APPENDICES

APPENDIX 1 : NADI TARANGINI

The setup of *Nāḍī Taraṅgiṇi,* as shown in **Fig A1.1**, consists of a pulse acquisition device which consists of three sensors and the system is connected to a computer which stores the data in digital form.

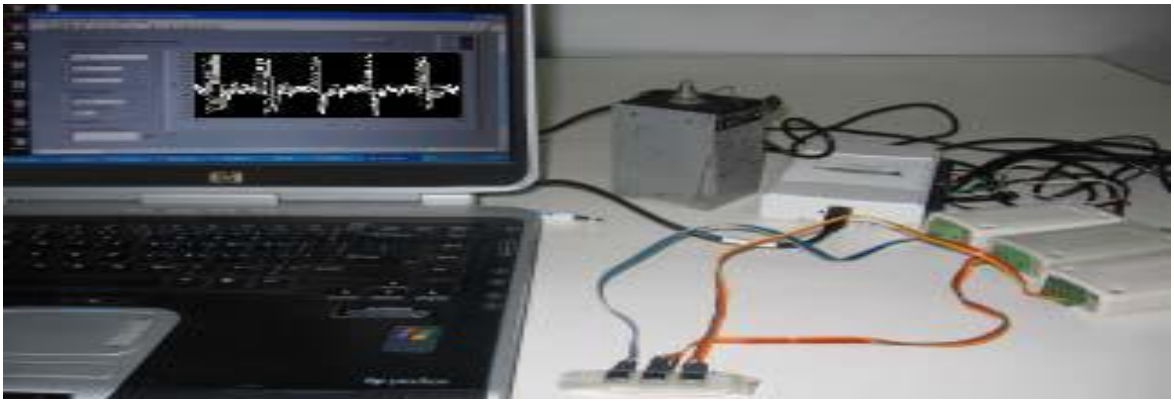

Fig A1.1. Nadi Tarangini Setup

Nāḍī Taraṅgiṇi in its current form consists of the following three major components as shown in **Fig A1.2**

A set of three pressure sensors which converts the pulses at *vāta, pitta* and *kapha* locations to electrical signals

Analog to Digital converter for digitizing the analog signals and providing it to the computer for processing

Software to capture the data and process it to generate the meaningful data

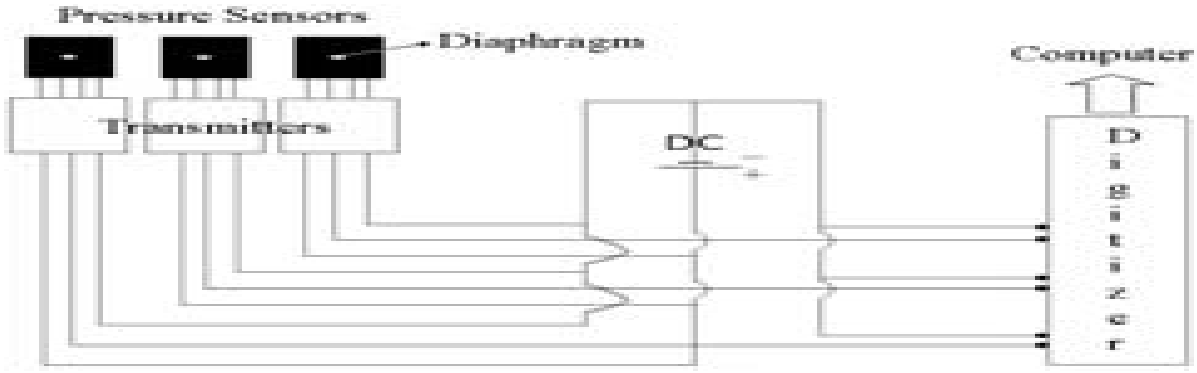

Fig A1.2 Components of Nadi Tarangini

The pulse based diagnosis is gaining importance with the advent of *Nāḍī Taraṅgiṇi* which is able to capture the *Nāḍī* data accurately. The reproducibility and completeness of *Nāḍī Taraṅgiṇi* has been validated and studies have shown that the harmonics of the pulse wave and beat to beat alterations were varying significantly with age and disorder (A. Joshi, Chandran, Jayaraman, & Kulkarni, 2007). The pulse rate variability of the pulse measured using *Nāḍī Taraṅgiṇi* has shown similar effects as in heart rate variability (A. J. Joshi, Chandran, Jayaraman, & Kulkarni, 2008a). The spectral analysis of pulse data acquired by *Nāḍī Taraṅgiṇi* showed variations in range and area based on age and disorder of the person (A. J. Joshi, Chandran, Jayaraman, & Kulkarni, 2008b). The pulse wave acquired using *Nāḍī Taraṅgiṇi* is similar to digital volume pulse from PPG with clear systolic and diastolic peaks in place. The parameters stiffness index, augmentation index and reflection index measure the arterial stiffness and these parameters can be extracted from the *Nāḍī* data. The pulse parameters measuring the arterial stiffness along with second derivative ratios can be studied extensively to unravel the hidden secrets of traditional *Nāḍī Parīkṣa*.

APPENDIX 2

Informed Consent form for patients, participating in Significance Of Arterial Stiffness in *Tridoṣa* Analysis An Exploratory Study In The Context Of *Āyurveda*

Name of Organization: Swami Vivekananda Yoga Anusandhana Samsthana (S-VYASA)

Name of Principal Investigator: P Venkata Giri Kumar

Name of Program: PhD (Yoga)

This Informed Consent Form has two parts:

- Information Sheet (to share information about the research with you)
- Certificate of Consent (for signatures if you agree to take part)

You will be given a copy of the full Informed Consent Form

PART I: Information Sheet

Introduction

I am P Venkata Giri Kumar doing my PhD at S-VYASA and we are doing research on study of arterial stiffness across Tridosha locations in the context of Āyurveda . As part of our research we need to collect Pulse data using an instrument Nadi Tarangini from the radial artery of the wrist. I would like to invite you to be part of this research and you can talk to anyone you feel comfortable with about the research and then decide whether to

participate or not. There may be some words that you do not understand, please ask us to stop as we go through the information and I will take time to explain.

