Part I

THE CONCEPT OF AHARA FOR THE MANAGEMENT OF MADHUMEHA ACCORDING TO YOGA AYURVEDA NATUROPATHY AND MODERN MEDICAL SCIENCE

Part II

VALIDATING INTEGRATED YOGIC MODULE IN TYPE 2 DIABETES MELLITUS

By

Pradeep H Shetty

Towards partial fulfillment of M.Sc. (Yoga and Education)
Under the guidance of

Dr Satyam Tripathi, Dr Sudheer Deshpande, and Dr Tikhe Sham Ganpat

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DECLARATION

I hereby declare that the work presented in this dissertation is done by me under the guidance of Dr Sudheer Deshpande, Dr Satyam Tripathi and Dr Tikhe Sham Ganapat.

I would also like to declare that this work entitled

Part 1

THE CONCEPT OF AHARA FOR THE MANAGEMENT OF MADHUMEHA ACCORDING TO YOGA AYURVEDA NATUROPATHY AND MODERN MEDICAL SCIENCE

Part 11

VALIDATING INTEGRATED YOGIC MODULE IN TYPE 2 DIABETES MELLITUS.

Has not previously formed the basis of any degree, diploma, membership or similar titles.

Place Bengaluru.

Date: 19/12/2012 Pradeep H Shetty.

CONTENTS

STANDARD TRANSLITERATION CODE

a	=	अ	ṅa	=	ङ	pa	=	प
ā	=	आ	ca	=	च	pha	=	फ
i	=	इ	cha	=	छ	ba	=	ब
ī	=	ई	ja	=	ज	bha	=	भ
u	=	उ	jha	=	झ	ma	=	म
ū	=	ऊ	ñ	=	ञ	ya	=	य
e	=	ए	ṭa	=	ट	ra	=	र
ai	=	ऐ	ṭha	=	ठ	la	=	ल
o	=	ओ	ḍa	=	ड	va	=	व
au	=	औ	ḍha	=	ढ	sa	=	स
m	=	अं	ṇa	=	ण	śa	=	श
ḥ	=	अः	ta	=	त	ṣa	=	ष
ka	=	क	tha	=	थ	ha	=	ह
kha	=	ख	da	=	द	kṣa	=	क्ष
ga	=	ग	dha	=	ध	tra	=	त्र
gha	=	घ	na	=	न	jña	=	ज्ञ

ṛ = ऋ ṝ = ॠ

1. INTRODUCTION

In the integrated approach of yoga therapy food, diet and nutrition plays an important role. There are many texts of yoga which deal with Ahara for promotion of good health, for building stamina, preventing and curing diseases. Diabetes mellitus is a metabolic disorder. For the management of DM, knowledge of Ahara (Food) is essential.

Hathayoga ,pradipika Bhagwadgeeta, Taittiriya Upanishad, Gheranda Samhita and Ayurvedic texts have mentioned elaborately on Ahara. In the yogic texts effect of food on the mind and behavior of individuals is also considered in addition to the nutrient value.

As we understand the cell is the functional and structural unit of the living being. For cells to work they need energy .Food is the main source of energy. Food is any substance that is consumed by any living being for maintenance of its life .

Modern science on nutrition is based on calorie theory. For the function of each cell energy is required . it is measured in terms of calorie. Food is the main source of energy. Modern science is more concerned with the nutritive value of food. It does not take into consideration the effect of food on mind. It classifies food as carbohydrates, Protein Vitamins Minerals and water.

Human being are omnivorous .The source of food may be from the plants or animals .,the food habits of mankind varies from one geographical region to another. Some people are vegetarians while remaining majority of the human population are non vegetarians. There are religious and social regulation restrictions which regulate what one eats or what not to eat .

Plants take CO2 from atmosphere sunlight and water from soil to form series of complex carbon chains called starches. These starches are digested in digestive systems and they are absorbed in simpler compounds. Cells use oxygen to burn carbohydrates which results in production of energy and carbon dioxide is released into atmosphere through lungs.

Study of nutrition investigates the metabolic and physiological responses of the body to diet. It explains how the food after digestion undergoes series of biochemical steps.

The cells, tissues and organs of human body , plants and other animals comprises of many chemical compounds like fatty acids, amino acids ,carbohydrates , vitamins, fibres. Many

elements like hydrogen nitrogen, carbon, phosphorus, calcium, iron , zinc ,magnesium are present in these compounds. Good nutritious food should contain all these in required quantity.

In contrast to modern nutrition the yogic concept of food takes into consideration the total dimension of human existence. Apart from the atoms and molecules with which our gross physical body is made of Prana, mind, intellect, emotions and the spiritual dimension featured by freedom. Yoga is that process by which we bring an integration of the entire personality at all these levels. The stamina of the body is to be developed, the prana should be brought to a nice balance, the mind should be calmed down, the emotion should be stabilized and the intellect should be under total control. A 'Balanced Diet', therefore, according to Yoga is that diet which restores balance at all levels. Only such diets could aid in a Holistic Way of Living (R. Nagarathna, R. Nagendra, 2003).[1]

Poor diet can have an injurious impact on health, causing deficiency diseases such as scurvy, beriberi and kwashiorkor,health threatening conditions like obesity and metabolic syndrome and such common chronic systematic diseases as cardiovascular disease, diabetes and osteoporosis.(www.wikipedia.com).

Diet plays an important role in Ayurveda system of healing. A wholesome diet is essential for maintaining health and to prevent diseases. According to Ayurveda all disease are caused by three doshas i.e. vata, pitta, kapha. In turn these doshas are vitiated due to wrong eating habits, intake of improper diet in large quantity. The diet in Ayurveda is prescribed to people by taking into consideration different aspects like the level of Ama (toxins) in the body, the predominant dosha, age etc. Ayurveda emphasizes disciplined life in tune with cosmic laws in addition to taking wholesome food, seasonwise

2. REVIEW OF LITERATURE ON PREVIOUS STUDIES ON TYPE II DIABETES MELLITUS DONE AT S-VYASA IN A TABULAR FORM

Sr. No.	Name of the Author	Course	Year	Topic	Findings
1	Poonam Surindara Joshi	M.Sc	2010-11	A comparison of two techniques for controlling type II diabetes	In this study, two different modes of administering Yoga were evaluated. The slow practice group(SPG) and the dynamic practicing group (DPG) were assessed for FBS,PPBS, insulin and ADDQL.No statistically significant changes were observed in FBS and PPBS for either of groups. However, a marginal decrease and increase in FBS and PPBS was noted for SPG and DPG respectively.Similarly marginal increase was observed in ADDQL scores in both the groups showing that both dynamic and relaxation yoga can produce almost similar changes. More weight reduction was noticed in dynamic practice group as compared to slow practice group.
2	Sumati Badhei	M.Sc.	2010-11	Effect of integrated approach of Yoga therapy on sensor perception in type 2 diabetes	39 subjects with diabetic neuropathywere given integrated approach of yoga therapy for diabetic peripheral neuropathy for 14 days .The result of studyshowed that IAYT improves the vibration perception,thermal sensation,pinprick

					sensation,touch sensation in diabetic peripheral neuropathy patients.
3	Viral Jayshankar Raval	M.Sc.	2010-11	: Immediate effect of mind imagery technique (MIRT) on blood glucose level in type 2 diabetes	The study has shown that there was a decrease in post prandial blood glucose after a week long residential program of integrated yoga in patients with uncomplicated type 2 diabetes mellitus.There was no significant change in blood glucose levels immediately after the practice of a single session of MIRT or DRT.
4	M R Usha Rani	M.Sc.	2008-09	Determinants of yoga therapy in a corporate hospital setting	This long term integrated yoga based life style program and exercise based life style program conferred beneficial effects in subjects with type II Diabetes mellitus in (i) reducing blood glucose, HbA1c triglycerides, VLDL and total cholesterol levels, and (ii)Yoga is better than exercise in increasing HDL , decreasing LDL and reducing the requirement of oral hypoglycemic agents.
Sr. No.	Name of the Author	Course	Year	Topic	Findings
5	B N Prakash	M.Sc.	2005-06	Effect of Yoga on Mental An Sensitivity in Pre-Diabetes	The study showed significant improvement 0f mental attention of the students and teachers affected by tsunami disaster following yogic intervention.

6	Dr Ashween Bilagi	M.D.	2011-12	Effect of intensive integrated yoga on in- sulin resistance in Type II diabetes	: IIYT reduces IR, BMI, body fat, visceral fat, triglycerides and hyperglycemia; and increases lean body mass within two weeks. Future work through RCT is necessary to confirm these result
7	. Dr Chincholikar Nagraj	M.D.	2011-12	Influence of IAYT on Nerve Conduc- tion in Type II Diabetes	People practicing yoga have been shown to have better nerve conduction velocity, hence suggesting role for yoga as an adjuvant in the management of type 2 diabetes induced nerve damage
8	. Dr Asha B V	M.D.	2011-12	P300 responses in diabetics practicing yoga or physical exercise: a cross sectional study	Amplitude of P300 was non-significantly higher in yoga group when compared to control group, indicating facilitated information processing. Shorter latency of P300 in both groups, indicate regular physical activity maintains normo-glycaemia and normal cerebro-vascular perfusion and thus does not delay cognition as evident through normal P300 responses. MMSE scores indicate both the groups were normal in cognitive function. BMI measurements in both groups are normal indicating regular physical activity leads to decrease in body fat and increase in the

					lean body mass.
9	Dr Ashwini R	M.D.	2011-12	Influence of regular Yoga therapy on type II Diabetes and cognitive functioning	Type2diabetics into regular yoga therapy show Similar cognitive functioning(speed, attention, executive Functioning, verbal learning and memory ability, comprehension) ability and stress level are low like healthy volunteers in the same age range, endocrine functions are within normal range
10	Dr Satyam Tripathi	M.D.	2011-12	Validation of an integrated Ayurveda-Yoga module for residential treatment of patients with type 2 diabetes mellitus – A compilation from traditional literature	First of this type of study using modern scientific methods for validating a protocol. This makes the module acceptable and generalisable. This validated protocol has to be tested through randomized control studies to prove its efficacy. This may be refined by taking the opinion of different experts from different schools of äyurveda to make it more acceptable as a protocol to be used in all äyurveda centers in the county and abroad

3. LITERARY SEARCH

3.1 AIMS

To study the ancient Indian texts in the light of food or Ahara for the management of diabetes mellitustype2.

3.2 METHODOLOGY OF STUDY

The yogic texts ,Vedas. Upanishads ,Bhagwadgeeta and Ayurveda were referred to get the classical support for the food or diet that can be useful to Diabetes Mellitus.

3.3 TEXTWISE PRESENTATION

3.3.1 CONCEPT OF AHARA ACCORDING TO ANCIENT TEXTS

The ancient texts like Bhagwad Geeta, Hathayoga pradipika ,Gherand Samhita, Shiva Samhita. And Ayurvedic texts like Charaka Samhita,Sushrut Samhita have explained in detail about the food, kind of foods, way of consumption, the food that should be avoided in order to maintain good mental and physical health. For the progress in the spiritual life maintaining the body health and to keep it strong and free from the diseases was essential. For this balanced and wholesome food is necessary.

a) The yogic concept of food takes into consideration the total dimension of human existence. Apart from the atoms and molecules with which our gross physical is made of, we all possess Prana, mind, intellect, emotions and the spiritual dimension featured by Freedom. Yoga is that process by which we bring an integration of the entire personality at all these levels. The stamina of the body is to be developed, the prana should be brought to a nice balance, the mind should be calmed down, the emotions should be stabilized and the intellect should be under total control. A "Balanced Diet", therefore, according to yoga, is that diet which restores balance at all levels, Only such diets could aid in a Holistic Way of Living.(R. Nagarathna,R.Nagendra,2003).[2]

b) Bhagwadgeeta and Ayurvedic books like CarakaSamhita and Sushruta Samhita have classified food into 3 categories namely, sattva, rajasik and tamasik depending upon the effect they produce on the body and mind of an individual

c) Ayurvedic texts like CarakaSamhita and Sushruta Samhita, food is classified into six taste categories like sweet, sour, salty, bitter, pungent and astringent. It is aimed to improve immunity by including all these 6 tastes in every meal we eat.

3.3.2 CONCEPT OF AHARA ACCORDING TO BHAGAVADGITA

In Bhagavad Gita there are eighteen chapters. Lord Sri Krishna the Yogacharya has explained in detail the four paths mainly Karma Yoga, Raja Yoga, Bhakti Yoga and Jnana Yoga for achivement of liberation from the cycles of birth and death. He has also explained the food which Yogis should eat in order to progress in the path of yoga.

The shlokas on food are found in chapter NO 17. In the 17 th chapter the detils of the food and its regulations are explained in order to maintain good health physically, mentally that aids to progress in Sadhana.

According to Bhagavad Gita all the human beings are classified into three categories according to their nature, Sattvik, Rajasik and Tamasik. So the taste of the people also differ according to their Gunas (Qualities).

आयुः सत्त्वबलारोग्यसुखप्रीतिविवर्धनाः

रस्याः स्निग्धाः स्थिरा हृद्या आहाराः सात्त्विकप्रियाः

Āayu□ sattvabalārogyasukhaprītivivardhanā□

Rasyā□ snigdhā□ sthirā hradyā āhārā□ sāttvikapriyā□

-(B.G.17.8)

The food which augment vitality, energy, strength, health, cheerfulness and appetite which are saveoury and oleaginuous substantial and agreeable are liked by the Sattvika**.**

The Sattvik food gives vitality, strength, health, cheerfulness and good appetite. This Sattvik food strengthens physical body and mental equanimity. It facilitates flow of Prana harmoniously in the body and it is the most recommended type of food for the seekers of the Truth.

Sattvik food is available easily in the nature. They comprise of fresh fruits, vegetables, cow milk, butter, ghee, nuts, seeds, honey, grains, cereals grown in the organic farming without the use of chemicals and fertilisers.

कट्वम्ललवणात्युष्णतीक्ष्णरुक्षविदाहिनः

आहारा राजसस्येष्टा दुःखशोकामयप्रदाः ॥ ९ ॥

ka□vamlalava□ātyu□□atīk□□aruk□avidāhina□

āhārā rājasasye□□tā du□khaśokāmayapradāa□||9|| (B.G. 17-9)

The food that are bitter, sour, saline, excessively hot, pungent, dry and burning are liked by the Rajasika and are productive of pain, grief and disease.

Rajasik food stimulate body and mind.It destroys equanimity of mind, excitng passions which leads man to behave arrogantly. The people eating Rajasik food indulge in violence.

Rajasik food include spices, stimulants like drugs, coffee ,tea, fish, tobacco, gutka, icecream. Such food cause distress, misery and disease.

The people suffering from diabetes, should avoid rajasik foods,since it disturbes metabolism of body. They should refrain from taking cakes, beverages, soft drinks, with sweeteners as it increases blood glucose.

अतयमम् गतरसम् पुति पर्युसितम् च यत्

ऊच्चिस्तमपि चमेध्यम् भोजनम् तमस्प्रियम्

atayamam gatarasam puti paryusitam ca yat

ūccistamapi camedhyam bhojanam tamaspriyam (B.G. 17-10)

That which is stale,tasteless,stinking, cooked overnight,refuse and impure is the food liked bythe Tamasika.

The tamasik diet does not nourish the physical body or mind. It makes person dull, lethargic, indolent. The clarity of intellect also gets reduced.

The food that is tasteless,cooked overnight,foul smelling, decomposed, devoid of prana, left over food are the tamasik food.Tamasik food include meat, alcohol fermented,refrigerated food.

Patients suffering from any disease should not take tamasik type of food as it is not nutritious, reduces prana in the body and affects digestive system of the body.

For patients suffering from metabolic disorders like diabetes mellitus sattvik food consisting of fresh fruits, vegetables, sprouts, and milk is most ideal.

3.3.3.TAITIRIYA UPANISHAD

We find description about ahara in taitiriya upanishad in the Bhrigu valli anuvakas second and also from 7th to 10th anuvakas.

Bhrigu a seeker of truth approached his father who was a realised soul about Brahman.The father asked him to meditate and find the truth himself.After observing the austerities he comes to his father and tells him what he has found.

अन्नं ब्रह्मेति व्यजानात्। अन्नाध्ध्येव खल्विमानि भूतानि जायन्ते। अन्नेन जातानि जीवन्ति। अन्नं प्रयन्त्यभिसंविशन्तीति। तद्विज्ञाय। पुनरेव वरुणं पितरमुपससार। अधीहि भगवो ब्रह्मेति। तꣳ होवाच। तपसा ब्रह्म विजिज्ञासस्व। तपो ब्रह्मेति। स तपोऽतप्यत। स तपस्तप्त्वा॥ १॥ इति द्वितियोऽनुवाकः॥

anna□ brahmeti vyajānāt| annādhdyeva khalvimāni bhūtāni jāyante| annena jātāni jīvanti| anna□ prayantyabhisa□viśantīti| tadvijñāya| punareva varu□a□ pitaramupasasāra| adhīhi bhagavo brahmeti| ta□ hovāca| tapasā brahma vijijñāasasva| tapo brahmeti| sa tapo'tapyata| sa tapastaptvā||1|| iti dvitiyo'nuvāka□||

Brigu says that food is Brahman because it is from food that all beings are born.For sustaining food is essential. And again all the living being dissolve into food when they die. He again approached his father and said "o lord, please teach me Brahman". The father asked him to practice austerities and know Brahman.

