contains self-healing mechanisms and one should allow the body for healing. Fasting is one of the best techniques employed in naturopathy. Fasting is a voluntary abstinence from food for a particular length of time. The practice of fasting is one of the ancient customs. Other methods used in naturopathy are, various therapeutic baths, cold compress, heating compress, hip bath, spinal bath, steam bath and enema. Mud therapy, massage and sun bath are also used in naturopathy for treatment of obesity.

Further, the weight reduction was observed due to yoga practice, while conducting studies on various other diseases. In one of the review studies, on the effect of yoga on diseases included 32 articles published during 1980 to 2007. The studies concluded that the yoga is useful in reducing body weight (Yang, 2007).

Another study concludes that yoga will decrease Type 2 diabetes cardio metabolic risk factors and increase self-efficacy of physical activity, leading to weight reduction (Yang et al., 2011).

One previous study regarding effect of yoga on people with type 2 diabetes mellitus found reduced BMI, and anxiety (Kosuri & Sridhar, 2009). In another study on yoga and aerobic exercise it was noted that yoga practice is helpful in weight loss (Shinde, et al., 2013). Also the eight folded *Aṣṭāṅga* yoga was found beneficial as a weight loss strategy in a predominately Hispanic population (Benavides & Caballero, 2009).

There are previous studies (Joshi, Deole, Vyas, & Dash, 2009; Tundwala et al., 2012) showing management of obesity and overweight through certain yogic practices and other complimentary therapies. Previous study also shows that yoga practice is beneficial for behavioural change in obese (Bernstein, Bar, Ehrman, Golubic, & Roizen, 2013).

Previous study (Kristal, Littman, Benitez, & White, 2005) showed that the regular yoga practice was associated with weight reduction in middle aged subjects.

Hence the complementary and alternative medicine including yoga have important role in management control and prevention of obesity.

3.7 Need for present study

Yoga practice gives control over mind. One of the main causes of obesity is excessive mental stress. The integrated approach of yoga therapy addresses several aspects of human consciousness and hence will be effective for control and prevention of diseases including obesity. It is noted that there are yoga interventions, showing positive effects on control of obesity (Chowdhury, Datta, & Rao, 2013; Gokal, Shillito, & Maharaj, 2007; Kay, 2007; Yoshihara, Hiramoto, Sudo, & Kubo, 2011). The current obesity study is specifically on urban male adults.

i. The literature survey indicates that the yoga practices may be effective for reducing the obesity. However using IAYT yoga module exclusively on adult male and in an urban setting for Six months period, no Randomized Controlled Trial has not been carried out earlier.

ii. The study (Rioux & Ritenbaugh, 2013) of review of clinical trials of yoga interventions indicate that a component of meditation will be very useful along with other components, for weight reduction. In IAYT module, component of special meditations from advanced techniques were included.

iii. In the references, general yoga practices were adopted and not IAYT with longer duration for male.

Hence there was a scope and gap of research for checking the effect of IAYT yoga practices in urban adults of Mumbai who are at the verge of developing metabolic disorders.