Purpose of the research

Āyurveda has very strong roots in pulse based diagnosis but it is subjective in nature and depends on the skill of the physician. It lacks the scientific evidence which is the need of the day as evidence based research is gaining importance in accepting any medicine or system of medicine. To strengthen the research in *Āyurveda* there is a need for assessing *Tridoṣas* like any other clinical parameter such as blood pressure, fasting blood sugar etc.

Type of Research Intervention

This research will involve measuring Nadi (pulse) using non-invasive instrument by name Nadi Tarangini. It does not involve any radiation and there will not be any harm.

Participant selection

We are inviting healthy persons who fit into the inclusion and exclusion criterial as explained by research protocol.

Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. You may change your mind later and stop participating even if you agreed earlier

Duration

The scope of current research is to study the Nadi (pulse) in the context of Āyurveda and there is no intervention.

Side Effects

Nadi Tarangini is a non-invasive instrument and there will not be any side effects while measuring the Nadi.

Risks

There will not be any risk in participating in this research.

Benefits

There will not be any direct benefit to the participants but your participation will help us in finding the answer to the research question and future generations are likely to benefit.

Reimbursements

You will not be given any money or gifts to take part in this research.

Confidentiality

The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will be put away and no-one but the researchers will be able to see it. Any information about you will have a number on it instead of your name. Only the researchers will know what your number is

and we will lock that information up with a lock and key. It will not be shared with or given to anyone except the people involved in the research.

Sharing the Results

The knowledge that we get from doing this research will be shared with you through community meetings before it is made widely available to the public. Confidential information will not be shared. There will be small meetings in the community and these will be announced. After these meetings, we will publish the results in order that other interested people may learn from our research.

Right to Refuse or Withdraw

You do not have to take part in this research if you do not wish to do so. You may also stop participating in the research at any time you choose. It is your choice and all of your rights will still be respected.

Who to Contact

If you have any questions you may ask them now or later, even after the study has started. If you wish to ask questions later, you may contact P Venkata Giri Kumar (9880658950, girikumar.pv@gmail.com)

This proposal has been reviewed and approved by S-VYASA IRB which is a committee whose task it is to make sure that research participants are protected from harm. . If you wish to find about more about the IRB, contact The technical coordinator, IEC-SVYASA, No.19, 'Eknath Bhavan', Gavipuram circle, Kempegoda Nagar, Bengaiuru-560019 Telephone number- 08026612669.

You can ask me any more questions about any part of the research study, if you wish to.

Do you have any questions?

PART II: Certificate of Consent

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Print Name of Participant_____

Signature of Participant _____

Date _____

Day/month/year

If illiterate

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Print name of witness_____ AND Thumb print of participant

Signature of witness _____

Date _____

Day/month/year

Statement by the researcher/person taking consent

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the Nadi data will be collected using Nadi Tarangini

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this ICF has been provided to the participant.

Print Name of Researcher/person taking the consent_____

Signature of Researcher /person taking the consent_____

Date _____

Day/month/year

APPENDIX 3: INSTITUTIONAL ETHICS COMMITTEE APPROVAL

स्वामी विवेकानन्द योग अनुसंधान संस्थान
Swami Vivekananda Yoga Anusandhāna Samsthāna
(Declared as Deemed-to-be University under Section 3 of the UGC Act, 1956)
Eknath Bhavan, # 19, Gavipuram Circle, Kempegowda Nagar, Bangalore - 560 019
Ph: 080 - 2661 2669, Telefax: 080 - 2660 8645
E-mail: svyasa@svyasa.org Website: www.svyasa.org

RES/IEC-SVYASA/92/2017 **22 July 2017**

To,
Dr. Sudheer Deshpande,
Joint Director,
Division of Yoga and Physical Science,
S-VYASA University,
Bengaluru.

Reference:

"Significance of Arterial Stifness in Tridosa Analysis An Exploratory Study in the Context of Ayurveda". - Committee Approval of the above mentioned study.

Dear Dr. Sudheer Deshpande,

We have received from you the following study related documents vide your letter dated 30 August 2016

1	Project Proposal
2	Informed consent form

Ethics committee meeting was held on **24 September 2016** between 2:00 PM and 5:00 PM at Eknath Bhavan, Bengaluru. Above documents were examined and discussed in the meeting. After due consideration, the committee has decided to approve conducting the aforementioned study.

APPROVED
Subramanya
INSTITUTIONAL ETHICS COMMITTEE
SVYASA, BANGALORE

स्वामी विवेकानन्द योग अनुसंधान संस्थान
Swami Vivekananda Yoga Anusandhāna Samsthāna
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Eknath Bhavan, # 19, Gavipuram Circle, Kempegowda Nagar, Bangalore - 560 019
Ph: 080 - 2661 2669, Telefax: 080 - 2660 8645
E-mail: svyasa@svyasa.org Website: www.svyasa.org

This is to confirm that neither Dr. Sudheer Deshpande nor any staff participating in this study were involved in the voting procedures and decision making.

The Institutional Review Board / Institutional Ethics Committee (IEC) are expected to be informed about the progress of the study / any changes in the protocol and patient information / informed consent. The investigators are also expected to submit a copy of the final report to IEC for records.

This approval is valid up to the completion of the study at the site.

Please submit to the IEC, the status report of the study as per the SOPs.

The IEC is organized & operates according to the requirements of ICH-GCP, Indian Council of Medical Research Guidelines & Schedule Y.

Best Wishes,

Subramanya P.

Dr. Subramanya P,
Member Secretary,
Institutional Ethics Committee,
S-VYASA, Bengaluru.