Brigu came to the conclusion that the gross world is the manifestation of Brahman.The universe has emerged from food and again it merges back to food.He tells his father the same thing.

अन्नं न निन्द्यात्। तद्व्रतम्। प्राणो वा अन्नम्।

शरीरमन्नादम्। प्राणे शरीरं प्रतिष्ठितम्।

शरीरे प्राणः प्रतिष्ठितः। तदेतदन्नमन्ने प्रतिष्ठितम्।

स य एतदन्नमन्ने प्रतिष्ठितं वेद प्रतितिष्ठति ।

अन्नवानन्नादो भवति ।

प्रजया पशुभिर्ब्रह्मवर्चसेन । महान् कीर्त्या ॥ १ ॥

इति सप्तमोऽनुवाकः ॥

Annam na nindyāt । tadvratam । prāṇo vā annam ।
śarīramannādam । prāṇe śarīraṁ pratiṣṭhitam ।
śarīre prāṇaḥ pratiṣṭhitaḥ । tadetadannamanne pratiṣṭhitam ।
sa ya etadannamanne pratiṣṭhitaṁ veda pratitiṣṭhati ।
annavānannādo bhavati ।
prajayā paśubhirbrahmavarcasena । mahān kīrtyā ।। 1।।
iti saptamo'nuvākaḥ ।।

We should not speak ill of the food. It is a religious vow .Life is food. The body consumes food .Therefore it is called as the annada or eater..Body is dependent on food because its very existence is because of life. Similarly life is also dependent on body. Both the life and body are mutually dependent. Similarly one kind of food is dependent on the another kind of food.

One who has the knowledge that both life and body are dependent on each other becomes famous. He gets large quantity of food and he loves to eat it. He will have many children and possess many animals. He will be respected and he will shine with the spiritual knowledge and he will become spiritual teacher.

In this Anuvak the importance is given to food because food is the gateway to the knowledge of Brahman one cannot progress in life if they don't have a healthy body.

न परिचक्षीत । तद्व्रतम् । आपो वा अन्नम

ज्योतिरन्नादम् । अप्सु ज्योतिः प्रतिष्ठितम् ।

ज्योतिष्यापः प्रतिष्ठिताः । तदेतदन्नमन्ने प्रतिष्ठितम् ।

स य एतदन्नमन्ने प्रतिष्ठितं वेद प्रतितिष्ठति ।

अन्नवानन्नादो भवति ।

प्रजया

पशुभिर्ब्रह्मवर्चसेन । महान् कीर्त्या ॥ १ ॥

इत्यष्टमोऽनुवाकः ॥

Annam na paricakṣīta । tadvratam । āpo vā annam ।
jyotirannādam । apsu jyotiḥ pratiṣṭhitam ।
jyotiṣyāpaḥ pratiṣṭhitāḥ । tadetadannamanne pratiṣṭhitam ।
sa ya etadannamanne pratiṣṭhitaṁ veda pratitiṣṭhati ।
annavānannādo bhavati ।
prajayā
paśubhirbrahmavarcasena ।
kīrtyā ।। 1।।
ityaṣṭamo'nuvākaḥ ।।

One shouldnot neglect food .Consider this as a religious injuction.But what is food.Water is nothing but food.And fire consumes that food. So it is called annadam.There is fire or energy in the water.There is also water in the fire.This is an example of food being dependent on food.One who knows this principle of one kind of food being dependent on another, becomes highly successful. He possesses large quantities of food,and he also enjoys eating. He will have many children and a vast amount of animalwealth and he also shines with the glow of spiritual knowledge.He is highly respectedthereby and is well known as a spiritual teacher.

The whole universe is considered to be food according to upanishad. All that exists in the universe living or non living are also part of this FOOD. This universe is made up of 5 basic elements ,space,air,fire,water and earth, which are again interdependent on each other.They support each other.

Apsu jyotih pratishtithim means fire and water related. Jyoti also means energy.There is energy in the water.The whole world is the beautiful manifestation of Brahman.

What the upanishad is saying is to think of these things, food,the mind,the physical universe with the various elements etc, as Brahman. Know them as Brahman, and respect them,take

care of them. They are nothing but Brahman.Brahman by its nature is ananda, bliss,but you have to take care of these other things as well because they are the basis, the foundation,on which you struggle and eventually realise Brahman.

(Swami Lokeshwarananda, 1996)

Ref Swami Lokeswarananda,taittiriya Upanishad,Ramakrishna mission institute of culture,Calcutta,India 1996

बहु कुर्वीत । तद्व्रतम् । पृथिवी वा अन्नम् ।

आकाशोऽन्नादः । पृथिव्यामाकाशः प्रतिष्ठितः ।

आकाशे पृथिवी प्रतिष्ठिता ।

तदेतदन्नमन्ने प्रतिष्ठितम् ।

स य एतदन्नमन्ने प्रतिष्ठितं वेद प्रतितिष्ठति ।

अन्नवानन्नादो भवति ।

प्रजया

पशुभिर्ब्रह्मवर्चसेन । महान्कीर्त्या ॥ १ ॥

इति नवमोऽनुवाकः ॥

Annam bahu kurvīta । tadvratam । pṛthivī vā annam ।
ākāśo'nnādaḥ । pṛthivyāmākāśaḥ pratiṣṭhitaḥ ।
ākāśe pṛthivī pratiṣṭhitā ।
tadetadannamanne pratiṣṭhitam ।
sa ya etadannamanne pratiṣṭhitaṁ veda pratitiṣṭhati ।
annavānannādo bhavati ।
prajayā
paśubhirbrahmavarcasena । mahānkīrtyā ।। 1।।
iti navamo'nuvākaḥ ।।

One should try to increase the quantity of food one has. This is a religious duty. But what is food ? The earth is food . The sky eats this food so it is called annada, the eater. The sky is dependent on the earth. The earth is also dependent on the sky.They are both independent,

one kind of food depending on another. One ,who knows this principle of one kind of food being dependent on another, becomes highly successful.He possesses large qualities of food, and he also greatly enjoys eating. He has many children and a vast amount of animal wealth, and he also shines with the glow of spiritual knowledge. He is highly respected thereby and is well esteemed as a spiritual teacher. (Swami Lokeswarananda, 1996)

कञ्चन वसतौ प्रत्याचक्षीत । तद्व्रतम् ।

तस्माद्यया कया च विधया बह्वन्नं प्राप्नुयात् ।

अराध्यस्मा अन्नमित्याचक्षते ।

एतद्वै मुखतोऽनꣳ राद्धम् ।

मुखतोऽस्मा अन्नꣳ राध्यते ।

एतद्वै मध्यतोऽनꣳ राद्धम् ।

अन्नꣳ राध्यते ।

एदद्वा अन्ततोऽन्नꣳ राद्धम् ।

अन्ततोऽस्मा अन्नꣳ राध्यते ॥ १ ॥

Na kañcana vasatau pratyācakṣīta । tadvratam ।
tasmādyayā kayā ca vidhayā bahvannaṁ prāpnuyāt ।
arādhyasmā annamityācakṣate ।
etadvai mukhato'naṁ rāddham ।
mukhato'smā annaṁ rādhyate ।
etadvai madhyato'naṁ rāddham ।
annaṁ rādhyate ।
edadvā antato'nnaṁ rāddham ।
antato'smā annaṁ rādhyate ।। 1।।

If someone comes and asks for a place to stay, one should not turn him away. This is a religious obligation. And if there is a guest. It is necessary to provide him his needs. This is why wise people say that one should procure food by whatever means necessary. It is as if it has been acquired in anticipation of the guest. This is what wise people say. As the person gives the food he makes it clear that he procured the food by excellent means .i.e. by the skill

of his profession. He is then duly rewarded for this gift in that the food returns to him through excellent means. If he procured the food by means that were not so good i.e., not entirely by his own skill, but by a mixture of skill and bad means then the food returns to him in the same manner. If however he has adopted bad means to procure the food for his guest, the food will return to him in the same manner.

In this shloka the means of procuring the food is given much importance. We have to procure

The food by righteous way and in anticipation of the guests . Atithi Devo Bhava .In indian tradition the guest is considered as God. We should give good hospitality to the guest. We should provide the guest the place to stay and provide nice food.It is said if we take care of the guest God will take care of us and the food will be returned to us in some other way.

If we procure food by bad means God will punish us.We grow what we sow.Therefore to maintain good health we should not only give importance for the nutrient values of food but at the same time we should give equal importance to righteous means of getting food.

In short Taittiriya Upanishad the whole universe is considered as manifestation of food. All that exists in the universe is interdependent on each other , and everything what gets manifested is out of food and it returns to the food when it perishes.

In order to be healthy one should be very careful as to how one procures the food . It should be by good means with some skills. We should take care of our guests and provide good food.

In Taittiriya Upanishad food has got a vast meaning. Food is not confined to what a living being consumes for mainatainance of its physical body. All that exists in the physical universe is food , like water, air ,fire etc and they are interdependent**.**

3.3.4 HATHA YOGA PRADIPIKA

We have seen in Bhagwadgeeta qualities of food which is good for maintainanace of health. Similarly Hathayoga pradipika also talks about food, balanced diet in detail .

In the first chapter many shlokas explain about the food, their effects ,what kind of food one shuold take and the food which is harmful for health.

Let us now understand the meaning of Sanskrit shlokas in Devanagari Script and their meaning in English.

अत्याहारः प्रयासश्च प्रजल्पो नियमाग्रहः।

जन-सङ्गश्च लौल्यं च षड्भिर्योगो विनश्यति॥ १५॥

atyāhāra□ prayāsaśca prajalpo niyamāgraha□ |

jana-sa□gaśca laulya□ ca □a□bhiryogo vinaśyati || 15||

Over eating, exertion,talkativeness,adhering to rules,company of people and unsteadiness destroy yoga.

When we eat more, the energy more drawn towards digestion from other systems in the body. The excretion of the toxins in the body suffers which badly affects Manomaya kosha , one loses alertness, physical health suffers this may lead to disturbances in the metabolism of the body.

To progress in yoga and to maintain good health one should avoid over eating,too much talking, constantly being in the company of people and wavering of mind.

हिंसा सत्यमस्तेयं ब्रह्मचर्यं क्षमा धृतिः।

दयार्जवं मिताहारः शौचं चैव यमा दश॥ १७॥

ahi□sā satyamasteya□ brahmacarya□ k□amā dh□ti□ |

dayārjava□ mitāhāra□ śauca□ caiva yamā daśa || 17||

Non Violence, truth,non stealing , continence, forgiveness, endurance, compassion, humility, moderate diet and cleanliness are the ten rules of conduct.

In the sloka it is mentioned that Mitahara or moderation of diet is one of the ten Yamas or rukles of conduct.

Mitahara means neither over eating nor undereating. For maintainance of good health one should not over eat or under eat. We have to fill the body sparingly . According to many commentaries on yoga texts one should eat upto half of the stomach, leaving ¼ space for movement of air and prana and another quarter for liquids. Diet should consist of fresh vegatables , fruits, sprouts. Overeating and craving for eating is due to unsteadiness of mind.

ब्रह्मचारी मिताहारी त्यागी योग-परायणः।

अब्दादूर्ध्वं भवेद्सिद्धो नात्र कार्या विचारणा॥ ५९॥

brahmacārī mitāhārī tyāgī yoga-parāya□a□ |

abdādūrdhva□ bhavedsiddho nātra kāryā vicāra□ā || 59||

An individual who is a brahmachari,takes moderate food, without any attachment, established in yoga becomes perfected in one year.

Brahmachari means, "one whose consciousness is absorbed in Brahma", the purest State of consciousness,not necessarily one who abstains from sexual interaction,So one who keeps his mind above existence of duality and sex,takes ageeable and sweet (mitahara) food,practices his sadhana regularly and maintains detachment from affairs of mundane life,will definitely achieve perfection within a short period of time.It is certainly no easy task as we have previously discussed, there are many trials and obstacles to face on the path to perfection.(Swami Muktibodhananda, 2001).

सुस्निग्ध-मधुराहारश्चतुर्थांश-विवर्जितः।

भुज्यते शिव-सम्प्रीत्यै मिताहारः स उच्यते॥ ६०॥

susnigdha-madhurāhāraścaturthā□śa-vivarjita□ |

bhujyate śiva-samprītyai mitāhāra□ sa ucyate || 60||

Mitahara is defined as agreeable and sweet food,leaving one fourth of the stomach free and eaten as an offering to please Shiva.

Sweet food here means nourishing and good tasting not that it should have extra sugar. Disageeable food means, the food which is bad tasting , toxic to the body and disturbs the metbolism of jthe body. Food should be fillled only upto half of the stomach leaving one quarter with water and another quarter for air.

While eating we should have the feeling that we are not eating for ourselves but for pleasing Shiva or the God which is essentially our inner consciousness.Everything one eats should be consideredas prasad or an offering from the God.If we cultivate this habit we can easily overcome the sense of ego.

When our mind is calm and quiet one can not over eat.Overeating is mainly due to agitation of mind. Food we jeat should be for maintainance of the body.

According to Swami Shivanand of Rishikesh,heavy food leads to a tamasic state and induces sleep olny. When we over eat large quanity of food is excreted undigested .Most of the diseases are due to irregularity of meals , overeating and unwholesome food.

कट्वाम्ल-तीक्ष्ण-लवणोष्ण-हरीत-शाक-

सौवीर-तैल-तिल-सर्षप-मद्य-मत्स्यान्।

आजादि-मांस-दधि-तक्र-कुलत्थकोल-

पिण्याक-हिङ्गु-लशुनाद्यमपथ्यमाहुः॥ ६१॥

ka□vāmla-tīk□□a-lava□o□□a-harīta-śāka-

sauvīra-taila-tila-sar□apa-madya-matsyān |

ājādi-mā□sa-dadhi-takra-kulatthakola-

pi□yāka-hi□gu-laśunādyamapathyamāhu□ || 61||

The food which are prohibited for yogis are those which are bitter, sour, pungent,salty,highly heated, green vegetables other than those recommended,sor gruel, oil, sesame and mustard , alcoholic, fish meat,curds, butter milk, horse gram,fruit of jujube, oil ,asafoetida and garlic.

Yogi should eat nourishing and balanced food.Bitter, sour and pungent food harms the digestive system.Meat,fish and eggs takes long time for digestion and creates toxins in the system. Moreover it stimulates violence nature and increases cholesterol in the body which are harmful for arteries and affects cardio vasccular system badly.

Garlic and onion stimulates sex glands.Alcohol is injurious to nervous system, destroys brain cells and liver is badly affected. Eating too much sugar products increase blood sugar and is harmful for diabetes patients.

भोजनमहितं विद्यात्पुनरस्योष्णी-कृतं रूक्षम्।

अतिलवणमम्ल-युक्तं कदशन-शाकोत्कं वर्ज्यम्॥ ६२॥

bhojanamahita□ vidyātpunarasyo□□ī-k□ta□ rūk□am |

atilava□amamla-yukta□ kadaśana-śākotka□ varjyam || 62||

Unhealthy diet should not be taken,that which is related after becoming cold, which is excessively salty or acidic , stale or has too many (mixed)vegetables.

In this sloka the author explains the importance of fresh food. We should always eat freshly prepared only. The reheated food is devoid of nutrients and may contain bacteria.If such food is taken it becomes fermented and cause acidity.Dry food devoid of natural oil and water is also not good for health. Excess salt and sour food also not good for body.

Though vegetables are good for health as it contains more vitamins, too many different type of veagetables should not be taken in a single meal, because each vegetable has a diferent combinations of minerals and othe nutrients.It will load the digestive syste m on account of unwanted chemical reactions.

Digestions should always be quick and smooth process which does not overstrain or overstrain or overheat the system and prana should not be wasted on digestion.

(Swami Muktibodhanand, 2001).

वह्नि-स्त्री-पथि-सेवानामादौ वर्जनमाचरेत्॥ ६३॥

तथा हि गोरक्ष-वचनम्

वर्जयेद्दुर्जन-प्रान्तं वह्नि-स्त्री-पथि-सेवनम्।

प्रातः-स्नानोपवासादि काय-क्लेश-विधिं तथा॥ ६४॥

vahni-strī-pathi-sevānāmādau varjanamācaret || 63||

tathā hi gorak□a-vacanam

varjayeddurjana-prānta□ vahni-strī-pathi-sevanam |

prāta□-snānopavāsādi kāya-kleśa-vidhi□ tathā || 64||

Fire,women and long privileges shoul be avoided.Threfore Gorakhnath said “Bad company, mixing with women,taking bath in the early morning, fasting and acts that produce pain in the body should be avoided.

गोधूम-शालि-यव-षाष्टिक-शोभनान्नं

क्षीराज्य-खण्ड-नवनीत-सिद्धा-मधूनि।

शुण्ठी-पटोल-कफलादिक-पञ्च-शाकं

मुद्गादि-दिव्यमुदकं च यमीन्द्र-पथ्यम्॥ ६५॥

godhūma-śāli-yava-□ā□□ika-śobhanānna□
k□īrājya-kha□□a-navanīta-siddhā-madhūni |
śu□□hī-pa□ola-kaphalādika-pañca-śāka□
mudgādi-divyamudaka□ ca yamīndra-pathyam || 65||

The most conducive foods for the yogi are good grains wheat,rice, barley, milk, ghee, brown sugar, sugar candy,honey,dry ginger,patola fruit (a kind of cucumber species,five vegatables,mung and pulses, and pure water.