APPENDIX 4: LIST OF PUBLICATIONS

Title: Significance of Arterial Stiffness in *Tridoṣa* Analysis: A Pilot Study

Journal: Journal of Ayurveda and Integrative Medicine (JAIM)

Authors: P.Venkata Giri Kumar, Sudheer Deshpande, Aniruddha Joshi, Pooja More, H.R. Nagendra

Title: Association of Arterial Stiffness Measured from *Tridoṣas* with Diabetes, A Cross Sectional Study

Journal: Journal of Ayurvedic and Herbal Medicine (JAHM)

Authors: P.Venkata Giri Kumar, Sudheer Deshpande, Aniruddha Joshi, Pooja More, H.R. Nagendra

Title: Effect of Integrated Yoga Therapy on Arterial Stiffness: A Pilot Study on Young and Older Adults with Obesity

Journal: Integrative and International Medicine (IIM)

Authors: P.Venkata Giri Kumar, Sudheer Deshpande, Aniruddha Joshi, Pooja More, Amit Singh, H.R. Nagendra

Title: Traditional Practices and Recent Advances in Nadi Pariksha: A Comprehensive Review

Journal: Journal of Ayurveda and Integrative Medicine (JAIM)

Authors: P. Venkata Giri Kumar, Sudheer Deshpande, H.R. Nagendra

APPENDIX 5: IAYT Program

Table A5.1: Integrated Yoga program schedule for Group1 and Group3

Program	Description
Loosening exercises	
(10 rounds each)	Toe, ankle, knee, waist, wrist , shoulder, neck rotation and bending
	Sakti vikasaka sukshma vyayama for wrists, palms, fingers, elbows, arms, back,
	thighs and calf muscles
Yogasanas	
(1 to 2 min)	Ardhakati Cakrasana, Ardha Cakrasana, Pada Hastasana, Bhujangasana
	Salabhasana, Dhanurasana, Sarvangasana, Matsyasana, Viparitakarani
	Halasana, Cakrasana, Sasankasana, Vakrasana, Ardha Matsyendrasana
	Ustrasana,
	Instant Relaxation Technique (1 min),
	Quick Relaxation Technique (3 min),
	Deep Relaxation Technique (3 min)
Pranayama	
	Kapalbhati (40 to 120 strokes/min), Sectional breathing (5 rounds),
	Surya and Candra Anuloma Viloma Pranayama (21 rounds)
	Nadi Sudhi Pranayama (9 rounds), cooling and Bhramari Pranayama (9 rounds)
Meditation	
	Nadanusandhana (3 min),
	OM Meditation (15 min)
Kriya	
	Jala Neti
	Sutra Neti
	Vamana Dhouti

Table A5.2: Integrated yoga program schedule for Group2

Program	Description
Loosening Exercises	
(10 rounds each) touching	Jogging, forward, backward and side bending, twisting, toe and heel
	knee rotation, pavanamuktasana kriya, rocking and rolling,
	alternate knee touching, lumbar stretch, tiger stretch, Back and
	side stretch,
	free walk, baby walk, camel and crow walk, frog jump, step climbing,
	diagonal jumps, spinal twist, jumping,
	Surya namaskar (6 to 12 rounds),
	Instant Relaxation Technique (2 min),
	Quick Relaxation Technique (2 min),
	Deep Relaxation Technique (6 min)
Yogasanas	
(10 rounds)	Ardha padmasana, Bhujangasana, Salabhasana, Dhanurasana,
	Naukasana, Navasana, parvatasana, vakrasana,
Pranayama	
	Sectional breathing (5 rounds)
	Surya anuloma viloma pranayama (27 rounds)
	Nadi sudhi pranayama (5 rounds),
	Bhramari pranayama (5 rounds)
Meditation	
	Nadanusandhana (9 rounds),
	OM Meditation (15 min)
Kriyas	
	Kapalbhati, Jal Neti, Sutra Neti, Vamana dhouti
	Sankha Prakshalana

APPENDIX 6: DATA

TRIDOSA STUDY

VPK: 0 = vāta, 1 = pitta and 2 = kapha

HT – Height of the subject

SBP -- Systolic Blood Pressure

DBP -- Diastolic Blood Pressure

BMI -- Body Mass Index

SI -- Stiffness Index

RI -- Reflection Index

NAME	VPK	Age	Gender	HT	SBP	DBP	BMI	SI	RI
S_062	0	41	2	165	147	99	31.221	5.85	0.878
P_108	0	41	2	195	104	72	17.62	4.875	0.79
P_121	0	42	1	172	110	80	25.352	5.85	0.88
P_111	0	43	1	172	112	68	18.253	5.15	0.72
S_006	0	45	1	168	132	77	20.798	5.35	0.834
P_043	0	46	2	162	110	70	30.14	5.625	0.718
P_124	0	46	2	153	122	78	27.383	5.885	0.886
P_110	0	50	2	160	140	80	27.344	5.37	0.804
S_061	0	52	1	171	109	73	23.939	5.31	0.842
S_060	0	52	1	169	130	80	31.862	3.42	0.859
P_085	0	52	2	160	128	70	26.172	6.665	0.849
P_084	0	53	1	172	134	96	27.042	6.275	0.779
P_003	0	53	1	175	130	80	22.857	5.61	0.888

P_017	0	54	1	172	114	80	21.971	6.615	0.786
P_147	0	54	2	154.9	90	60	28.34	7.105	0.884
S_048	0	56	1	173	95	67	25.059	4.885	0.843
P_047	0	56	1	165	120	80	27.916	5.61	0.653
P_087	0	56	1	172	116	80	22.377	4.97	0.916
S_039	0	57	1	161	120	72	18.132	5.225	0.851
S_051	0	58	1	168	140	86	21.259	4.1	0.828
P_022	0	59	1	170	110	80	23.529	6.205	0.96
P_032	0	59	1	175	110	90	21.224	5.68	0.964
S_018	0	60	1	173	123	66	22.888	6.92	0.877
P_011	0	60	1	158	128	70	28.241	4.135	0.78
P_101	0	60	1	166	110	70	21.52	6.435	0.783
S_023	0	60	2	145	122	84	27.301	4.62	0.885
S_031	0	60	2	158	173	85	20.229	5	0.89
S_027	0	62	1	161	156	68	24.536	5.065	0.759
S_074	0	63	1	159	160	90	29.667	5.76	0.753
P_001	0	64	1	168	130	80	32.667	6.27	0.925
P_072	0	64	1	165	170	78	23.508	6.875	0.859
P_025	0	64	1	167	130	80	23.307	5.25	0.949
P_012	0	64	2	146	144	80	30.494	2.535	0.89
S_053	0	65	1	168	174	78	18.778	9.765	0.92
P_034	0	65	1	191	110	60	15.625	5.895	0.884
S_013	0	65	1	154	172	98	24.709	5.035	0.836