पुष्टं सुमधुरं स्निग्धं गव्यं धातु-प्रपोषणम्।

मनोभिलषितं योग्यं योगी भोजनमाचरेत्॥ ६६॥

pu□□a□ sumadhura□ snigdha□ gavya□ dhātu-prapo□a□am |
manobhila□ita□ yogya□ yogī bhojanamācaret || 66||

The yogi should take nourishing and sweet food mixed with ghee and milk ,it should nourish the dhatus(basic body constituents)and be pleasing and suitable.

In this sloka the author of Hatha Yoga Pradipika, Gorakanath emphasises on taking food mixed with ghee and milk in a reasonable quanity. The food that we take should nourish dhatus. There are seven dhatus namely flesh, blood, skin , bone, marrow,fat and semen in males and ova in women.

The author also reiterates that food should be pleasing and suitable which means the food should should suit an individual's body constitution and mentality.It should make one feel healthy, mentally satisfied

3.3.5 GHERANDA SAMHITA

Gheranda Samhita is a Tantric work, treating of Hatha Yoga.It consists of adialogue between the sage Gheranda and an enquirer called Candakapali. A large number of verses of Gheranda Samhita are similar to Hatha Yoga Pradipika.

The book contains 7 chapters and about 350 Slokas or verses.In the 5th chapter we can find verses about food which a yoga practitioner ought to know for his progress in spiritual path and make one's physical body fit and make it diseasefree.

मिताहारं विना यस्तु योगारम्भं तु कारयेत्

नानारोगो भवेत्तस्य किन्चिद्योगो न सिध्यति॥ घे - सं - ५-१६॥

mitāhāra□ vinā yastu yogārambha□ tu kārayet
nānārogo bhavettasya kincidyogo na sidhyati || ghe - sa□ - 5-16||

He who begins the practice of yoga without controlling his diet suffers from many diseases and does not make progress in yoga.

शाल्यान्नं यवपिष्ठं वा गोधूमपिष्टकं तथा।

मुद्गमाषचणकादि शुभ्रं च तुषवर्जितम्॥ घे - सं - ५-१७॥

śālyānna□ yavapi□□ha□ vā godhūmapi□□aka□ tathā|
mudgamā□aca□akādi śubhra□ ca tu□avarjitam|| ghe - sa□ - 5-17||

Yogi shoulod eat food prepared from rice, flour or barley and wheat, green gram, black gram,horse gram, etc which should be clean,and free from husk.

पटोलं मनसं मानं कक्कोलं च शुकाशकम्।

द्राडिकां कर्कटीं रम्भां डुम्बरीं कण्टकण्टक॥ घे - सं - ५- १८॥

pa□ola□ manasa□ māna□ kakkola□ ca śukāśakam|

drā□ikā□ karka□ī□ rambhā□ □umbarī□ ka□□aka□□aka|| ghe - sa□ - 5- 18||

आमरम्भां भालरम्भां रम्भादण्डं च मूलकम्।

वार्ताकीं मूलकं रिंद्दिम्योगी भक्ष्णमाचरेत् ॥ घे - सं - ५-१९॥

āmarambhā□ bhālarambhā□ rambhāda□□a□ ca mūlakam|

vārtākī□ mūlaka□ rriddimyogī bhak□□amācaret| || ghe - sa□ - 5-19||

A yogi should eat patola, surana, mana, kakkola, sukasaka, drodhika, karkati, rambha Dumbari**,** kantakantaka, Amarambha, Balarambha, rambhadanda, mulaka, vartaki and riddhi

बालशाकं कालशाकं तथा पटोलपत्रकम्।

पञ्चशाकं प्रशंसीयाद्वास्तूकं हिलमोचिकाम्॥ घे - सं - ५-२०॥

bālaśāka□ kālaśāka□ tathā pa□olapatrakam|

pañacaśāka□ praśa□sīyāddāstūka□ hilamocikām|| ghe - sa□ - 5-20||

He may eat the five recommended leafy vegetables, balasaka, kalasaka, patolapatrakan, vastukaand himalosikan.

शुद्धं सुमधुरं स्निग्धं उदार्धविवर्जितम्।

भुज्यते सुरसं प्रीत्या मिताहारमिमं विदुः॥ घे - सं - ५-२१॥

śuddha□ sumadhura□ snigdha□ udārdhavivarjitam |

bhujyate surasa□ prītyā mitāhāramima□ vidu□ || ghe - sa□ - 5-21 ||

That kind of food is called as mitahaara or balanced diet which is pure,sweet lubricated and the food should be eaten only upto half the stomach and it should be palatable and is eaten to please the God .

अन्नेन पूरयेदर्धं तोयेन तु तृतीयकम्।

उदरस्य तुरीयांशं संरक्षेद्वायुचारणे॥ घे-सं 5.22 ॥

annena pūrayedardha□ toyena tu t□tīyakam |

udarasya turīyā□śa□ sa□rak□edvāyucāra□e || ghe-sa□- 5.22 ||

One should fill half the stomach with food, one quarter with water and the fourth quarter should be reserved for the movement of the air

कट्वाम्लं लवणं तिक्तं भूष्टं च दधि तक्रकम्।

शाकोत्कटं तथा मद्यं तालं च पनसं तथा॥ घे-सं - ५-२३॥

ka□vāmla□ lava□a□ tikta□ bhū□□a□ ca dadhi takrakam |

śākotka□a□ tathā madya□ tāla□ ca panasa□ tathā ||ghe-sa□ - 5-23 ||

One should avod bitter, sour, salt, pungent, scorched food, curds, buttermilk, liquor, palm nuts, jack fruits in the initial stages of yogic practices..

कुलत्तं मसुरं पाण्डुं कूष्माण्डं शाकदण्डकम्।

तुम्बिकोलकपित्तं च कण्टबिल्वं पलाशकम्॥ घे-सं - ५-२४॥

कदम्बं जम्बीरं बिम्बं लकुचं लशुनं विषम् ।

कामरङ्गपियालं च हिङ्गुशाल्मलिके मुकम्॥ घे-सं - ५-२५॥

योगारम्भे वर्जयेच्च पथस्त्रीवारिसेवनम्।

नवनीतं घृतं क्षीरं गुडं शर्करादि चैक्षवम्॥ घे-सं - ५-२६॥

kulatta□ masura□ pā□□u□ kū□mā□□a□ śākada□□akam |
tumbikolakapitta□ ca ka□□abilva□ palāśakam || ghe-sa□ - 5-24 ||
kadamba□ jambīra□ bimba□ lakuca□ laśuna□ vi□am |
kāmara□gapiyāla□ ca hi□guśālmalike mukam ||ghe-sa□ - 5-25 ||
yogārambhe varjayecca pathastrīvārisevanam |
navanīta□ gh□ta□ k□īra□ gu□a□ śarkarādi caik□avam || ghe-sa□ - 5-26||

The yogi is also supposed to avoid kulatha, masura, pandu, kushmanda, vegetable stems, gourds, berries, kapitta, kantabilva, palasaka, kadamba, jambira bimba, lakuca, lasuna, lotus stalk fibres, kamaranga, piyala, hingu, salmali, kemuka. Similarly he should avoid much travelling, company of women and basking near fire.

पक्करम्भां नारिकेलं दाडिम्बमशिवासवम्।

द्राक्षाङ्गुलवनीं धत्री रसमाम्लाववर्जितम्॥ घे-सं- ५-२७॥

एलाजातीलवङ्गं च पौरुषं जम्बू जाम्बलम्।

हरित्तार्किं खर्जूरं च योगी भक्षणमाचरेत्॥ घे-सं- ५-२८॥

लघुपाकं प्रियं स्निग्धं तथा धातुप्रपोषणम्।

मनोऽभिलाषितं योग्यं योगी भोजनमाचरेत्॥ घे-सं - ५-२९॥

pakkarambhā□ nārikela□ dā□imbamaśivāsavam |

drāk□ā□gulavanī□ dhatrī rasamāmlāvavarjitam ||ghe-sa□- 5-27||

elājātīlava□ga□ ca pauru□a□ jambū jāmbalam |

harittārki□ kharjūra□ ca yogī bhak□a□amācaret ||ghe-sa□- 5-28||

laghupāka□ priya□ snigdha□ tathā dhātuprapo□a□am |

mano'bhilā□ita□ yogya□ yogī bhojanamācaret ||ghe-sa□ - 5-29 ||

The practitioner of yoa is supposed to eat fresh butter, ghee, milk, sugar, sugarcane, jaggery, ripe plantain, coconut fruit, pome granateanise, grapes, lavali, dhatri (myrabolane), juice which is not sour, cardamom, nutmeg, cloves, paurusa, roseapple, jambala, haritaki, dates.

The food which is easily digestible, agreeable, soft and sticky which nourishes the elementary substances of the body and which is desirable and proper is an ideal one for yoga practitioners.

काठिन्यं दुरितं पूतिमुष्णं पर्युषितं तथा।

अतिशीतं चातिचोष्णं भक्ष्यं योगी विवर्जयेत्॥ घे-सं - ५-३०॥

प्रातःस्नानोपवासादि कायक्लेशःविधिं तथा।

एकाहारं निराहारं यामान्ते च न कारयेत्॥ घे-सं -५-३१॥

kā□hinya□ durita□ pūtimu□□a□ paryu□ita□ tathā |

atiśīta□ cātico□□a□ bhak□ya□ yogī vivarjayet ||ghe-sa□ - 5-30||

prāta□snānopavāsādi kāyakleśa□vidhi□ tathā |

ekāahāra□ nirāhāra□ yāmānte ca na kārayet ||ghe-sa□ -5-31 ||

A yogi should avoid food that is hard, polluted, putrid producing heat inside the body stale, extremely cold and extremely hot.

Yogi should avoid early morning bath, fasting etc or anything that causes fatigue. Similarly he should avoid eating once a day or not eating within three hours.

3.3.6 SHIVA SAMHITA

Shiva samhita is yet another yogic text .In the 3rd chapter slokas from 33 to 36 explain t in detail which food yoga practitioner should take in order to keep oneself to maintain physical and mental health and be free from all diseases.

आम्लं रुक्षं तथा तीक्ष्णं लवणं सार्षकं कटुम्।

बहुलं भ्रमणं प्रातः स्नानं तैलविदाहकम्॥

स्तेयं हिंसां जनद्वेषं चाहङ्कारमनार्जवम्।

उवपावासमसत्यं च मोक्षं च प्राणिपीडनम्॥

स्त्रीसङ्गमग्निसेवां च बह्वालापं प्रियाप्रियम्।

अतीव भोजनं योगी त्यजेदेतानि निश्चितम्॥ शि-सं - ३-३३॥

āmla□ ruk□a□ tathā tīk□□a□ lava□a□ sār□aka□ ka□um |

bahula□ bhrama□a□ prāta□ snāna□ tailavidāhakam ||

steya□ hi□sā□ janadve□a□ cāha□kāramanārjavam |

uvapāvāsamasatya□ ca mok□a□ ca prā□ipī□anam ||

strīsa□gamagnisevā□ ca bahvālāpa□ priyāpriyam |

atīva bhojana□ yogī tyajedetāni niścitam ||śi-sa□ - 3-33||

घृतं क्षीरं च मिष्टान्नं ताम्बूलं चूर्णवर्जितम्।

कर्पूरं निस्तुषं मिष्टं सुमठं सूक्ष्मरन्ध्रकम्॥

सिद्धान्तश्रवणं नित्यं वैराग्यगृहसेवनम्।

नामसङ्कीर्तनं विष्णोः सुनादश्रवणं परम्॥

धृतिः क्षमा तपः शौचं ह्रीर्मतिर्गुरुसेवनम्।

सदैतानि परं योगी नियमानि समाचरेत्॥ शि-सं-३-३५॥

अनिलेऽर्कप्रवेशे च भोक्तव्यं योगिभिः सदा।

वार्यौ प्रविष्टे शशिनि शयनं साधकोत्तमैः ॥ शि-सं-३-३६ ॥

gh□ta□ k□īra□ ca mi□□ānna□ tāmbūla□ cūr□avarjitam |

karpūra□ nistu□a□ mi□□a□ suma□ha□ sūk□marandhrakam ||

siddhāntaśrava□a□ nitya□ vairāgyag□hasevanam |

nāmasa□kīrtana□ vi□□o□ suanādaśrava□a□ param ||

dh□ti□ k□amā tapa□ śauca□ hrīrmatirgurusevanam |

sadaitāni para□ yogī niyamāni samācaret || śi-sa□-3-35||

anile'rkapraveśe ca bhoktavya□ yogibhi□ sadā |

vāryau pravri□□e śaśini śayana□ sādhakottamai□ ||śi-sa□-3-36||

The Yogi Should avoid the following things.

Acids 2.Astringents 3. Pungent substances 4. Salt 5. Mustard 6. Bitter things 7. Much walking 8. Early bathing 9. Things roasted in oils 10.Theft 11. Killing of animals 12.Enmity towards any person 13. Pride 14. Dupli city 15. Crookedness 16. Fasting 17. Un truth 18. Thoughts other than those of moksha 19. Cruelty towards animals 20. Companionship of women 21.worshipping of (or handling or sitting near) fire 22. Unpleasantness of speech 23.Much talking .

The yoga practitioner should observe certain things which are mentioned here below.

1. He should use clarified butter. 2 milk 3 sweet food 4 betel without lime. 5 camphor 6 Kind words. 7 monastery or retired cell 8 Hear discourses on truth,

9 Discharge duties with vairgya 10 Sing name of Vishnu 11 Sweet music 12 Have patience. 13 Constancy 14 Forgiveness 15 Austeritis 16 purifications 17 Modesty 18 Devotion 19 services of Guru.

When the air enters the sun it is the proper time for the yogi to take his food.(when the breath flows through the pingala). When the air enters the moon, he should go to sleep.(when the breath flows through the left nostril or the Ida).

3.3.7. THE CONCEPT OF AHARA FOR THE MANAGEMENT OF MADHUMEHA ACCORDING TO AYURVEDA.

Introduction

Ayurveda is the ancient medical system of India. Ayurveda in Sanskrit means Science of Life. It is a system of medicine that utilizes various therapies including diet , yoga and herbal preparations, to restore harmony and balance within the body.

The principles of Ayurveda are based on the concept of tridosha, or the system of three doshas. The three doshas, known as Vata, Pitta and Kapha, are dynamic forces with distinct characteristics that shape all things in the universe. Each person is born with a unique constitution, called *prakriti*, that is composed of varying amounts of influence from each of the three doshas.

In humans, the doshas control all mental, emotional, and physical functions and responses, and also determine the state of the soul. They produce natural urges and individual preferences in food. They govern the maintenance and destruction of bodily tissue and the elimination of waste products.In the Ayurvedic view, an imbalance between the doshas produces a condition called *vikriti*, a Sanskrit word that means "deviated from nature." Vikriti results from over expression of

One or two doshas which can be caused by wrong eating habits, chronic mental stress, excess physical work, negative emotions, insufficient sleep and these habits will eventually lead to

Diseases, obesity , or mental disorders. To prevent the diseases or restore health the doshas must be maintained in proper balance.

According to Ayurvedic principles, each individual's diet should be suited to his or her *prakriti*.

During times of *vikriti*, or imbalance, the diet can be used to either decrease or increase the three doshas until balance is restored. The dosha balancing effect of a food is determined by its taste, either salty, sour, sweet, bitter, astringent, or pungent and its other qualities, either heavy, oily, cold, hot, light, or dry .

Madhumeha in ayurvedic texts is equivalent to DM in modern medical science

There are various studies which have reported Madhumeha mentioned in ayurvedic texts may be considered as equivalent to Diabetes Mellitus. Mr A N Goswami has done a study on Madhumeha. And Mamta M has done a study on Madhumeha vis-à-vis Diabetes Mellitus . Both of them have concluded that Madhumeha can be considered to be equivalent to DM after comparing the clinical features, complications and etiology of Madhumeha with DM. In addition to this there are few more studies done in ayurvedic research have stated that Madhumeha as DM. Some of them are

01. 2002 V.J. Sukhadia - A clinico-comparative study of Śodhana (Virecana) purvak Śamana Cikitsā in the management of Madhumeha with special reference to Diabetes mellitus (K.C.)
02. 2007 Jasmin Viramagami – A clinical study of Pañca Swarasa Bhavita Shilājita in the management of Madhumeha w.s.r. to Diabetes Mellitus (K.C.)
03. 1966 A.N.Goswami- Madhumeha (Diabetes Mellitus) (K.C.)

According to Charaka Chikitsa madhumeha is basically one of the types of Prameha. The word Prameha consists two words- Pra (Upsarga-Prefix) and Meha.

प्रकृष्टो मेहः यस्मिन रोगेत स प्रमेहः ॥

prakṛṣṭo mehaḥ yasmina rogeta sa Pramehaḥ || (Ch.Su.17)

Meha is derived from the root 'Mih Sechane'meaning to purfuse (watering), Excessive quantity and frequency is indicated by the prefix (pra). That is why the main characteristic features of Prameha said to be prabhūta mūtratā (More urination) and avila mūtratā (Frequent urination).

Madhu + Meha = Madhumeha.

Madhumeha is a compound word made up of Madhu and Meha. So, Madhumeha is the disease in which the excretion is having quality similar to madhu in its colour, smell, taste & consistency.