S_022	0	67	1	165	171	96	23.912	6.82	0.926
P_060	0	67	1	160	130	80	27.344	5.715	0.857
S_011	0	69	1	167	147	94	27.107	5.125	0.715
P_076	0	69	1	164	130	90	27.811	7.195	0.882
P_094	0	75	1	166	120	86	26.564	6.805	0.914
S_063	0	81	1	151	173	73	21.929	5.245	0.828
S_018	1	58	1	173	123	66	22.888	10.18	0.968
S_p_016	1	58	1	159	175	104	25.157	10.75	0.822
S_031	1	58	2	158	173	85	20.229	9.875	0.974
P_223	1	40	1	176	110	68	21.597	8.545	0.982
K_015	1	42	1	166	108	76	29.721	4.3	0.868
P_121	1	42	1	172	110	80	25.352	6.275	0.933
P_229	1	43	1	172.7	120	70	26.152	6.49	0.98
P_190	1	44	1	165	100	80	25.712	6.55	0.978
P_160	1	45	1	193	100	80	24.699	9.105	0.977
P_293	1	45	2	160	110	70	28.438	5.635	0.93
Y_P_21	1	45	2	148	136	82	26.936	13.96	0.971
S_005	1	46	1	167	128	89	26.641	10.71	0.966
P_124	1	46	2	153	122	78	27.383	5.975	0.964
P_049	1	48	1	167	140	80	27.609	6.525	0.815
P_286	1	50	1	165	128	76	23.875	17.94	0.993
P_110	1	50	2	160	140	80	27.344	6.4	0.946
S_060	1	52	1	169	130	80	31.862	11.27	0.968

K_003	1	54	1	171	124	68	19.835	12.39	0.987
P_227	1	54	2	152.4	120	70	20.667	8.965	0.968
P_047	1	56	1	165	120	80	27.916	6.76	0.919
P_196	1	58	2	155	110	80	32.008	5.065	0.906
P_162	1	60	1	165	112	68	15.06	12.89	0.957
Y_30	1	61	1	165	136	84	23.875	11.62	0.994
S_050	1	61	2	164	151	89	27.142	9.88	0.972
S_p_027	1	62	1	161	156	68	24.42	5.67	0.963
P_001	1	64	1	168	130	80	32.667	9.765	0.978
P_215	1	64	1	153.5	128	86	30.557	7.995	0.942
Y_24	1	64	1	174	128	96	23.781	10.12	0.948
S_053	1	65	1	168	174	78	18.778	10.64	0.904
P_034	1	65	1	191	110	60	15.625	7.46	0.95
S_013	1	65	1	154	172	98	24.709	9.165	0.91
P_179	1	65	2	165	130	80	30.119	6.935	0.951
P_219	1	67	1	168	120	78	24.802	12.73	0.976
P_060	1	67	1	160	130	80	27.344	6.955	0.929
P_080	1	67	2	157	130	68	25.153	4.51	0.964
K_p_014	1	68	1	168	144	76	28.168	4.35	0.894
S_p_011	1	69	1	167	147	94	27.107	19.88	0.957
P_157	1	70	1	165	130	80	24.242	7.175	0.952
P_205	1	70	1	152	130	68	19.477	8.835	0.947
P_285	1	70	1	170	110	70	25.952	5.82	0.844

P_180	1	80	1	160	150	98	16.406	4.495	0.969
P_214	1	87	1	178	118	78	22.093	13.69	0.976
S_002	2	58	1	162	130	80	23.434	11.91	0.851
P_223	2	40	1	176	110	68	21.597	12.4	0.921
P_121	2	42	1	172	110	80	25.352	7.35	0.949
K_015	2	42	1	166	108	76	29.721	6.06	0.909
P_111	2	43	1	172	112	68	18.253	5.66	0.873
P_293	2	45	2	160	110	70	28.438	7.145	0.947
Y_p_009	2	45	2	163	128	78	24.163	5.095	0.982
Y_p_021	2	45	2	165	118	68	16.896	5.98	0.944
K_013	2	46	1	170	128	86	27.578	11.81	0.909
Y_026	2	46	1	164	134	100	22.308	7.385	0.974
S_005	2	46	1	167	128	89	26.641	8.79	0.982
P_286	2	50	1	165	128	76	23.875	9.82	0.956
P_217	2	50	1	168	126	80	21.471	9.13	0.982
P_236	2	50	1	163	140	90	26.045	5.95	0.956
P_110	2	50	2	160	140	80	27.344	6.725	0.931
Y_P_066	2	51	1	170	130	86	27.682	8.335	0.964
P_243	2	51	1	167.6	140	90	32.04	4.68	0.966
P_151	2	53	1	178	128	96	22.093	5.74	0.902
K_p_002	2	53	1	169	126	78	25.559	6.655	0.977
P_003	2	53	1	175	130	80	22.857	14.12	0.978
P_017	2	54	1	172	114	80	21.971	8.6	0.964

K_p_003	2	54	1	171	124	68	19.835	7.915	0.925
Y_p_005	2	55	2	140	124	90	34.694	6.085	0.964
P_047	2	56	1	165	120	80	27.916	6.705	0.958
P_173	2	58	2	157.5	120	80	39.506	8.12	0.98
P_032	2	59	1	175	110	90	21.224	6.25	0.969
P_162	2	60	1	165	112	68	15.06	10.86	0.975
Y_30	2	61	1	165	134	98	27.548	7.57	0.992
Y_075	2	64	1	173	120	84	25.393	5.805	0.893
P_072	2	64	1	165	170	78	23.508	16.5	0.996
P_215	2	64	1	153.5	128	86	30.557	6.09	0.97
Y_024	2	64	1	174	144	96	24.112	10.88	0.958
P_034	2	65	1	191	110	60	15.625	4.57	0.933
S_013	2	65	1	154	172	98	24.709	8.75	0.952
Y_068	2	66	1	170	118	82	21.799	7.52	0.984
P_172	2	67	1	165	126	82	29.752	6.155	0.965
K_p_014	2	68	1	168	144	76	28.168	3.255	0.907
Y_079	2	68	2	149	136	86	27.927	5.685	0.94
S_p_011	2	69	1	167	147	94	27.107	11.14	0.951
P_076	2	69	1	164	130	90	27.811	12.82	0.978
P_157	2	70	1	165	130	80	24.242	6.395	0.988
P_285	2	70	1	170	110	70	25.952	8.5	0.975