Paribhāśā of Madhumeha: The clinical entity in which patient passes the urine similer with Madhu i.e. of Kaṣāya and Madhura taste, texture becomes Rūkṣa (dry) and body acquires sweetness called Madhumeha (Ch.Chi 6/55, A.H N.10)

Causes for Madhumeha;

According to Charaka Samhita, Sushruth Samhita and other ayurvedic texts Madhumeha can be caused by many factors, like Aharaja, Viharaja, Avyayama, Alasya, Genetic defects.

Aharaja (wrong food and /or wrong eating habits);
Eating heavy, oily, sticky cold foods, excessive sour and salty foods, excessive intake of sweet,food prepared from new grains, alcohol, over eating, taking milk products in large quantity, eating marshy fish,excessive intake of non veg food can lead to DM.

Viharaja
Sleeping in day time aggravates Kapha by causing inertia in the body which results in accumulation of prithvi and apa mahabhoota.

Avyayamaj.
Sedentary life style or lack of exercises results in accumulation of medas or fat and Kapha.

Laziness or alasya, day time sleeping and excessive indulgence in sex can result in Madhumeha

Therefore DM patients are supposrd to do regular exercises. Exercise reduces the Meda , helps to increase digestive power and maintain compactness in the body tissues and helps in combustion of fat.

In Charaka Chikitsa 6/18 and A. H. 12/5, 6) it has been mentioned about some food which are useful for DM patients.

The cūrna of haldi + madhu+ Juice of amla Or

Make kwatha of Daru haridra, devdāru, triphala, & water of motha.Or

Make kwātha of Chitrayamūla, triphala, daru haridra, & Indra jau.

- Roti of jau, Flour of jau mix with water and make bolus (Manda agni pāk) Cook in upala.i.e cow dung cake.
- Broken wheat -Roasted/ cooked with water.
- Truna dhānya, Shali dhānya.

- Vegetable of tikta rasa- karela (Bitter gourd), neem, patola, taroi, Lauki (bottle gourd)

Kaddu (Ash gourd) etc.

Summary.

Ayurveda mainly focuses on maintaining balance in the three doshas, Vata, Pitta, Kapha.

For maintaining good health,preventing diseases and for curing illness.

Regular exercise is needed for reducing excessive fat in the body.

Patients are advised to avoid the intake of food that contain excess salt, sour, sweet, dairy products, alcohol, food that is made of new grains.

They are advised to take fresh vegetables, fruits, sprouts. Bitter gourd, neem,louki Ash gourd etc

3.3.8. THE CONCEPT OF AHARA (DIET) FOR THE MANAGEMENT OF DIABETES ACCORDING TO NATUROPATHY.

Introduction:

Naturopathy is a way of life like yoga. It is considered to be an alternate therapy. It is holistic, preventive, curative drugless systems of health. It encourages the man to lead a life in tune with nature.

Naturopathy aims at eradicating the root cause of disease by making use of natural elements like air, water, soil, sun. It is considered to be a constructive method of treatment.

According to naturopathy disease is an abnormal condition of the body resulting from violation of natural laws. Whem we live against nature, human system is affected resulting in reduction in vitality and accumulation of waste and toxins.

The philosophy and practice of natural healing are based on 3 principles.

1. The accumulation of waste matter in the body is the root cause of all diseases. So to restore health we should enable the body to throw out the toxic accumulations.

2. The second principle of naturopathy is that all acute diseases such as fever, cold, inflammations, digestive disturbances and skin eruptions are produced by the body to get rid of accumulated toxins in the body.

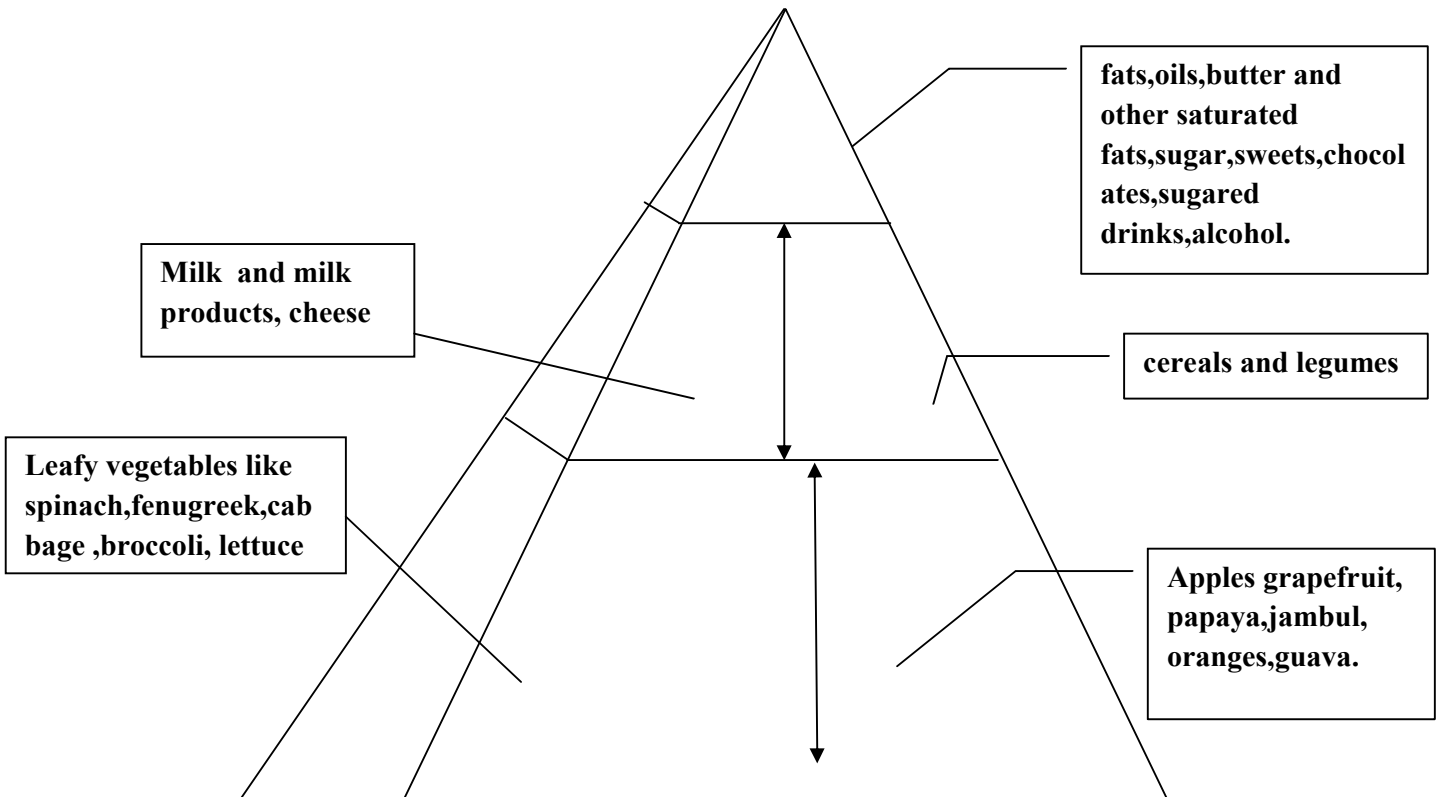
3. The power to heal is present in the body itself . We have to create the conducive atmosphere for the body to initiate healing process and cure the diseases .

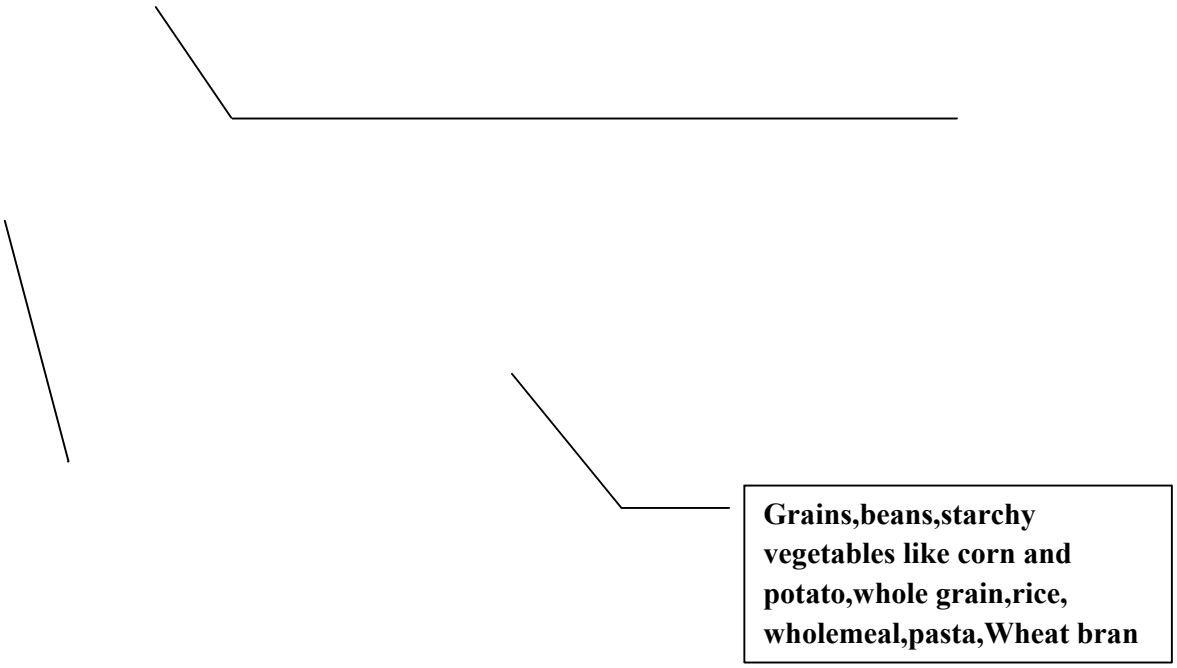
Diet is an essential part of diabetes treatment. Diabetics need more nourishing and better balanced diet than others. For successful management it is essential to understand the body's daily food and nutrition requirements and how to select foods which help in controlling and preventing diabetes.[3]

Health experts and nutritionists say that nutritious food and suitable eating habits are the key to good health , energy and vitality. Moreover diabetic patients are advised to maintain their weight in an ideal range. It improves secretion of insulin and its proper utilization.

The diabetes and food pyramid

The diabetic's food pyramid has 6 sections or food groups. They differ in size as shown in the picture.





- Adapted for natural management of the American Diabetes Association.

The food what we eat is broadly classified into

1 Carbohydrates 2 Proteins

3 Fibres 4 Fats

5 Vitamins 6 Minerals.

1 Carbohydrates

There are 2 types of carbohydrates , simple carbohydrates and complex carbohydrates. Simple carbohydrates are digested quickly and they increase blood sugar quickly. whereas

Complex carbohydrates are digested slowly and provide energy for a longer period of time and blood sugar level increases slowly. Therefore even though insulin in the body is low the body can manage complex carbohydrates and it will not affect the diabetics much.

Diabetic patients are advised to eat a combination of complex and simple carbohydrates.

Complex carbohydrates are found in starches like rice, cereals, pasta, beans, potatoes.

Simple carbohydrates are found in fruits, milk and milk products.

2 Proteins,

Proteins are needed for repairs of body tissues, maintenance and energy.

Diabetic patients are advised to take proteins which have low fat. Beans, peas, lentils, nuts and soya are rich in protein and low in fat. Meat, poultry, fish are rich in protein and fat.

3 **Fibres**

Fibre is present in outer layer of vegetables, seeds and fruits. It is a mixture of indigestible

Matter such as cellulose, lignin, pectin and gums. Diabetic patients are advised to take food that are rich in fibres.

Benefits of Fibrous food.

1. It decreases after meal blood glucose level.
2. It reduces the blood cholesterol level.
3. It improves ability of cells to receive and utilize insulin especially type2 diabetics.

4**.Fats**

Fats are rich source of energy.But medical experts recommend low intake if fats.

There are 2 categories of fat. 1. Saturated fats 2.Unsaturated fats

Saturated fats are found in ghee, butter, cheese, beef , mutton and pork. Saturated fats raise blood cholesterol levels, increases weight.

2.Unsaturated fats are found in oil.They remain liquid in room temperature. They are further divided into monounsaturated and polyunsaturated fats. Monounsaturated fats are Found in almond oil,camola,rapseed.Polyunsaturated fats are found in fish oil,corn and sunflower.

Diabetic patients are advised to substitute saturated fats with unsaturated fats.

5 **Vitamins**

Some vitamins lower blood sugar.

Vitamin A : Diabetic patients need supplements of vitamin A, since they are not able to convert beta carotene to vitamin A.

Vitamin of B group reduce blood fat and cholesterol. Diabetic patients lose vitamin B in urination. They should take vitamin B generously. Vitamin B1is considered to helpful inpreventing damage to the brain during diabetic acidosis. Vitamin B is found in

Whole grain cereals,pulses, nuts,peas,lime,legumes, banana ,apple, green vegetables,

Peanuts,rice bran , whole grain bread, milk, carrot.

Vitamin C : Dr George V Mann has recommended extra vitamin C for diabetics in his book Perspective in "Biology and Medicine.' Diabetics lose vitamin C in urination .

Vitamin C are found in amla or Indian gooseberry, citrus fruits, sprouted bengal gram and green gram.

Vitamin E : Vitamin E are found in fruits, green leafy vegetables, milk ,sprouts, sunflower oil, soya oil, alfalfa, lettuce.

Vitamin E decreases insulin requirements of diabetic patients.

6 Minerals.

Among minerals magnesium, chromium and manganese are found to be beneficial to diabetic patients.

Blood magnesium in diabetic patients is low.Magnesium is necessary to activate enzymes containing vitamin B6.

Magnesium is found in green leaves, alfalfa, soyabean, nuts, lemon,whole grains, brown rice and sunflower.

Chromium , According to Dr Richard A. Anderson, at the U.S. Department of Agriculture's Human Nutrition Research Centre in Beltsville, Maryland, whatever the blood sugar problem, chromium tends to normalize it. Dr Anderson believes that increased

Prevalence of diabetics is partly due to a deficiency of chromium in the diet. He cites some

14 studies done during the 1980s, showing that chromium improved glucose tolerance.[4]

Chromium has been found beneficial in treatment of diabetes. Columbia University scientists have reported in the American Journal of Clinical Nutrition establishing benefits of chromium for type2 diabetes. They have proved that chromium enhances insulin production in the body.

Chromium is found in bengal gram, kidney beans, soya bean, black gram, bottle gourd,

Pomegranate, pine apple, whole grain cereals.

Manganese. This is found in citrus fruits, nuts, grains, and green leafy vegetables. Manganese plays an important role in the production of natural insulin.

A planned diet programme containing required calorie is good for diabetics. According to Diabetic Self care Foundation of India the normal requirements of a diabetic patient is as follows.

1. 25 to 30 kilocalories per kg body weight.
2. 1 to 1.5 gram proteins per kg body weight.
3. 30 to 50 gram fat (unsaturated).
4. 200 to 300 gram starchy carbohydrates,
5. Fibres: Fruits, vegetables and cereals
6. Vitamins and minerals.

4.3.9 DIET FOR MANAGEMENT OF DIABETES MELLITUS TYPE 2 ACCORDING TO MODERN MEDICAL SCIENCE

Physical exercise, diet, leading a stress free life and maintenance of healthy weight are essential for the management diabetes mellitus type 2.

Diet of an organism is what it eats which is largely determined by the perceived palatability of foods. It is very important for the human beings to maintain a healthy diet. Nutrition or nourishment is the provision to cells and organisms of the materials necessary in the form of food to support life. Many common health problems can be prevented with a healthy diet.

Nutrition, : the study of nutrients in food, how the body uses nutrients, and the relationship between diet, health and disease Nutrition also focuses on how diseases, conditions and problems can be prevented or lessened with a healthy diet

Nutrition also involves identifying how certain diseases, conditions or problems may be caused by dietary factors, such as poor diet (malnutrition), food allergies, metabolic diseases, etc

Healthy diet is one which helps to maintain or improve general health. It is important for lowering many chronic health risks, such as obesity, heart diseases, diabetes, hypertension and cancer.[5] A healthy diet involves consuming appropriate amounts of all essential nutrients and an adequate amount of water. Nutrients can be obtained from many different foods, so there are numerous diets that may be considered healthy. A healthy diet needs to have a balance of fats, proteins, and carbohydrates, calories to support energy need and micro nutrients to meet the needs for human nutrition without inducing toxicity or excessive weight gain from consuming excessive amounts.

World Health Organization (WHO) makes the following 5 recommendations with respect to both populations and individuals:[2]

- Eat roughly the same amount of calories that your body is using. A healthy weight is a balance between energy consumed and energy that is 'burnt off'.
- Increase consumption of plant foods, particularly fruits, vegetables, legumes, whole grains and nuts.
- limit intake of fats, namely saturated fats and trans fats and replace with healthier unsaturated fats.
- Limit the intake of granulated sugar. A 2003 report recommends less than 10% simple sugars.[3]
- Limit salt / sodium consumption from all sources and ensure that salt is iodized.

Diabetes is a metabolic disorder. The patients suffering from diabetes need not follow a specific diet. They are required to observe certain guidelines of eating.

A nutrient is a source of nourishment, an ingredient in a food, carbohydrate,protein, fat, vitamin, minerals fiber and water. Macronutrients are nutrients which are needed in relatively large quantities. Micronutrients are nutrients which are needed in relatively small quantities.

A diabetes diet is simply a healthy eating plan that is high in nutrients, low in fat, and moderate in calories. It is a healthy diet for anyone diet is simply a A diabetes healthy eating

plan that is high in nutrients, low in fat, and moderate in calories. It is a healthy diet for anyone

Glucose and immunity:

Excessive intake of sugar reduces body`s ability to fight infections. In 1908 researchers noted that diabetes were more susceptible than non diabetics to infection. In 1942 researchers discovered that white blood cells of diabetics could not attack the bacteria in the body. There ia a misconception among the people that eating sugar leads to rapid increase in blood glucose than eating other types of carbohydrates like rice, bread etc. Researchers have now found that simple carbohydrates such as sugar and complex carbohydtraes such as bread and potato are digested in the same rate.

Diabetic patients are required to pay much attention to vitamins and minerals. An estimated 80 % of American adults need nutritional supplements primarily vitamins and minerals or micro nutrients. The inadequacies in the modern American diet is a contributing factor in a variety of

Diseases from atherosclerosis and diabetes to high blood pressure and stroke.

The daily meal should comprise of following constituents for better management of type 2

diabetes.

1 Carbohydrates .

2 Protein

3 Dietary fat

4 Micronutrients

The whole grains, vegetables and milk with low fat are rich in carbohydrates and they are good for diabetics. Carbohydrates and monounsaturated fat together should provide 60 -70% of energy intake. The metabolic profile of the patient should be taken into account while determining the monounsaturated fat content .

Glycemic Index.

Low glycemic index diet may reduce postprandial glycemia, the ability of individuals to maintain these diets long term and to achieve glycemic benefit has not been established.

Although it is clear that carbohydrates do have differing glycemic responses,the data does not reveal any clear trend in outcome benefits.

Proteins

It has been demonstrated that in people with diabetes type 2 the moderate hyperglycemia can contribute to an increased turnover of protein which suggests an increased need of protein. A number of studies in healthy subjects and in persons with controlled type 2 diabetes have demonstrated that glucose from ingested protein does not appear in the general circulation,

And therefore protein does not increase plasma glucose concentrations.

According to American Diabetes Association,the ingested protein does not increase plasma glucose concentrations in controlled type 2 diabetic patients although protein is a potent stimulant of insulin secretion like carbohydrates.

Fatty Acids

Saturated fat is the principal dietary determinant of plasma LDL cholesterol. Diabetic patients should limit intake of saturated fat and dietary cholesterol.Diets low in saturated fat and high in carbohydrate or monounsaturated fatty acids are reported to lower plasma LDL cholesterol equivalently provided energy intake and weight are held constant. Low saturated fat high carbohydrate diets increase postprandial levels of plasma glucose, insulin, triglycerides and in some studies, decrease plasma HDL cholesterol when compared in metabolic studies to isocaloric high monounsaturated fat diets .However, high monounsaturated fat diets have not been shown to improve fasting plasma glucose or HbA1c values.

Fibers:

Fiber consists mostly of carbohydrates. However because of its limited absorption by the body, not much of the sugars and starches get into the blood stream. Fiber is a crucial part of essential human nutrition.

The diabetic patients should eat the food that is rich in fibers. Vegetables, fruits and whole grains are very rich in fiber .To get good metabolic effect on glycemic control and plasma lipids type 2 diabetic patients are required to take large amount of fibers.

Water

About 70% of the non-fat mass of the human body is water. Nobody is completely sure how much water the human body needs - claims vary from between one to seven liters per day to avoid dehydration. The water requirements are very closely linked to body size, age, environmental temperatures, physical activity, different states of health, and dietary habits.The water requirements of each person differs since they are dependent on many factors.

Micronutrients

Minerals

Apart from carbon, hydrogen, oxygen and nitrogen human body needs other chemical elements called dietary minerals.Experts say that 16 key minerals are essential for human biochemical processes by serving structural and functional roles, as well as electrolytes . they include calcium,phosphorous,magnesium,iron, iodine etc.

Vitamins

Human body needs these vitamins in small quantity. These are organic compounds. Vitamins cannot be synthesized enough by the body. We have to get it from the food. Vitamins are classified as water soluble like vitamin B and C or fat soluble namely (A,D,E,K). several water soluble vitamins are manufactured are manufactured by bacteria.

Diabetic patients should take sufficient quantity of vitamins.

Some myths and facts about diabetes and diet.

MYTHS	FACTS
Diabetics should avoid sugar at all costs.	Dessserts need not be off limits as long as it is apart of healthy meal plan or combined with exercise.

A high protein diet is best.	Eating too much protein, animal protein cause insulin resistance. Human body needs protein, carbohydrates and fats in a balanced manner.
One has to cut way down carbohydrates.	Eating a balanced diet is the key. Focus on whole grain carbohydrates since they are rich in fibersand are digested slowly keeping blood sugar level more even.
Diabetics can no longer be able to eat normal food. They need special diabetic meals.	Expensive diabetic food generally offer no special benefit. Diabetics can eat with family and friends if they eat in moderation.

Diabetic patients have to limit highly refined carbohydrates like white bread, pasta, and rice, as well as soda, candy, and snack foods. Focus instead on high-fiber complex carbohydrates—also known as slow-release carbohydrates. Slow-release carbohydrates help keep blood sugar levels even because they are digested more slowly, thus preventing the body from producing too much insulin. They also provide lasting energy and help in retaining for a longer period.

The glycemic index (GI) indicates how quickly a food turns into sugar in our system. Glycemic load, a newer term, looks at both the glycemic index and the amount of carbohydrate in a food, giving us a more accurate idea of how a food affects blood sugar level. High GI foods spike the blood sugar rapidly, while low GI foods have the least effect.

High glycemic index food	Moderate glycemic index food,	Low glycemic index food
White foods (white rice,white pasta,white bread, Potatoes and baked goods.sweets, chips and many processed foods.	All vegetables, and most type of fruit,	Nuts and seeds, lean meats, Sea food, whole grains and beans, brown rice, whole wheat bread and whole

		wheat pasta.

Indian diet for type 2 Diabetes

Let us now look into the suitable diet for Indians suffering from type 2 diabetes in the light of suggestions made by The Indian Council of Medical Research and other eminent experts.

Carbohydrates;

According to Metha and Vali, authors of the book, "Speaking of Diabetes and Diet: A Valuable Survival Guide for the Newly Diagnosed Diabetic," the diabetic should consume 65 to 75 percent of daily calories in complex carbohydrates. This will ensure that blood sugar levels remain regulated. Complex carbohydrate consumption helps minimize blood cholesterol triglycerides and also improves digestive processes. Food sources for the diabetic include legumes, rice and whole wheat bread.

Proteins

The diabetic experts recommend that 25 percent of daily calories come from protein. Leafy green vegetables, soya bean cheese, chicken, are the major source of protein. Excessive protein can harm the liver and kidneys.

Chana

Chana is rich in fibers and it lowers blood sugar level. It is a legume and commonly used in Indian diet.It reduces fasting blood sugar levels by thwarting the passage of sugars into the urine which reduces one’s insulin requirements.

Fiber

Fibers play an important role in the diabetic diet. The Indian council of medical research recommends a daily intake of 25 to35 grams of fiber. Fiber helps to naturally reduce glucose levels.

Foods which are rich in fibers are

- Cereal
- Fresh fruit
- Raw vegetables

- Red beans
- Drumstick stems
- Lotus stems
- Curry leaves
- Pomegranate
- Coriander
- Cardamom seeds.
- Red beans
- Bean sprouts.
- Whole grains

Cholesterol

The diabetic patients should lower cholesterol intake. A maximum of 300 milligrams of cholesterol can be eaten. They should avoid fried food.Instead of whole milk skimmed milk can be used.

PART II

VALIDATING INTEGRATED YOGIC MODULE IN TYPE 2 DIABETES MELLITUS.

CONTENTS

CHAPTER-1

1.1 INTRODUCTION

DIABETES MELLITUS TYPE2

Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The effects of diabetes mellitus include long-term damage, dysfunction and failure of various organs. [6]Type 2 includes the common major form of diabetes mellitus which results from defect(s) in insulin secretion, almost always with a major contribution from insulin resistance. [1]

The classical symptoms of diabetes are polyuria, polydipsia and polyphagia[7] . Diabetes without proper treatments can cause many complications. Acute complications include

hypoglycaemia, diabetic ketoacidosis, or nonketotic hyperosmolar coma. Serious long-term complications include cardiovascular disease, chronic renal failure, and retinal damage. Adequate treatment of diabetes is thus important, as well as blood pressure control and lifestyle factors such as smoking cessation and maintaining a healthy body weight[8]. Type 2 diabetes is attributed primarily to lifestyle factors and genetics. [9]

Diabetes is pandemic in both developed and developing countries. In 2000, there were an estimated 175 million people with diabetes worldwide and by 2030, the projected estimate of diabetes is 354 million.[10] The greatest relative rise is predicted in the developing countries of the Middle Eastern Crescent, Subsaharan Africa and the Indian subcontinent. By the year 2030, over 85 percent of the world's diabetic patients will be in developing countries. In India alone, the prevalence of diabetes is expected to increase from 31.7 million in 2000 to 79.4 million in 2030. Since the incidence of obesity is rising at an alarming rate in developed and developing countries, the projections for the number of diabetics could well be a gross underestimation.

A developing country like India faces the paradox of families, in which the children are underweight and the adults are overweight. This combination has been attributed by some people to intrauterine growth retardation resulting in low birth weight, which apparently confers a predisposition to obesity later in life through the acquisition of a "thrifty" phenotype that, when accompanied by rapid childhood weight gain, is conducive to the development of insulin resistance and metabolic syndrome [11]. A national survey of diabetes conducted in six major cities in India in the year 2000 has shown that the prevalence of diabetes in urban Indian adults was 12.1%.[12] The onset of diabetes among Indians is about a decade earlier than their western counterparts and this has been noted in Asian Indians in several studies[13]. In the national survey 54.1% of diabetics developed it in the most productive years of their lives i.e. before the age of 50 years and they also had a higher risk of developing chronic complications of diabetes.[14] The prevalence of Type 2 diabetes is 4-6 times higher in the urban areas as compared to rural areas. The prevalence of impaired glucose tolerance (IGT) in the rural population is also high at 7-8%, which indicates presence of a genetic basis for Type 2 diabetes in ethnic Indian population.[15] (Assuming that age-specific prevalence remains constant, the number of people with diabetes in the world is expected to approximately double between2000 and 2030, based solely upon demographic changes. The greatest absolute increase in the number of people with diabetes will be in

India. Most of the expected population growth between 2000 and 2030 will be concentrated in the urban areas of the world. The most striking demographic change in global terms will be the increase in the proportion of the population < 65 years of age.

In developing countries, the majority of people with diabetes are in the 45 to 64 year age range, similar to the finding reported previously.[16] In contrast, the majority of people with diabetes in developed countries are < 64 years of age. By 2030, it is estimated that the number of people with diabetes < 64 years of age will be > 82 million in developing countries and > 48 million in developed countries[17]

In CAM treatments human is considered as a whole and each human is treated differently for the same disease. The disease alone is not considered, but also the causes – physical and mental (psychological) reasons.[18]

A study[19] was conducted with 255 patients enrolled in a comprehensive diabetes program that emphasized physical training. A low maximal oxygen uptake (VO_2 max) was found in patients with non-insulin-dependent diabetes mellitus compared with sedentary control subjects. Regular exercises were associated with a modest decrease in resting and exercise blood pressure. Glycosylated haemoglobin levels and plasma triglycerides improved only in patients with non-insulin-dependent diabetes mellitus. Insulin requirements were significantly reduced in patients with insulin-dependent diabetes mellitus. A combination of low-impact endurance and resistance type exercise training is preferred for long-standing insulin-treated type 2 diabetic patients, as it provides a relatively low cardiovascular challenge and improves functional performance. Yoga asanas may be used as an adjunct with diet and drugs in the management of Type 2 diabetes skeletal muscle may be a key component mediating salutary effects of lifestyle interventions on hyperglycaemia and insulin resistance.[20]

Intensive short-term lifestyle modifications can restore mitochondrial content and functional capacity in skeletal muscle in type 2 diabetic patients.[21]

A central feature of most successful lifestyle intervention studies was high patient adherence to lifestyle recommendations. Patients with diabetes vary in their adherence to different self-management tasks. Adherence to one task (e.g. diet) is a poor predictor of adherence to others (e.g. glucose monitoring).[22] Several studies have documented the role of psychosocial factors in the course of diabetes. For example, the high prevalence rate (15 to 20 percent) of depression in persons with diabetes is associated with fewer adherences to self-care

behaviours and decreased glycaemic control.[23] Recent intervention study results show that treatment with antidepressants or behaviour therapy improves depression and glycaemic control.[24] Psychological, emotional, related behavioural factors, and quality of life are important in diabetes management, are worthy of attention in their own right, and influence metabolic control. A range of interventions that achieve benefits in these areas provide a base for developing versatile programs to promote healthy coping.[25]

A study demonstrated a significant reduction in fasting and post-prandial glucose levels, insulin glucose ratio, and reduction in oral glycaemia agents and insulin requirements after yoga breathing practices called Pranayama.[26] Another study on yoga therapy for NIDDM concluded that the yoga group improved significantly in their fasting glucose levels as well as HbA1 levels[27] Few subjects even reduced their tablets after practice of yoga over a period of 12 weeks. There was a significant reduction in hyperglycaemia and area index total (AIT) with decrease in oral hypoglycaemic drugs required for maintenance of normoglycemia.[28] Twenty Type 2 diabetic subjects between the age group of 30-60 years practiced 40 days of yogasanas (30-40 minutes every day) and the results showed beneficial effect on glycemic control and nerve function in mild to moderate Type 2 diabetes with sub-clinical Neuropathy.[29] In another study on the role of yoga in modifying certain cardiovascular functions in type 2 diabetes patients, subjects showed better glycemic control and stable autonomic functions. A 10 day (pre and post design) study has shown the impact of a brief [30]lifestyle intervention based on yoga on some of the biochemical indicators of risk for cardiovascular disease and diabetes mellitus at Integral Health Clinic (IHC) an outpatient facility which conducts 8-day lifestyle modification programs based on yoga for prevention and management of chronic disease with an intervention of asanas (postures), pranayama (breathing exercises), relaxation techniques, group support, individualized advice, lectures and films on the philosophy of yoga and the place of yoga in daily life, meditation, stress management, nutrition, and knowledge about the illness. As a result, fasting plasma glucose, serum total cholesterol, low-density lipoprotein (LDL) cholesterol, very LDL cholesterol, the ratio of total cholesterol to high density lipoprotein (HDL) cholesterol, and total triglycerides were significantly lower, and HDL cholesterol significantly higher, on the last day of the course compared to the first day of the course. The changes were more marked in subjects with hyperglycaemia or hypercholesterolemia; observations suggested that a short lifestyle modification and stress management education program lead to favourable metabolic effects within a period of 9 days.[31]

In another study, twenty NIDDM subjects (mild to moderate diabetes) in the age group of 30-60 years were, from the outpatient clinic of a hospital for a 40 days yoga asana for patients with type 2 Diabetes which included, *Suryanamaskaras, Trikonasana, Tadasana, Sukhasana, Padmasana, Bhastrika Pranayama, Paschimottanasana, Ardhmatsyendrasana, Pawanmuktasana, Bhujangasana, Vajrasana, Dhanurasana* and *Shavasana*. Results indicated that there was significant decrease in fasting glucose levels and postprandial blood glucose levels. The exact mechanism as to how these postures and controlled breathing interact with somato-endocrine mechanism affecting insulin kinetics was worked out. A significant decrease in waist-hip ratio and changes in insulin levels were also observed, suggesting a positive effect of *yoga asanas* on glucose utilization and fat redistribution in NIDDM. *Yoga asanas* may be used as an adjunct with diet and drugs in the management of Type 2 diabetes.[15]

Having given these evidences for the role of yoga in management of Diabetes Mellitus, it is essential to have a standard yoga therapy protocol for the same. The present study is designed to have a standard yoga protocol for the management of Diabetes Mellitus.

1.2 LITERATURE SURVEY

Diabetes mellitus is a metabolic disorder in the endocrine system. There are lots of chemical agents available to control and to treat diabetic patients, but total recovery from diabetes has not been reported upto this date. In addition to adverse effects, drug treatment are not always sasisfactory in maintaining euglycemia and avoiding late stage diabetic complications.Other alternative therapies such as dietary supplements, acupuncture, hydro therapy and yoga therapies is less likely to have side effects of conventional approaches for diabetes.[32]

In type 2 diabetes the pancreas of the patients either produce insufficient insulin or the insulin produced does not match the requirement of the body,or the cells of the body are unable to use it properly. A number of studies on yoga has shown that yoga has many beneficial effects for diabetes.

Let us now review some of the important studies undertaken on the effect of yoga on diabetic patients and the outcome of those studies.

It is now recognised that diabetes mellitus is a life style and psychosomatic disorders in which factors such as sedentary habits and physical,emotional and mental stress play a major

role.Modern research has focussed on psycho-physiological beneficial effects of yoga as it is more than mere physical exercise.[33] [34] [35] [36] [37] It has been reported that even a short life style modification and stress management education program based on yoga reduces risk factors for cardio vascular disease and DM within 9 days.[38]

Yoga has been increasing popular as a means of exercise and training fitness.[39] The aim of all yogic practices is to provide very deep rest to each and every cell including the beta cells in pancreas that produce insulin. Physical practices are one of the important tools of yoga to achieve samatvam of mind.