DIABETES STUDY

VPK: 0 = vāta, 1 = pitta and 2 = kapha

HT – Height of the subject

FBS – Fasting Blood Sugar

DM2 -- Type2 Diabetes Mellitus

SBP -- Systolic Blood Pressure

DBP -- Diastolic Blood Pressure

BMI – Body Mass Index

SI -- Stiffness Index

RI -- Reflection Index

NAME	VPK	Age	Gender	DM2	FBS	HT	SBP	DBP	BMI	SI	RI
P_001	0	64	1	0	102	168	130	80	32.667	6.27	0.925
P_003	0	53	1	0	115	175	130	80	22.857	5.61	0.888
P_005	0	33	2	1	267	165	130	88	25.528	5.095	0.9
P_006	0	43	1	1	166	165	120	80	22.773	5.77	0.803
P_011	0	60	1	0	99	158	128	70	28.241	4.135	0.78
P_012	0	64	2	0	107	146	144	80	30.494	2.535	0.89
P_015	0	73	1	1	138	175	110	70	20.245	6.16	0.842
P_017	0	54	1	0	100	172	114	80	21.971	6.615	0.786
P_022	0	59	1	0	95	170	110	80	23.529	6.205	0.96
P_025	0	64	1	0	123	167	130	80	23.307	5.25	0.949
P_026	0	52	2	1	136	154	138	82	18.975	5.745	0.899
P_030	0	58	2	1	311	155	100	80	31.217	5.915	0.873
P_032	0	59	1	0	101	175	110	90	21.224	5.68	0.964

P_033	0	38	1	1	134	168	120	70	28.593	5.915	0.886
P_034	0	65	1	0	93	191	110	60	15.625	5.895	0.884
P_036	0	70	1	1	141	175	120	90	26.776	4.395	0.861
P_037	0	59	2	1	171	155	130	90	24.974	5.655	0.877
P_040	0	54	1	1	127	167	138	80	31.661	7.015	0.89
P_041	0	49	2	0	94	160	110	70	34.375	7.08	0.852
P_043	0	46	2	0	118	162	110	70	30.14	5.625	0.718
P_044	0	55	2	1	167	160	130	80	31.25	7.145	0.757
P_047	0	56	1	0	101	165	120	80	27.916	5.61	0.653
P_051	0	50	1	1	215	172	110	74	24.676	6.665	0.816
P_053	0	44	2	0	118	157	112	68	22.313	3.81	0.798
P_056	0	60	1	1	300	185	88	68	18.115	6.47	0.887
P_059	0	43	1	1	140	163	120	80	20.701	6.13	0.902
P_060	0	67	1	0	116	160	130	80	27.344	5.715	0.857
P_063	0	53	1	1	169	167	140	90	25.1	6.14	0.662
P_072	0	64	1	0	115	165	170	78	23.508	6.875	0.859
P_074	0	52	1	1	381	168	142	80	19.841	6.665	0.947
P_076	0	69	1	0	105	164	130	90	27.811	7.195	0.882
P_079	0	65	1	1	222	190	120	70	18.837	7.54	0.881
P_083	0	52	1	1	138	167	138	90	24.741	6.375	0.889
P_084	0	53	1	0	79	172	134	96	27.042	6.275	0.779
P_085	0	52	2	0	86	160	128	70	26.172	6.665	0.849
P_086	0	22	2	1	211	157	100	90	22.76	5.605	0.955

P_087	0	56	1	0	118	172	116	80	22.377	4.97	0.916
P_089	0	49	1	1	155	170	140	90	24.221	6.54	0.726
P_090	0	62	1	1	127	161	134	96	29.706	7.19	0.895
P_091	0	65	1	1	215	165	164	68	20.937	6.76	0.67
P_094	0	75	1	0	95	166	120	86	26.564	6.805	0.914
P_101	0	60	1	0	87	166	110	70	21.52	6.435	0.783
P_102	0	36	1	1	245	162	128	88	25.149	5.16	0.911
P_104	0	45	1	1	159	165	120	70	26.593	5.5	0.899
P_107	0	76	1	0	96	162	138	90	30.483	3.785	0.775
P_108	0	41	2	0	90	195	104	72	17.62	4.875	0.79
P_109	0	56	1	1	136	168	160	80	27.105	5.675	0.852
P_110	0	50	2	0	118	160	140	80	27.344	5.37	0.804
P_111	0	43	1	0	106	172	112	68	18.253	5.15	0.72
P_115	0	63	1	1	173	168	120	80	22.357	5	0.971
P_118	0	63	1	1	451	170	130	84	30.83	5.09	0.819
P_119	0	53	1	1	126	173	134	90	32.945	6.27	0.814
P_120	0	56	1	1	197	175	120	60	34.286	6.63	0.867
P_121	0	42	1	0	103	172	110	80	25.352	5.85	0.88
P_124	0	46	2	0	100	153	122	78	27.383	5.885	0.886
P_126	0	76	2	1	135	155	12	60	16.649	5.785	0.778
P_127	0	47	2	1	181	155	114	80	28.72	5.575	0.839
P_141	0	62	1	1	133	172	130	78	25.318	5.77	0.682
P_143	0	56	1	1	236	169	140	70	22.717	5.365	0.82

P_145	0	60	2	1	181	152	130	90	29.519	5	0.912
P_147	0	54	2	0	121	155	90	60	28.34	7.105	0.884
P_153	0	62	1	1	134	168	120	72	25.632	6.255	0.809
P_156	0	53	1	1	196	174	130	90	25.301	7.565	0.962
P_159	0	39	1	1	139	175	120	94	27.755	6.435	0.931
P_161	0	65	1	1	213	165	140	70	26.299	6.205	0.851
P_163	0	39	1	1	160	175	110	80	30.041	4.915	0.816
P_165	0	31	1	1	216	170	100	72	20.761	5.665	0.85
S_006	0	45	1	0	76.8	168	132	77	20.798	5.35	0.834
S_011	0	69	1	0	93	167	147	94	27.107	5.125	0.715
S_013	0	65	1	0	102	154	172	98	24.709	5.035	0.836
S_016	0	60	1	0	87	159	175	104	25.157	5.64	0.86
S_017	0	60	1	1	147	164	109	65	26.286	5.395	0.742
S_018	0	60	1	0	99	173	123	66	22.888	6.92	0.877
S_019	0	60	1	1	164	160	145	89	23.633	5.675	0.942
S_022	0	67	1	0	98	165	171	96	23.912	6.82	0.926
S_023	0	60	2	0	80	145	122	84	27.301	4.62	0.885
S_024	0	60	1	0	80	161	166	94	22.684	4.28	0.933
S_026	0	71	1	0	80	158	170	80	20.229	6.585	0.846
S_027	0	62	1	0	122	161	156	68	24.536	5.065	0.759
S_028	0	68	1	1	140	166	137	74	20.105	5.39	0.934
S_029	0	67	1	1	216	157	147	64	20.528	4.265	0.883
S_031	0	60	2	0	108	158	173	85	20.229	5	0.89