Yoga module consists of

1 Loosening exercises 2 Breathing exercises 3 Asanas 4 Pranayama

5 Meditation 6 Relaxation techniques 7 Kriyas

A growing number of research studies have shown that hath yoga can improve strength and

flexibility and may help to control physiological variables such as blood pressure, respiration and heart rate and metabolic rate.(Tran,et.al.,2001).[40] Yoga also emphasises on Sattvik diet. In a study dietary

restrictions to 1100kcals per day for 28 days,there was decline in the fasting glucose levels of obese diabetic subjects and insulin sensitivity was significantly improved which is likely the result of decreased hepatic glucose output.For people with type 2diabetes,carbohydrate and monounsaturated fat should comprise 60-70% of total calories.(Michael J,2007).[41] Yoga postures are slow rhythmic movements whichemphasise the stimulation of the organs and glands by easy bending and extentions which do not over stimulate muscles but concentrate on glandular stimulation.(Nayak,et.al., 2004).[42] Physical practices such as clensing techniques(kriyas),loosening practices (Sithilikarana Vyayama),surya namaskar (sun salutation) andyogasanas provide mild intensity physical exercise effect.(Rai, L.1994).[43]

Studies conducted by Malhotra and others showed beneficial effect on glycemic control and nerve function `In mild to moderate type 2diabetes with subclinical Neuropathy. (Malhotra,et.,al,2002).[44] In another study on role of yoga in modifying certain cardiovascular functions in type 2 diabetes patients showed better glycemic control and stable autonomic functions.(Singh,2004).[45]

Long term yoga practice is associated with increased insulin sensitivity and attenuation of negative relationship between body weight or waist circumference and insulin sensitivity.[46]

A comprehensive review by Innes and Vincent http://www.ijoy.org.in/article.asp?issn=0973-6131;year=2012;volume=5;issue=1;spage=10;epage=15;aulast=Madanmohan, - ref4 found beneficial changes in several risk indices, including glucose tolerance, insulin sensitivity, lipid profile, anthropometric characteristics, blood pressure, oxidative stress, coagulation profiles, sympathetic activation and pulmonary function, as well as improvement in specific clinical outcomes. They suggested that yoga may improve risk profiles in adults with non insulin dependent (NIDDM) and may have promise for the prevention and management of cardiovascular complications in this population.[47]

In a study conducted by Kyizom on the effect of pranayama and yoga asana on cognitive brain functions in type 2 diabetes it was found that yoga has a beneficial effect on p300 and thus can be incorporated along with the conventional medical therapy for improving cognitive brain functions in diabetes.[48]

Table of Practices

The list of practices recommended in yoga scriptures with supporting scientific studies are as

Table -1, List of the practices advised for Diabetes mellitus type2 with references

LITERATURE SURVEY TABLE

	PRACTICES	EXPERIMENTAL/ JOURNAL REF	CLASSICAL REF/BOOK REF
1	BREATHING PRACTICES		
1.1	Hands stretch breathing		(R.Nagarathna.,2012.,et,al.)[49]
1.2	Hands in and out breathing		(R.Nagarathna.,2012.,et,al.)[50]
1.3	Ankles stretch breathing		(R.Nagarathna.,2012.,et,al.)[51]
1.4	Tiger breathing		(R.Nagarathna.,2012.,et,al.)[52]
1.5	Rabbit breathing		(R.Nagarathna.,2012.,et,al.)[53]
1.6	Sasanksana breathing		(R.Nagarathna.,2012.,et,al.)[54]
1.7	Straight leg raise breathing		(R.Nagarathna.,2012.,et,al.)[55]
1.8	Instant relaxation technique		(Dr R.Nagarathna.,2012.,et,al.)[56]

2	Loosening exercises		
2.1	Forward and backward bending		(Dr R.Nagarathna.,2012.,et,al.)[57]
2.2	Side bending		(Dr R.Nagarathna.,2012.,et,al.)[58]
2.3	Twisting leg apart		(Dr R.Nagarathna.,2012.,et,al.)[59]
2.4	Butterfly loosening		(Dr R.Nagarathna.,2012.,et,al.)
2.5	Wind releasing pose exercise		(Dr R.Nagarathna.,2012.,et,al.)[60]
2.6	Plough pose to forward bending exercise		(Dr R.Nagarathna.,2012.,et,al.)
2.7	Jogging		(Dr R.Nagarathna.,2012.,et,al.)[61]
3.0	Surya namaskar		(Dr R.Nagarathna.,2012.,et,al.)[62]
3.1	Quick relaxation technique		(Dr R.Nagarathna.,2012.,et,al.)[63]
4	ASANAS		
4.1	STANDING POSTURE		
4.1.1	TRIKONASANA	(Malhotra V,Singh, 2005, et,al.)[64]	
	DO	(Shreelaxmi V Hegde, et,al.,)[65]	
	DO		
4.1.2	PARSVA KONASANA	(Shreelaxmi V Hegde, et,al.,)	
4.1.3	PRASARITA PADOTTANASANA	(Shreelaxmi V Hegde, et,al.,)	
4.1.4	PADAHASTASANA	(Shreelaxmi V Hegde, et,al.,)	(Dr R.Nagarathna.,2012.,et,al.)[66]
4.1.5	VRIKSHASANA	(Shreelaxmi V Hegde, et,al.,)	
4.1.6	PARSHVOTTANASANA	(Shreelaxmi V Hegde, et,al.,)	
4.1.7	PRRIVRITTA TRIKONASANA		(Dr R.Nagarathna.,2012.,et,al.)[67]
4.1.8	Ardhakaticakrsana		(Dr R.Nagarathna.,2012.,et,al.)[68]
4.2	SUPINE POSTURES		
4.2.1	VIPARITA KARANI	(Shreelaxmi V Hegde, et,al.,)	(Dr R.Nagarathna.,2012.,et,al.)[69]

4.2.2	SARVANGASANA		(Dr R.Nagarathna.,2012.,et,al.)[70] (Swami Satyananda Saraswati,1995)[71]
4.2.3	SETUBANDASANA	(Manjunath S,Vempatti, et, al)	
4.2.4	UTTANAPADASANA	(Shreelaxmi V Hegde, et,al.,)	
4.2.5	PAVANAMUKTASANA	(Manjunath S,Vempatti, et, al)	
	‘	(Shreelaxmi V Hegde, et,al.,)	
4.2.6	HALASANA	(Manjunath S,Vempatti. et, al.,)	(Swami Satyananda Saraswati,1995)[72]
4.3	SITTING POSTURES		
4.3.1	SUKASANA	(MalhotraV,Singh,2005, et,al.)[73]	
4.3.2	GOMUKASANA	(Shreelaxmi V Hegde, et,al.,)	(Swami Satyananda Saraswati,1995)[74]
4.3.3	PADMASANA	(Malhotra V Singh)[25]	
4.3.4	KURMASANA		
4.3.5	ARDHAMATSYENDRASNA	(Malhotra V Singh)[25]	(Dr R.Nagarathna.,2012.,et,al.)[75]
4.3.6	PASCHIMOTTANASANA		(Swami Satyananda Saraswati,1995)[76]
	DO	(Malhotra V Singh)[25]	
	DO	(Shreelaxmi V Hegde, et,al.,)	
4.3.7	VAJRASANA	(Shreelaxmi V Hegde, et,al.,)	
	DO		
4.3.8	VAKRASANA	(Shreelaxmi V Hegde, et,al.,)	(Dr R.Nagarathna.,2012.,et,al.)[77]
	DO		
4.3.9	USTRASANA		(Dr R.Nagarathna.,2012.,et,al.)[78]
4.3.10	MATSYASANA		(Dr R.Nagarathna.,2012.,et,al.)[79]
4.4	PRONE		

4.4.1	BHUJANGASANA	(Shreelaxmi V Hegde, et,al.,)	(R.Nagarathna.,2012.,et,al.)[80] (Swami Satyananda Saraswati,1995)[81]
		(Manjunath S,Vempatti. et al,)[82]	
		(Malhotra V Singh)[25]	
4.4.2	SALABHASANA	(Shreelaxmi V Hegde, et,al.,)	(Swami Satyananda Saraswati,1995)[83]
4.4.3	DHANURASANA	(Shreelaxmi V Hegde, et,al.,)	(Dr R.Nagarathna.,2012.,et,al.)[84] (Swami Satyananda Saraswati,1995)[85]
		(Manjunath S,Vempatti. et al,)[86]	
		(Malhotra V Sing)[25]	
4.4.4	RAJKAPOTASANA EKPADA		
4.4.5	Hamsasana		(Dr R.Nagarathna.2012.,et,al.)[87]
4.4.6	Mayurasana		(Dr R.Nagarathna.,2012.,et,al.)[88]
4.4.7	SAVASANA/DRT/ YOGANIDRA		
5.0	PRANAYAMA	(Kyizom T,Singh .et,al.,)	
5.1	VIBHAGIYA PRANAYAMA		
5.2	NADI SUDDHI		(Swami Satyananda Saraswati,1995)
		(Shreelaxmi V Hegde, et,al.,)	
5.3	SITALI	(Shreelaxmi V Hegde, et,al.,)	(Dr R.Nagarathna.,2012.,et,al.)[89]
5.4	SITKARI	(Shreelaxmi V Hegde, et,al.,)	(Dr R.Nagarathna.,2012.,et,al.)[90]
5.5	SADANTA		(Dr R.Nagarathna.,2012.,et,al.)[91]
5,6	BHASTRIKA	(Malhotra V Singh)[25]	(Swami Satyananda

			Saraswati,1995)
5.7	Bhramari		(Swami Satyananda Saraswati,1995)
5.8	Ujjayi		(Swami Satyananda Saraswati,1995)
6.0	Nadanusandhana		(Dr R.Nagarathna.,2012.,et,al.)[92]
	Om meditation		(Dr R.Nagarathna.,2012.,et,al.)[93]
7.0	Kriyas		
7.1	Jalaneti		(Dr R.Nagarathna.,2012.,et,al.)[94]
7.2	Sutraneti		(Dr R.Nagarathna.,2012.,et,al.)[95]
7.3	Vamanadhouti		(Dr R.Nagarathna.,2012.,et,al.)[96]
7.4	Sankhaprakshalana		(Dr R.Nagarathna.,2012.,et,al.)[97]
7.5	Agnisara		(Dr R.Nagarathna.,2012.,et,al.)[98]

2. AIM AND OBJECTIVES

2.1 AIM

Validation of yoga therapy module for diabetes mellitus type2 .

2.2 OBJECTIVES

1. To define the proper yogic tools which will be helpful for DM 2

2. To get the classical support for all the practices suggested for DM 2

2.3 RESEARCH QUESTIONS

Are series of yogic postures, breathing, meditation, relaxation and cleansing techniques supporting the view of various yoga researchers, practitioners, clinicians for management of DM2 ?

2.4 HYPOTHESIS

H_1: The yoga module is good for DM 2

H_2: The yoga module is not proper for DM 2

H_0: The yoga module is invalid for DM 2

3. METHODS

3.1 EXPERTS

The experts were chosen from among doctorates in yoga, medical doctors with knowledge of yoga therapy, yoga therapists with a minimum 5 years experience and yoga instructors with more than 7 years of experience.

A total of 30 experts or panelists from different parts of Karnataka were asked to participate in content validity.

3.1.1 Inclusion Criteria.

1. All classical texts of yoga and research theses which has the descriptions of diabetes were included.
2. To check the content validity, Yoga academic staff of teaching institutions with a

3.1.2 Exclusion Criteria.

a. For experts.

1 Experts without knowledge of yoga therapy were excluded.

2 Yoga therapists with less than 5 years of experience were excluded.

b. For patients.

1 The yoga module cannot be applied for patients with type 1 diabetes.

2 Diabetics with complications like CAD, renal disease, proliferative retinopathy cannot undergo this treatment protocol.

3.1.3. Source of literature for developing the protocol.

1. The classical texts of yoga including all Vedas, text books, and commentaries were referred from Saraswati library, SVYASA University.
2. The yoga research studies were available in Pub Med, Google scholar etc.
3. MSc, PhD theses were made available through from Saraswati library, SVYASA University.

3.2 DESIGN

Different *ācāryas* in yoga talk about different ways for the treatment for type2 diabetes mellitus. At the same time text books available from schools of yoga also contemplate on few pose which can be excusively advocated for DM2. Therefore, to develop an overall protocol, we followed the following steps-

Step-1: Exhaustive literary search from the text books and research paper/theses available in yoga was done for DIABETES MELLITUS..

Step-2: The compiled literature has been put together in a tabular form to get the common and unique features described in each text. Then, the studies done on different practices and published in journal as a scientific background were extracted. This gave a scientific back up to the literary search.

Step-3: A minute wise treatment protocol is developed in the form of tailor made practise which is supported by classical texts and research evidence.

Step-4 (Validation by experts): This complete module will be presented for validation in front of yoga experts with clinical experience (≥5years). These experts will be requested to participate for evaluating the content validity for the proposed instrument on a three point scale.

4. DATA ANALYSIS

A matrix of the validated results by experts will be prepared. Data will be analyzed by using software 'R' and the statistical test Lawshe's Content Validity Ratio (CVR) will be used to check the content validity.

Each expert will be asked to rate the content validity of each domain on a three point scale: "Essential", "Useful but not essential", "Not necessary". The content validity will be then calculated using the method of Lawshe (1975). If E denotes the number of experts marking a domain as essential and N the total number of experts, then Lawshe' s CVR is defined as the ratio of (E – N/2) and N/2. The critical values for this CVR statistic are given in Lawshe (1975).

4.1 CONTENT VALIDITY

In psychometrics, **content validity** (also known as **logical validity**) refers to the extent to which a measure represents all facets of a given social construct. For example, a depression scale may lack content validity if it only assesses the affective dimension of depression but fails to take into account the behavioral dimension. An element of subjectivity exists in relation to determining content validity, which requires a degree of agreement about what a particular personality trait such as extraversion represents. A disagreement about a personality trait will prevent the gain of a high content validity.

One widely used method of measuring content validity was developed by C. H. Lawshe. It is essentially a method for gauging agreement among raters or judges regarding how essential a particular item is. Lawshe (1975) proposed that each of the subject matter expert raters (SMEs) on the judging panel respond to the following question for each item: "Is the skill or knowledge measured by this item 'essential,' 'useful, but not essential,' or 'not necessary' to the performance of the construct?" According to Lawshe, if more than half the panelists indicate that an item is essential, that item has at least some content validity. Greater levels of content validity exist as larger numbers of panelists agree that a particular item is essential. Using these assumptions, Lawshe developed a formula termed the content validity ratio: CVR = (n < sub > e < / sub > − N / 2) / (N / 2) where CVR= content validity ratio, n_e= number of SME panelists indicating "essential", N= total number of SME panelists. This formula yields values which range from +1 to -1; positive values indicate that at least half the

SMEs rated the item as essential. The mean CVR across items may be used as an indicator of overall test content validity. The minimum values of the CVR can be found in the following table:

Table-2 Minimum Values of CVR

Number of Panelists	Minimum Value
5	0.99
6	0.99
7	0.99
8	0.75
9	0.78
10	0.62
11	0.59
12	0.56
13	0.54
14	0.51
15	0.49
20	0.42
25	0.37
30	0.33
35	0.31
40	0.29

Practices with their respective CVR

$$CVR=\{\frac{Ne-N/2}{N/2}$$

Ne= total no of Essentials for each practice

N= total no of panelists.