S_039	0	57	1	0	97.3	161	120	72	18.132	5.225	0.851
S_045	0	47	1	1	144	156	178	92	29.586	6.14	0.823
S_048	0	56	1	0	107	173	95	67	25.059	4.885	0.843
S_050	0	61	2	0	124	164	151	89	27.142	4.02	0.723
S_051	0	58	1	0	102	168	140	86	21.259	4.1	0.828
S_055	0	73	2	0	109	156	170	66	24.655	2.59	0.673
S_056	0	73	1	0	116	163	142	72	21.454	2.975	0.665
S_058	0	56	1	0	78.1	159	145	87	28.084	6.515	0.866
S_060	0	52	1	0	125	169	133	80	31.862	3.42	0.859
S_061	0	52	1	0	117	171	109	73	23.939	5.31	0.842
S_062	0	41	2	0	77.1	165	147	99	31.221	5.85	0.878
S_063	0	81	1	0	117	151	173	73	21.929	5.245	0.828
S_065	0	38	1	0	82.5	152	128	95	27.268	7.24	0.932
S_066	0	58	2	0	99	158	163	72	20.429	4.115	0.824
S_067	0	54	2	1	223	158	146	85	27.64	6.32	0.815
S_069	0	58	1	1	144	172	128	81	27.042	4.455	0.816
S_072	0	53	2	1	152	155	186	106	27.055	4.815	0.867
S_074	0	63	1	0	76.1	159	160	90	29.667	5.76	0.753
K_003	1	54	1	0	108	171	124	68	19.835	12.39	0.987
K_005	1	75	1	1	154	174	122	88	24.012	5.54	0.955
K_007	1	54	1	1	308	162	134	74	24.996	6	0.901
K_015	1	42	1	0	109	166	108	76	29.721	4.3	0.868
K_p_009	1	40	2	1	144	154	156	100	39.467	6.11	0.946

K_p_014	1	68	1	0	107	168	144	76	28.168	4.35	0.894
P_001	1	64	1	0	102	168	130	80	32.667	9.765	0.978
P_015	1	73	1	1	138	175	110	70	20.245	9.615	0.973
P_019	1	69	1	1	164	170	130	80	24.221	4.75	0.945
P_021	1	34	1	1	214	167	128	70	20.725	6.475	0.959
P_033	1	38	1	1	134	168	120	70	28.593	8.66	0.967
P_034	1	65	1	0	93	191	110	60	15.625	7.46	0.95
P_036	1	70	1	1	141	175	120	90	26.776	6.075	0.92
P_037	1	59	2	1	171	155	130	90	24.974	4.875	1.028
P_038	1	43	2	1	230	160	130	80	27.344	6.105	1.061
P_047	1	56	1	0	101	165	120	80	27.916	6.76	0.919
P_049	1	48	1	0	123	167	140	80	27.609	6.525	0.815
P_051	1	50	1	1	215	172	110	74	24.676	6.615	0.967
P_056	1	60	1	1	300	185	88	68	18.115	8.81	0.968
P_060	1	67	1	0	116	160	130	80	27.344	6.955	0.929
P_063	1	53	1	1	169	167	140	90	25.1	5.25	0.964
P_065	1	56	2	1	225	152	198	90	21.641	8	1.034
P_066	1	56	1	1	148	175	148	68	22.857	9.115	0.888
P_079	1	65	1	1	222	190	120	70	18.837	9.05	0.911
P_080	1	67	2	0	100	157	130	68	25.153	4.51	0.964
P_086	1	22	2	1	211	157	100	90	22.76	6.945	0.959
P_091	1	65	1	1	215	165	164	68	20.937	6.3	0.928
P_101	1	60	1	0	87	166	110	70	21.52	11.69	0.96

P_110	1	50	2	0	118	160	140	80	27.344	6.4	0.946
P_121	1	42	1	0	103	172	110	80	25.352	6.275	0.933
P_124	1	46	2	0	100	153	122	78	27.383	5.975	0.964
P_126	1	76	2	1	135	155	12	60	16.649	9.12	1.042
P_127	1	47	2	1	181	155	114	80	28.72	5.495	1.042
P_130	1	60	1	0	75	163	140	90	25.751	11.95	0.946
P_141	1	62	1	1	133	172	130	78	25.318	12.47	0.993
P_144	1	66	1	1	285	165	110	70	24.5	8.25	0.925
P_149	1	54	1	1	184	167	120	70	24.275	10.44	0.97
P_153	1	62	1	1	134	168	120	72	25.632	3.79	0.948
P_157	1	70	1	0	100	165	130	80	24.242	7.175	0.952
P_160	1	45	1	0	113	193	100	80	24.699	9.105	0.977
P_161	1	65	1	1	213	165	140	70	26.299	10.06	0.934
P_162	1	60	1	0	94	165	112	68	15.06	12.89	0.957
P_166	1	60	2	1	160	160	120	80	22.656	7.545	1.034
P_169	1	62	1	1	295	168	133	80	29.548	9.525	0.973
P_176	1	55	1	1	187	162	100	60	21.605	8.525	0.984
P_179	1	65	2	0	118	165	133	80	30.119	6.935	0.951
P_180	1	80	1	0	116	160	150	98	16.406	4.495	0.969
P_185	1	64	2	0	97	163	164	60	20.45	4.145	0.977
P_190	1	44	1	0	109	165	100	80	25.712	6.55	0.978
P_196	1	58	2	0	107	155	110	80	32.008	5.065	0.906
P_205	1	70	1	0	117	152	130	68	19.477	8.835	0.947

P_207	1	70	2	1	144	140	110	76	37.755	6.73	1.148
P_214	1	87	1	0	115	178	118	78	22.093	13.69	0.976
P_215	1	64	1	0	101	154	128	86	30.557	7.995	0.942
P_219	1	67	1	0	90.9	168	120	78	24.802	12.73	0.976
P_221	1	64	1	1	145	169	144	88	22.863	8.62	0.98
P_223	1	40	1	0	109	176	110	68	21.597	8.545	0.982
P_224	1	70	1	1	163	168	126	90	29.548	5.27	0.907
P_227	1	54	2	0	110	152	120	70	20.667	8.965	0.968
P_229	1	43	1	0	106	173	120	70	26.152	6.49	0.98
P_285	1	70	1	0	102	170	110	70	25.952	5.82	0.844
P_286	1	50	1	0	89	165	128	76	23.875	17.94	0.993
P_293	1	45	2	0	86	160	110	70	28.438	5.635	0.93
S_002	1	58	1	0	65.3	162	133	80	25.72	5.19	0.924
S_005	1	46	1	0	93.6	167	128	89	26.641	10.71	0.966
S_007	1	50	2	1	182	157	131	90	23.733	6.765	1.095
S_013	1	65	1	0	102	154	172	98	24.709	9.165	0.91
S_017	1	58	1	1	147	164	109	65	26.286	9.32	0.982
S_018	1	58	1	0	99	173	123	66	22.888	10.18	0.968
S_019	1	58	1	1	164	160	145	89	23.633	5.925	0.913
S_020	1	58	1	1	203	159	129	70	20.687	6.31	0.976
S_028	1	68	1	1	140	166	137	74	20.105	6.29	0.916
S_031	1	58	2	0	108	158	173	85	20.229	9.875	0.974
S_050	1	61	2	0	124	164	151	89	27.142	9.88	0.972

S_053	1	65	1	0	82.8	168	174	78	18.778	10.64	0.904
S_059	1	52	1	1	331	161	105	65	17.36	5.71	0.927
S_060	1	52	1	0	125	169	133	80	31.862	11.27	0.968
S_068	1	67	1	1	386	155	112	66	19.147	7.045	0.982
S_p_006	1	45	1	0	76.8	168	132	77	20.798	5.35	0.925
S_p_011	1	69	1	0	93	167	147	94	27.107	19.88	0.957
S_p_016	1	58	1	0	87	159	175	104	25.157	10.75	0.822
S_p_022	1	67	1	0	98	165	171	96	23.912	9.27	0.971
S_p_027	1	62	1	0	122	161	156	68	24.42	5.67	0.963
S_p_038	1	47	1	1	177	162	143	101	23.624	10	0.953
S_p_054	1	65	2	1	184	160	118	77	29.297	4.82	0.844
S_p_074	1	63	1	0	76.1	159	160	90	29.667	5.76	0.942
Y_24	1	64	1	0	102	174	128	96	23.781	10.12	0.948
Y_30	1	61	1	0	115	165	136	84	23.875	11.62	0.994
Y_P_21	1	45	2	0	118	148	136	82	26.936	13.96	0.971
K_005	2	75	1	1	154	174	122	88	24.012	5.92	1.085
K_006	2	56	1	1	178	164	160	96	37.589	7.32	0.96
K_008	2	72	1	1	133	176	116	68	24.6	4.755	0.877
K_013	2	46	1	0	94	170	128	86	27.578	11.81	0.909
K_015	2	42	1	0	109	166	108	76	29.721	6.06	0.909
K_p_001	2	60	1	1	162	162	118	74	21.3	6.135	0.789
K_p_002	2	53	1	0	97	169	126	78	25.559	6.655	0.977
K_p_003	2	54	1	0	108	171	124	68	19.835	7.915	1.088

K_p_014	2	68	1	0	107	168	144	76	28.168	3.255	0.907
P_003	2	53	1	0	115	175	130	80	22.857	14.12	0.978
P_015	2	73	1	1	138	175	110	70	20.245	6.075	0.959
P_017	2	54	1	0	100	172	114	80	21.971	8.6	0.964
P_032	2	59	1	0	101	175	110	90	21.224	6.25	0.969
P_033	2	38	1	1	134	168	120	70	28.593	8.66	0.955
P_034	2	65	1	0	93	191	110	60	15.625	4.57	0.933
P_036	2	70	1	1	141	175	120	90	26.776	3.725	0.956
P_037	2	59	2	1	171	155	130	90	24.974	7.675	1.032
P_047	2	56	1	0	101	165	120	80	27.916	6.705	0.958
P_066	2	56	1	1	148	175	148	66	22.857	7.61	0.971
P_070	2	52	2	1	169	152	133	80	19.477	4.935	0.975
P_072	2	64	1	0	115	165	170	78	23.508	16.5	1.004
P_076	2	69	1	0	105	164	130	90	27.811	12.82	0.978
P_079	2	65	1	1	222	190	120	70	18.837	5.28	1.067
P_086	2	22	2	1	211	157	100	90	22.76	6.655	0.961
P_090	2	62	1	1	127	161	134	96	29.706	9.7	0.967
P_091	2	65	1	1	215	165	164	68	20.937	6.705	1.058
P_092	2	68	1	1	160	104	90	60	69.804	5.255	0.97
P_102	2	36	2	1	245	162	128	88	25.149	8.805	0.986
P_110	2	50	2	0	118	160	140	80	27.344	6.725	0.931
P_111	2	43	1	0	106	172	112	68	18.253	5.66	0.873
P_113	2	63	1	1	347	169	142	90	22.128	6.305	0.971

P_115	2	63	1	1	173	168	120	80	22.357	5.755	0.916
P_121	2	42	1	0	103	172	110	80	25.352	7.35	0.949
P_137	2	49	1	1	171	185	140	100	28.231	6.685	0.976
P_145	2	60	2	1	181	152	130	90	29.519	5.59	1.081
P_149	2	54	1	1	184	167	120	70	24.275	6.625	0.941
P_151	2	53	1	0	90.4	178	128	96	22.093	5.74	0.902
P_153	2	62	1	1	134	168	120	72	25.632	5.515	1.019
P_156	2	53	1	1	196	174	130	90	25.301	9.355	0.977
P_157	2	70	1	0	100	165	130	80	24.242	6.395	0.988
P_162	2	60	1	0	94	165	112	68	15.06	10.86	0.975
P_165	2	31	1	1	216	170	100	72	20.761	5.415	0.955
P_172	2	67	1	0	118	165	126	82	29.752	6.155	0.965
P_173	2	58	2	0	119	158	120	80	39.506	8.12	0.98
P_212	2	35	1	1	337	175	110	80	15.216	6.295	0.956
P_215	2	64	1	0	101	154	128	86	30.557	6.09	0.97
P_217	2	50	1	0	102	168	126	80	21.471	9.13	0.982
P_221	2	64	1	1	145	169	144	88	22.863	5.315	0.886
P_223	2	40	1	0	109	176	110	68	21.597	12.4	0.921
P_224	2	70	1	1	163	168	126	90	29.548	5.05	1.06
P_235	2	60	1	1	173	162	118	68	25.442	7.94	0.974
P_236	2	50	1	0	125	163	140	90	26.045	5.95	0.956
P_241	2	62	1	1	159	163	138	86	26.509	6.945	0.928
P_243	2	51	1	0	125	168	140	90	32.04	4.68	1.037