Breathing exercises	Ne	N	N/2	Ne-N/2	(Ne-N/2)/N/2
Hands in and out breathing	16	30	15	1	0.07
Hands stretch breathing	21	30	15	6	0.40
St leg raising	16	30	15	1	0.07
Rabbit breathing	15	30	15	0	0.00
Instant relaxation technique	19	30	15	4	0.27
Loosening exercises forward and backward	23	30	15	8	0.53
Side bending	28	30	15	13	0.87
Twisting leg apart exercise	23	30	15	8	0.53
Butterfly loosening	13	30	15	-2	-0.13
Wind releasing pose exercise	27	30	15	12	0.80
Plough pose to forward bend exercise	16	30	15	1	0.07
Jogging	12	30	15	-3	-0.20

Surya namaskar	29	30	15	14	0.93
Quick relaxation technique	24	30	15	9	0.60
Yogasana standing posture Trikonasana	28	30	15	13	0.87
Prasarita padottasana	7	30	15	-8	-0.53
Padahastasana	18	30	15	3	0.20
Ardhchakrasana	25	30	15	10	0.67
Supine postures Sarvangasana	18	30	15	3	0.20
Halasana	19	30	15	4	0.27
Sitting postures Vakrasana	29	30	15	14	0.93
Paschimottanasana	25	30	15	10	0.67
Ustrasana	20	30	15	5	0.33
Vajrasana	18	30	15	3	0.20
Mandukasana	13	30	15	-2	-0.13
Prone Postures Bhujangasana	23	30	15	8	0.53
Salabhasana	17	30	15	2	0.13
Dhanurasana	22	30	15	7	0.47
Hamsasana	12	30	15	-3	-0.20
Pranayama Kapalbhati	20	30	15	5	0.33
Vibhagiya pranayam	24	30	15	9	0.60
Nadishodhana	29	30	15	14	0.93
Sitali	11	30	15	-4	-0.27
Ujjayi pranayama	15	30	15	0	0.00
Bhramari	24	30	15	9	0.60
Akara chanting	27	30	15	12	0.80
Ukara chanting	28	30	15	13	0.87
Mkara chanting	27	30	15	12	0.80
Omkara chanting	29	30	15	14	0.93
Om meditation	25	30	15	10	0.67
Kriyas Jalaneti	13	30	15	-2	-0.13
Sutra neti	11	30	15	-4	-0.27
Vamanadhouti	19	30	15	4	0.27
Laghu shanka prakshalana	20	30	15	5	0.33
Trataka	16	30	15	1	0.07
Average	20.31	30	15	5.31	0.35
SD	5.95	0	0	5.95	0.40

PRACTICES WITH CVR 0.33 AND ABOVE

	Name of the Pracitices	
1	Hands stretch breathing	0.4
	Loosening exercises	
2	Forward and backward bending	0.53
3	Side bending exercise	0.87
4	Twist leg apart exercise	0.53
5	Wind releasing pose exercise	0.8
6	Surya namaskara	0.93
7	Quick relaxation technique	0.6
8	Trikonasana	0.87
9	Ardhachakrasana	0.67
10	Vakrasana	0.93
11	Paschimottanasana	0.67
12	Ustrasana	0.33
13	Bhujangasana	0.53
14	Dhanurasana	0.47
15	Kapalbhati	0.33
16	Vibhagiya pranayama	0.6
17	Nadishodhana	0.93
18	Bhramari	0.6
19	Akara chanting	0.8
20	Ukara chanting	0.87
21	Makara chanting	0.8
22	Omkara chanting	0.93
23	Om meditation	0.67
24	Laghu shanka praksalana	0.33

5 RESULTS

The mean CVR ratio achieved is o .35 for the 30 experts.As per the Lawshe's CVR ratio the minimum value for 30 experts is 0.33, which means the CVR value achieved to evaluate the content validity of the entire protocol is found to be significant and the protocol is valid to be used as an intervention for diabetic patients which is approved by yoga experts.

The CVR ratio when checked in each and every practice, then a range of deviated results can be seen.

As seen in table it is found that few practices like,Jalaneti, sutraneti,IRT,trataka were not found to be directly related to DM. These practices were either as a complimentary pose for an important posture to align the body and mind level or these practices are meant to get a good relaxation at a particular place which was earlier stretched in performing other practices. Due to these supportive reasons, experts have not rated as essential for DM which finally led to less CVR value for qualifying to the significant value point.

Apart from those practices all other practices were rated to be essential for diabetes and this made the final CVR value(mean value) to satisfy the minimum value as stated by Lawshe's CVR ratio.

Table

NAME OF PRACTICES	CVR
Breathing exercises	
Hands in and out breathing	0.07
Hands stretch breathing	0.40
St leg raising	0.07
Rabbit breathing	0.00
Instant relaxation technique	0.27
Loosening exercises forward and backward	0.53
Side bending	0.87
Twisting leg apart exercise	0.53
Butterfly loosening	-0.13
Wind releasing pose exercise	0.80
Plough pose to forward bend exercise	0.07
Jogging	-0.20
Surya namaskar	0.93
Quick relaxation technique	0.60

Yogasana standing posture Trikonasana	0.87
Prasarita padottasana	-0.53
Padahastasana	0.20
Ardhchakrasana	0.67
Supine postures Sarvangasana	0.20
Halasana	0.27
Sitting postures Vakrasana	0.93
Paschimottanasana	0.67
Ustrasana	0.33
Vajrasana	0.20
Mandukasana	-0.13
Prone Postures Bhujangasana	0.53
Salabhasana	0.13
Dhanurasana	0.47
Hamsasana	-0.20
Pranayama Kapalbhati	0.33
Vibhagiya pranayam	0.60
Nadishodhana	0.93
Sitali	-0.27
Ujjayi pranayama	0.00
Bhramari	0.60
Akara chanting	0.80
Ukara chanting	0.87
Mkara chanting	0.80
Omkara chanting	0.93
Om meditation	0.67
Kriyas Jalaneti	-0.13
Sutra neti	-0.27
Vamanadhouti	0.27
Laghu shanka prakshalana	0.33
Trataka	0.07

As the practices of yoga are not meant to be noted used as pills which is once palatable then can be engulfed in seconds. But the practices of yoga are very much dependent on the

practical applicability, flexibility, safety and stamina of the patient.As all the practices have been already used in the RCT's and the experts do accept that all their patients of diabetes can do these practices, certifies that there is more chances of acceptibilty of this protocol with major positive effect and minimum negative effects.

Conclusion:

This is the first time when well defined yoga therapy module has been modified and compiled for the research background, classical texts and has been scientifically validated by the experts from different parts of the country.

This brings greater acceptability and a good skill on to yoga therapy and research to study few more RCT's and evaluate its overall effects.

Limitations:

All the practices do not have research proven background. Hence this protocol once goes for RCT can become a curtain raiser for future.

Breathing exercises	Ne	N	N/2	Ne-N/2	(Ne-N/2)/N/2
Hands in and out breathing	16	30	15	1	0.07
Hands stretch breathing	21	30	15	6	0.40
St leg raising	16	30	15	1	0.07
Rabbit breathing	15	30	15	0	0.00
Instant relaxation technique	19	30	15	4	0.27
Loosening exercises forward and backward	23	30	15	8	0.53
Side bending	28	30	15	13	0.87
Twisting leg apart exercise	23	30	15	8	0.53
Butterfly loosening	13	30	15	-2	-0.13
Wind releasing pose exercise	27	30	15	12	0.80
Plough pose to forward bend exercise	16	30	15	1	0.07
Jogging	12	30	15	-3	-0.20
Surya namaskar	29	30	15	14	0.93
Quick relaxation technique	24	30	15	9	0.60
Yogasana standing posture Trikonasana	28	30	15	13	0.87
Prasarita padottasana	7	30	15	-8	-0.53
Padahastasana	18	30	15	3	0.20
Ardhchakrasana	25	30	15	10	0.67
Supine postures Sarvangasana	18	30	15	3	0.20
Halasana	19	30	15	4	0.27
Sitting postures Vakrasana	29	30	15	14	0.93

Paschimottanasana	25	30	15	10	0.67
Ustrasana	20	30	15	5	0.33
Vajrasana	18	30	15	3	0.20
Mandukasana	13	30	15	-2	-0.13
Prone Postures Bhujangasana	23	30	15	8	0.53
Salabhasana	17	30	15	2	0.13
Dhanurasana	22	30	15	7	0.47
Hamsasana	12	30	15	-3	-0.20
Pranayama Kapalbhati	20	30	15	5	0.33
Vibhagiya pranayam	24	30	15	9	0.60
Nadishodhana	29	30	15	14	0.93
Sitali	11	30	15	-4	-0.27
Ujjayi pranayama	15	30	15	0	0.00
Bhramari	24	30	15	9	0.60
Akara chanting	27	30	15	12	0.80
Ukara chanting	28	30	15	13	0.87
Mkara chanting	27	30	15	12	0.80
Omkara chanting	29	30	15	14	0.93
Om meditation	25	30	15	10	0.67
Kriyas Jalaneti	13	30	15	-2	-0.13
Sutra neti	11	30	15	-4	-0.27
Vamanadhouti	19	30	15	4	0.27
Laghu shanka prakshalana	20	30	15	5	0.33
Trataka	16	30	15	1	0.07
Average	20.31	30	15	5.31	0.35
SD	5.95	0	0	5.95	0.40

6. DISCUSSION

The results achieved tells that the protocol can be considered to be valid and can be used as an Intervention for diabetes. Experts agree with the protocol, where as the standard deviation tells that the opinions were fluctuating in different levels. But final result (mean) satisfies the protocol is valid with the stated CVR value as per Lawshe's CVR ratios.

Although there have been many clinical trials done on yoga using different protocols of yoga as an intervention and they have found good results stating the highest significant value.But this protocol is quiet valuable because it hold all those randomized clinical trials and then this acquired result has been tabulated in the form of table and has been finally sent to experts to evaluate. This exactly means that the protocol is double verified and the best of the best is to be used in future. These practices which have a proven stamp of RCT's research publications or from classical texts and then have been suggested by experts make a big impact.

Not only talking about the effectiveness and impact of these practices have undergone through the exclusion and inclusion criteria for which they are supposed to be used.This meansthe contra-indication part of these practices has been reduced as is significantly valid and applicable for the patients of diabetes.

As the practices of yoga are not meant to be noted used as pills which is once palatable then can be engulfed in seconds. But the practices of yoga are very much dependent on the practical applicability, flexibility, safety and stamina of the patient. As all the practices have been already used in the RCT's and the experts do accept that all their patients of diabetes can do these practices, certifies that there is more chances of acceptibilty of this protocol with major positive effect and minimum negative effects.

7. CONCLUSION

This is the first time when well defined yoga therapy module has been modified and compiled for the research background, classical texts and has been scientifically validated by the experts from different parts of the country.

This brings greater acceptability and a good skeleton on to yoga therapy and researches to study few more RCT's and evaluate its overall effects.

8. LIMITATIONS

All the practices do not have research proven background. Hence this protocol once goes for RCT can become a curtain raiser for future

10. APPENDIX

List of panelists with qualification and experience

S.No	Name of the Experts	Educational Qualification	Experience
1	Dr Raghavendra Swamy	BNYS	5YEARS
2	Dr Raghavendra Bhat	Phd (yoga)	5
3	Dr Sanjeeb Patra	Phd (yoga)	7 YEARS
4	Dr Ashwin Bilgi	BAMS MD	5 YEARS
5	Dr Suhas	Phd (yoga)	5 YEARS
6	Shailesh Pradhan	MSc PGDYT	6YEARS
7	Dr Rudranath	Phd (yoga)	6YEARS
8	Dr Arpana P V	BAMS MD	5YEARS
9	Dr H C Shashikiran	BAMS MD (scholar)	5YEARS
10	Dr P P Pawadashetti	Phd	7 YEARS
11	Dr A R Seetaram	Phd	15 YEARS
12	Dr Shyamsundar J	Phd	5YEARS
13	Sri S R Bhaktal	YIC	10YEARS
14	Dr M S Arer	Phd	6 YEARS
15	Dr C R Lamani	Phd	5 YEARS
16	Dr Sanjaykumar	Phd (yoga)	5 YEARS
17	Dr Asvini R	BAMS MD	5YEARS
18	Dr Raghavendra Pai	D lit PGDYS	10 YEARS
19	Nayeem Shaikh	PGDYS	5 YEARS
20	Sri Damodara Hegde	PGDYS	6 YEARS
21	Dr Priyanka Patil	BNYS MD	5 YEARS
22	Dr Vani Jeeragal	BNYS MD	5YEARS

23	Dr Shatirpathiy G	BNYS MD SCHOLAR	5YEARS
24	Dr Subramanya Pailoor	Phd (yoga)	5YEARS
25	Dr Chandrakant K K	BNYS MD SCHOLAR	5YEARS
26	Dr Arun Tulsi K P	BNYS MD SCHOLAR	5YEARS
27	Dr N Vijayaraghavan	BNYS MD SCHOLAR	5YEARS
28	Dr S E Mahadevan	BNYS MD SCHOLAR	5YEARS
29	Dr P Kumaresan	BNYS MD SCHOLAR	5YEARS
30	Dr M Sofia	BNYS MD SCHOLAR	5YEARS
	TOTAL		

VALIDATION OF IAYT (INTEGRATED APPROACH OF YOGA THERAPY) MODULE FOR TYPE 2 DIABETES.

QUESTIONNAIRE FOR FACE AND CONTENT VALIDITY **Needs in the questionnaire covers the 3 domains in DM TYPE2**		
Please mark the appropriate number to each component of the following grid, according to the needs of diabetes mellitus type 2		
0	**1**	**2**
NOT NECESSARY	**USEFUL BUT NOT ESSENTIAL**	**ESSENTIAL**

sl no	Practice English	Practice Samskrit	Rounds /cycles	Time in mts	SCORE 0/1/2
	Breathing exercises				
1	Hands in and out breathing		5	1mt	
2	Hands stretch/tiger stretch		5	1mt	
3	St leg raising/Ankle stretch		5	1mt	
4	Shashankasana breathing		5		
		Total time for breathing ex			
5	INSTANT RELAX TECHNIQUE		5	2mt	
		Total			
2	**LOOSENING EXERCISES**	SHITILIKARANA VYAYAMA			
2.1	Forward and backward bending	Padahastasana ardhchakrasana kriya	10	1mt	
2.2	Side bending	Trikonasana kriya	10	1mt	
2.3	Twisting leg apart	Parivritta trikonasana kriya	10	1 mt	
2.4	Butterfly loosening	Baddha konasana kriya	15	1mt	
2.5	Wind releasing pose exercise	Pavana muktasana kriya	5	1mt	
2.6	Plough pose to forward bend	Halasana paschimottasana kriya	5	1mt	
2.7	Jogging		50	1mt	
		Total for loosening ex		7mts	
3.0	**Surya namaskar**	**Sun salutation**	3	3mt	
	QUICK RELAXATION TECHNIQUE			3mt	
4.0	**YOGA POSTURES**	**YOGASANAS**			
4.1	STANDING POSTURES				
4.1.1	Triangle pose/twisted angle/side angle pose	Trikonasana/Parsvakonasana or Pariivrittatrikonasana		1mt	

Sl no	Practice English	Practice Samskrit	Roundes /cycles	Time in mts	SCORE 0/1/2
4.1.2	Spreaded leg intense stretch/Tree posture	Prasaritapadottanasana /Parshva Uttanasana/Vriksasana		1mt	
4.1.3		Padahastasana/ Mandukasana		1/2mt	
4.1.4	Half wheel /side half wheel postures	Ardhachakrasana/ Ardhkatichakrasana		1/2mt	
		Total for standing postures		3mts	
4.2	SUPINE POSTURES				
4.2.1	Shoulder stand pose	Sarvangasana/ Viparita karani		1mt	
4.2.2	Plough pose/Fish posture/Bridge posture	Halasana/Matyasana /Setubandasana		1mt	
		Total time for supine postures		2 mts	
4.3	SITTING POSTURES				
4.3.1		Vakrasana/ Ardhmatsyendrasan		1mt	
4.3.2		Paschimottanasana/ Janusirasana 0r Baddhakonasana		1mt	
4.3.3	Camel pose/half camel pose	Ustrasana/ Ardha-ustrasana		1/2mt	
4.3.4		Vajrasana/Padmasana		1/2mt	
4.3.5	Frog posture	Mandukasana		1mt	
		Total time for sitting postures		4mts	
4.4	**PRONE POSTURE**				
4.4.1.	Cobra posture	Bhujangasana /ekapadarajkapotasan		1/2mt	
4.4.2	Locust posture	salabhasana		1/2mt	
4.4.3	Bow pose	Dhanurasana		1 mt	
4.4.4		Hamsasana/Mayurasana		1mt	
		Total time for prone posture		3mts	
5.0	VITAL ENERGY REGULATION/BREATHING	PRANAYAMA			
5.1	PREPARATORY/FORCEFUL EXHALATION	Kapalbhati	120 strokes	1 mt	

5.2	Sectional breathing	Vibhagiya pranayama	5	1mt	
5.3	Alternate nostril breathin	Nadishodana	9	2mt	
5.4	Cooling pranayama	Sitali/sitkari	5	1mt	
5.5		Ujjayi pranayama	5	1mt	
5.6	The bumble bee chant	Bhramari	5	1mt	
		TOTAL TIME		7MT	

Sl no	**Practice English**	**Practice Samskrit**	**Rounds /cycles**	**Time in mts**	**SCORE 0/1/2**
6.0	MEDITATION	DHYANA			
6.1	Sound resonance techniq	Nadanusandhana			
		A- KARA	9	1& 1/2	
		U- KARA	9	1&1/2	
		M-KARA	9	1&1/2	
		AUM-KARA	9	1&1/2	
		Total		6mts	
6.2	OM MEDITATION /YOGANIDRA	OM DHYANA		10MTS	
7.0	KRIYAS				
7.1		Jalaneti	Weekly once		
		Sutraneti	Weekly once		
		Vamana dhouti	Weekly once		
		Laghu shankha Prakshalana	Once a week		
		Trataka	Once a week		

Sl no	Practices	Time duration (In mts)
1	BREATHING PRACTICE	5
2	IRT	2
3	LOOSENING EXERCISES	7
4	SURYANAMASKAR	3
5	QRT	3
6	ASANAS	11
7	DRT	6
8	PRANAYAM	7
9	NADANUSANDHAN	6
10	OM MEDITATION 0R YOGANIDRA	10
	TOTAL TIME	60 MTS

PLEASE GO THROUGH THE YOGA PROGRAMME AND CIRCLE/FILL THE APPROPRIATE RESPONSES.

I Is the programme content developed in keeping with the aim of study?			
NOT AT ALL	**MODERATELY**	**VERY MUCH**	**SCORE**
0	1	2	

2 Do you think overall the yoga programme will achieve its objective of correcting the problem in diabetes mellitus type2 ?			
NOT AT ALL	**MODERATELY**	**VERY MUCH**	**SCORE**
0	1	2	

3 Suggestions for adding / deleting any content from the programme .

4 Comments

5 Signature and details of the validation expert .

Signature

Full name

emailid

Mobile no

Designation

Address

		Breathing exercises				
S.No.	Name of the Experts	Hands in & Out	Hands/ Tiger Stretch Strecth	Straight Leg Raising/ Ankle Stretch	Rabit Breathing	**Instant Relaxation Technique**
1	Dr Raghavendra Swamy	E	U	U	N	E
2	Dr Raghavendra Bhat	U	E	U	U	E
3	Dr Sanjeeb Patra	U	U	E	U	E
4	Dr Ashwin Bilgi	U	E	E	E	E
5	Dr Suhas	E	E	E	E	E
6	Shailesh Pradhan	E	E	E	E	E
7	Dr Rudranath	E	E	E	E	E
8	Dr Arpana P V	E	E	E	E	U
9	Dr H C Shashikiran	U	U	N	N	E
10	Dr P P Pawadashetti	E	E	U	U	E
11	Dr A R Seetaram	E	E	E	E	E
12	Dr Shyamsundar J	E	E	E	E	E
13	Sri S R Bhaktal	E	E	E	E	U
14	Dr M S Arer	E	U	E	E	E
15	Dr C R Lamani	E	E	E	U	E

16	Dr Sanjaykumar	E	E	E	U	E
17	Dr Asvini R	E	E	E	U	E
18	Dr Raghavendra Pai	U	E	U	E	U
19	Nayeem Shaikh	U	U	E	E	U
20	Sri Damodara Hegde	E	U	E	E	U
21	Dr Priyanka Patil	U	U	U	U	E
22	Dr Vani Jeeragal	E	E	U	U	E
23	Dr Shatirpathiy G	U	E	U	E	U
24	Dr Subramanya Pailoor	U	U	U	N	N
25	Dr Chandrakant K K	U	E	U	U	U
26	Dr Arun Tulsi K P	U	E	U	U	U
27	Dr N Vijayaraghavan	U	E	U	E	U
28	Dr S E Mahadevan	U	U	U	U	E
29	Dr P Kumaresan	U	E	U	U	U
30	Dr M Sofia	E	E	E	E	E
	TOTAL	**16**	**21**	**16**	**15**	**19**

		Loosening Exercise						
S.No.	Name of the Experts	Forward & Backward Bending	Side Bending	Twisting Leg Apaart	Butterfly Loosening	Wind Releasing Pose Exercise	Plough pose to forward bending	Jogging
1	Dr Raghavendra Swamy	U	E	E	E	E	N	N
2	Dr Raghavendra Bhat	E	E	E	U	E	U	U
3	Dr Sanjeeb Patra	U	E	E	U	E	E	N
4	Dr Ashwin Bilgi	E	E	E	U	E	E	E
5	Dr Suhas	E	E	E	E	E	E	E
6	Shailesh Pradhan	E	E	E	E	E	E	E
7	Dr Rudranath	E	E	E	E	E	E	E
8	Dr Arpana P V	E	E	E	E	E	U	U
9	Dr H C Shashikiran	E	E	E	N	E	E	U
10	Dr P P Pawadashetti	E	E	E	E	E	E	U
11	Dr A R Seetaram	E	E	U	E	E	E	U
12	Dr Shyamsundar J	E	E	E	E	E	E	E

13	Sri S R Bhaktal	E	E	E	E	U	U	E
14	Dr M S Arer	E	E	E	U	E	E	E
15	Dr C R Lamani	E	E	E	U	E	E	E
16	Dr Sanjaykumar	E	E	E	E	E	E	E
17	Dr Asvini R	E	E	U	U	E	U	E
18	Dr Raghavendra Pai	E	E	E	E	E	E	E
19	Nayeem Shaikh	E	E	E	U	E	E	U
20	Sri Damodara Hegde	U	U	U	E	E	U	U
21	Dr Priyanka Patil	U	E	E	N	E	U	N
22	Dr Vani Jeeragal	E	E	U	U	E	E	U
23	Dr Shatirpathiy G	U	E	E	E	N	U	U
24	Dr Subramanya Pailoor	U	E	U	N	E	U	N
25	Dr Chandrakant K K	E	E	N	U	E	N	U
26	Dr Arun Tulsi K P	E	E	E	U	E	E	N
27	Dr N Vijayaraghavan	E	U	E	N	E	U	N
28	Dr S E Mahadevan	U	E	E	U	U	U	N
29	Dr P Kumaresan	E	E	U	U	E	N	U
30	Dr M Sofia	E	E	E	U	E	U	E
	TOTAL	**23**	**28**	**23**	**13**	**27**	**16**	**12**

				Asanas (Standing Postures)			
S.No	Name of the Experts	**Surya Namaskara**	**Quick Relaxation Technique**	Trikonasana / Parsvakonasana/ Parivritta trikonasana	Prasaritapadottasana/ Parsva Uttanasana/ Vriksasana	Padahastasana	Ardha chakrasana/ Ardhakati chakrasana
1	Dr Raghavendra Swamy	E	E	E	U	E	E
2	Dr Raghavendra Bhat	E	E	E	U	U	E
3	Dr Sanjeeb Patra	E	E	E	U	U	E
4	Dr Ashwin Bilgi	E	E	E	E	E	E
5	Dr Suhas	E	E	E	U	E	E
6	Shailesh Pradhan	E	E	E	E	E	E

7	Dr Rudranath	E	E	E	E	E	E
8	Dr Arpana P V	E	U	E	U	U	U
9	Dr H C Shashikiran	E	E	E	U	E	E
10	Dr P P Pawadashetti	E	E	E	U	E	E
11	Dr A R Seetaram	E	E	E	U	U	E
12	Dr Shyamsundar J	E	E	E	E	E	E
13	Sri S R Bhaktal	E	E	E	U	E	E
14	Dr M S Arer	E	E	E	U	E	E
15	Dr C R Lamani	E	E	E	E	E	E
16	Dr Sanjaykumar	E	E	E	E	U	E
17	Dr Asvini R	E	E	E	U	N	U
18	Dr Raghavendra Pai	E	U	E	E	E	E
19	Nayeem Shaikh	E	U	E	U	E	E
20	Sri Damodara Hegde	E	U	U	U	E	U
21	Dr Priyanka Patil	U	U	E	N	U	E
22	Dr Vani Jeeragal	E	E	E	N	E	E
23	Dr Shatirpathiy G	E	E	U	U	U	E
24	Dr Subramanya Pailoor	E	U	E	U	U	N
25	Dr Chandrakant K K	E	E	E	N	E	E
26	Dr Arun Tulsi K P	E	E	E	U	E	E
27	Dr N Vijayaraghavan	E	E	E	U	U	E
28	Dr S E Mahadevan	E	E	E	U	U	E
29	Dr P Kumaresan	E	E	E	N	U	E
30	Dr M Sofia	E	E	E	U	E	U
	TOTAL	**29**	**24**	**28**	**7**	**18**	**25**

		Asanas (Supine Postures)		**Asanas (Sitting Postures)**				
S.No.	Name of the Experts	Sarvangasana/ Viparit Karani	Halasana / Matsyasana/ Setubandasana	Vakrasana/ Ardamatsendrasana	Paschimmottanasana / Janusirasana/ Baddhakonasana	Ustrasana/ Ardaustrasana	Vajrasana/ Padmasana	Mandukasana
1	Dr Raghavendra Swamy	N	U	E	E	U	E	U
2	Dr Raghavendra Bhat	E	E	E	E	E	E	U
3	Dr Sanjeeb Patra	E	E	E	E	E		U

4	Dr Ashwin Bilgi	N	U	E	E	U	E	N
5	Dr Suhas	U	E	E	E	E	E	N
6	Shailesh Pradhan	E	E	E	E	E	E	E
7	Dr Rudranath	E	E	E	E	E	E	E
8	Dr Arpana P V	U	U	E	E	U	E	E
9	Dr H C Shashikiran	N	E	E	E	E	U	N
10	Dr P P Pawadashetti	E	E	E	E	E	E	E
11	Dr A R Seetaram	E	E	E	E	E	E	U
12	Dr Shyamsundar J	E	E	E	E	E	E	E
13	Sri S R Bhaktal	E	E	E	E	E	E	E
14	Dr M S Arer	E	E	E	E	E	E	E
15	Dr C R Lamani	E	E	E	E	E	U	U
16	Dr Sanjaykumar	E	E	E	E	E	U	U
17	Dr Asvini R	E	U	E	U	U	E	N
18	Dr Raghavendra Pai	E	E	E	E	E	E	U
19	Nayeem Shaikh	E	E	E	E	E	U	E
20	Sri Damodara Hegde	U	N	E	U	E	U	E
21	Dr Priyanka Patil	N	U	E	U	U	U	N
22	Dr Vani Jeeragal	E	E	E	E	U	E	E
23	Dr Shatirpathiy G	U	E	E	E	E	U	U
24	Dr Subramanya Pailoor	N	U	E	E	E	U	U
25	Dr Chandrakant K K	U	U	E	E	E	E	E
26	Dr Arun Tulsi K P	E	E	E	U	U	E	E
27	Dr N Vijayaraghavan	E	U	U	E	U	U	U
28	Dr S E Mahadevan	N	N	E	U	U	N	U
29	Dr P Kumaresan	U	U	E	E	E	E	E
30	Dr M Sofia	E	E	E	E	U	U	U
	TOTAL	**18**	**19**	**29**	**25**	**20**	**18**	**13**

		Asanas (Prone Postures)			
S.No.	Name of the Experts	Bhujangasana/ Ekapadarajakaputasana	Shalabasana	Dhanurasana	Hamsasana/ Mayurasana
1	Dr Raghavendra Swamy	U	E	E	U
2	Dr Raghavendra Bhat	U	U	E	E
3	Dr Sanjeeb Patra	E	E	U	U
4	Dr Ashwin Bilgi	U	U	E	E
5	Dr Suhas	E	E	E	U
6	Shailesh Pradhan	E	N	E	E
7	Dr Rudranath	E	E	E	E
8	Dr Arpana P V	E	E	N	N
9	Dr H C Shashikiran	E	U	E	E
10	Dr P P Pawadashetti	E	E	E	E

11	Dr A R Seetaram	E	E	E	U
12	Dr Shyamsundar J	E	E	E	E
13	Sri S R Bhaktal	E	E	E	U
14	Dr M S Arer	E	E	E	E
15	Dr C R Lamani	E	E	E	U
16	Dr Sanjaykumar	E	E	E	U
17	Dr Asvini R	E	E	E	U
18	Dr Raghavendra Pai	E	E	E	U
19	Nayeem Shaikh	E	E	E	U
20	Sri Damodara Hegde	U	U	U	N
21	Dr Priyanka Patil	U	U	U	N
22	Dr Vani Jeeragal	E	N	E	U
23	Dr Shatirpathiy G	U	U	U	E
24	Dr Subramanya Pailoor	E	E	E	U
25	Dr Chandrakant K K	E	N	E	U
26	Dr Arun Tulsi K P	U	U	E	E
27	Dr N Vijayaraghavan	E	U	U	E
28	Dr S E Mahadevan	E	N	U	E
29	Dr P Kumaresan	E	N	U	N
30	Dr M Sofia	E	E	E	U
	TOTAL	**23**	**17**	**22**	**12**

Pranayama							
S.No.	Name of the Experts	Kapalbhati	Vibhagiya Pranayama	Nadishodhana	shithali/ Shitkari	Ujjayi Pranayama	Bhramari
1	Dr Raghavendra Swamy	N	E	E	E	E	E
2	Dr Raghavendra Bhat	E	U	E	E	U	E
3	Dr Sanjeeb Patra	E	E	E	E	U	E
4	Dr Ashwin Bilgi	E	U	E	U	E	E
5	Dr Suhas	U	E	E	U	E	U
6	Shailesh Pradhan	E	E	E	E	E	E
7	Dr Rudranath	E	E	E	E	E	E
8	Dr Arpana P V	U	E	E	U	U	U
9	Dr H C Shashikiran	E	E	E	U	U	U
10	Dr P P Pawadashetti	E	E	E	E	E	E
11	Dr A R Seetaram	E	E	E	E	E	E
12	Dr Shyamsundar J	E	E	E	E	E	E
13	Sri S R Bhaktal	E	E	E	U	U	E
14	Dr M S Arer	E	E	E	E	E	E
15	Dr C R Lamani	E	E	E	U	E	E

16	Dr Sanjaykumar	U	E	E	U	E	E
17	Dr Asvini R	U	E	E	U	E	E
18	Dr Raghavendra Pai	E	E	E	U	U	E
19	Nayeem Shaikh	E	E	E	U	U	E
20	Sri Damodara Hegde	E	E	E	U	N	E
21	Dr Priyanka Patil	U	N	E	N	U	U
22	Dr Vani Jeeragal	E	E	E	U	U	E
23	Dr Shatirpathiy G	U	U	U	E	E	E
24	Dr Subramanya Pailoor	U	U	E	U	E	E
25	Dr Chandrakant K K	E	E	E	U	U	E
26	Dr Arun Tulsi K P	E	U	E	U	U	U
27	Dr N Vijayaraghavan	E	E	E	U	U	N
28	Dr S E Mahadevan	U	E	E	E	E	E
29	Dr P Kumaresan	E	E	E	U	N	E
30	Dr M Sofia	U	E	E	U	U	E
	TOTAL	**20**	**24**	**29**	**11**	**15**	**24**

			Nadhanusandhana			
S.No.	Name of the Experts	**Dhyana (Meditation)**	A- Kara	U- Kara	M- Kara	AUM-Kara
1	Dr Raghavendra Swamy		E	E	E	E
2	Dr Raghavendra Bhat		E	E	E	E
3	Dr Sanjeeb Patra		E	E	E	E
4	Dr Ashwin Bilgi		U	E	U	E
5	Dr Suhas		E	E	E	E
6	Shailesh Pradhan		E	E	E	E
7	Dr Rudranath		E	E	E	E
8	Dr Arpana P V		E	E	E	E
9	Dr H C Shashikiran		E	E	E	E
10	Dr P P Pawadashetti		E	E	E	E
11	Dr A R Seetaram		E	E	E	E
12	Dr Shyamsundar J		E	E	E	E
13	Sri S R Bhaktal		U	U	U	E
14	Dr M S Arer		E	E	E	E
15	Dr C R Lamani		E	E	E	E
16	Dr Sanjaykumar		E	E	E	E
17	Dr Asvini R		E	E	E	E
18	Dr Raghavendra Pai		E	E	E	E
19	Nayeem Shaikh		E	E	E	E
20	Sri Damodara Hegde		E	E	E	E
21	Dr Priyanka Patil	E	E	E	E	E
22	Dr Vani Jeeragal	E	E	E	E	E
23	Dr Shatirpathiy G		E	E	E	E
24	Dr Subramanya Pailoor		E	E	E	E

25	Dr Chandrakant K K		E	E	E	E
26	Dr Arun Tulsi K P		E	E	E	E
27	Dr N Vijayaraghavan		U	U	U	U
28	Dr S E Mahadevan		E	E	E	E
29	Dr P Kumaresan		E	E	E	E
30	Dr M Sofia		E	E	E	E
	TOTAL	**2**	**27**	**28**	**27**	**29**

		Om	**Kriyas**				
S.No.	Name of the Experts	**Dhyana/ Yoganidra**	Jalaneti	Sutraneti	Vaman douti	Laghu shanka prakshalana	Trataka
1	Dr Raghavendra Swamy	E	E	E	E	E	E
2	Dr Raghavendra Bhat	U	U	U	E	E	U
3	Dr Sanjeeb Patra	E	E	E	E	E	U
4	Dr Ashwin Bilgi	U	E	E	E	E	E
5	Dr Suhas	E	E	E	E	E	E
6	Shailesh Pradhan	E	E	E	E	E	E
7	Dr Rudranath	E	E	E	E	E	E
8	Dr Arpana P V	E	U	U	E	U	E
9	Dr H C Shashikiran	E	U	U	E	E	E
10	Dr P P Pawadashetti	E	E	E	U	U	U
11	Dr A R Seetaram	E	U	U	U	E	E
12	Dr Shyamsundar J	E	E	E	E	E	E
13	Sri S R Bhaktal	E	U	U	N	N	U
14	Dr M S Arer	E	E	E	E	E	E
15	Dr C R Lamani	E	E	E	E	E	U
16	Dr Sanjaykumar	E	E	E	E	E	E
17	Dr Asvini R	E	E	N	U	E	E
18	Dr Raghavendra Pai	E	U	U	E	E	U
19	Nayeem Shaikh	E	U	U	E	E	E
20	Sri Damodara Hegde	U	U	N	U	N	U
21	Dr Priyanka Patil	E	N	N	U	U	U
22	Dr Vani Jeeragal	E	U	N	E	E	E
23	Dr Shatirpathiy G	E	U	N	E	U	U
24	Dr Subramanya Pailoor	U	N	N	E	U	N

25	Dr Chandrakant K K	E	N	N	U	E	E
26	Dr Arun Tulsi K P	E	N	N	E	E	N
27	Dr N Vijayaraghavan	E	U	U	N	N	U
28	Dr S E Mahadevan	E	E	U	U	N	U
29	Dr P Kumaresan	E	N	N	U	E	E
30	Dr M Sofia	U	U	U	U	U	U
	TOTAL	**25**	**13**	**11**	**19**	**20**	**16**

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