P_257	2	56	1	1	229	175	134	72	19.592	7.955	1.017
P_262	2	56	1	1	160	175	140	90	21.224	6.435	0.959
P_275	2	58	1	1	158	167	126	84	28.542	5.68	1.028
P_285	2	70	1	0	102	170	110	70	25.952	8.5	0.975
P_286	2	50	1	0	89	165	128	76	23.875	9.82	0.956
P_289	2	58	1	1	176	163	140	90	21.207	5.68	0.919
P_293	2	45	2	0	86	160	110	70	28.438	7.145	1.059
S_002	2	58	1	0	65.3	162	133	80	23.434	11.91	0.851
S_005	2	46	1	0	93.6	167	128	89	26.641	8.79	0.982
S_013	2	65	1	0	102	154	172	98	24.709	8.75	0.952
S_019	2	58	1	1	164	160	145	89	23.633	6.35	0.941
S_059	2	52	1	1	331	161	105	65	17.36	8.475	1.036
S_068	2	67	1	1	386	155	112	66	19.147	8.515	0.99
S_p_011	2	69	1	0	93	167	147	94	27.107	11.14	1.054
Y_024	2	64	1	0	102	174	144	96	24.112	10.88	1.046
Y_026	2	46	1	0	75	164	134	100	22.308	7.385	1.027
Y_068	2	66	1	0	87	170	118	82	21.799	7.52	1.017
Y_075	2	64	1	0	86	173	120	84	25.393	5.805	0.893
Y_079	2	68	2	0	115	149	136	86	27.927	5.685	1.069
Y_30	2	61	1	0	115	165	134	98	27.548	7.57	0.992
Y_p_005	2	55	2	0	70	140	124	90	34.694	6.085	0.964
Y_p_006	2	47	1	1	185	154	146	96	27.829	8.28	0.968
Y_p_009	2	45	2	0	95	163	128	78	24.163	5.095	1.019

Y_p_021	2	45	2	0	122	165	118	68	16.896	5.98	1.063
Y_p_027	2	52	1	1	195	166	140	86	28.669	5.725	0.94
Y_p_028	2	51	2	1	158	149	136	82	26.575	4.745	1.045
Y_p_039	2	65	2	1	140	150	138	92	21.778	5.64	1.037
Y_P_066	2	51	1	0	85	170	130	86	27.682	8.335	0.964
Y_p_32	2	67	2	1	148	144	136	94	28.694	6.205	0.982

OBESITY STUDY

PP – Pre Post (0 = Pre, 1 = Post)

HT – Height of the subject

SBP -- Systolic Blood Pressure

DBP -- Diastolic Blood Pressure

PR – Pulse Rate

BMI -- Body Mass Index

SI -- Stiffness Index

RI -- Reflection Index

Pre IAYT Data

ID	PP	Ht	Gender	age	BMI	PR	SBP	DBP	SI	RI
D_002.txt	0	165	1	76	24.242	66	140	80	15.278	0.93
D_003.txt	0	168	1	24	25.191	82	112	74	20.488	0.952
D_007.txt	0	156	2	40	16.971	80	120	80	9.63	0.985
D_015.txt	0	161	2	76	39.968	78	160	90	17.889	0.935
D_025.txt	0	161	2	54	24.374	70	124	80	26.833	0.938

D_028.txt	0	159	2	58	28.084	86	130	72	10.6	0.892
D_029.txt	0	154	2	51	27.493	69	130	78	18.445	0.97
D_059.txt	0	159	2	50	35.6	76	114	84	20.921	0.993
D_013.txt	0	161	2	23	21.951	86	108	68	18.721	0.992
D_014.txt	0	163	2	56	24.013	70	124	80	16.979	0.973
D021.txt	0	153	2	71	28.63	72	130	82	11.087	0.888
H_018.txt	0	163	1	17	34.25	98	130	100	15.673	0.987
H_026.txt	0	160	2	35	34.766	76	120	80	15.094	0.933
H_040.txt	0	167	2	22	27.481	70	120	82	23.264	0.963
H_043.txt	0	170	2	18	27.209	70	106	78	17.018	0.983
H_066.txt	0	162	1	47	29.895				20.32	0.985
H_068.txt	0	178	1	22	39.136	94	124	88	16.481	0.928
h_044.txt	0	151	2	30	44.735	98	130	82	18.415	0.985

Post IAYT Data

ID	PP	Ht	Gender	age	BMI	PR	SBP	DBP	SI	RI
D_002.txt	0	165	1	76	23.14	84	130	80	12.51	0.93
D_003.txt	0	168	1	24	24.093	75	126	84	24.674	0.968
D_007.txt	0	156	2	40	17.176	66	106	70	18.716	0.985
D_015.txt	0	161	2	76	39.736	78	130	80	9.843	0.98
D_025.txt	0	161	2	54	24.382	74	112	80	21.771	0.951
D_028.txt	0	159	2	58	27.689	78	118	64	10.499	0.986

D_029.txt	0	154	2	51	26.66	80	132	76	17.216	0.972
D_059.txt	0	159	2	50	34.809	78	120	78	20.564	0.993
D_013.txt	0	161	2	23	21.488	83	100	68	16.669	0.99
D_014.txt	0	163	2	56	23.787	74	112	80	14.014	0.996
D021.txt	0	153	2	71	28.562	79	130	80	10.193	0.934
H_018.txt	0	163	1	17	33.686	72	118	68	19.957	0.955
H_026.txt	0	160	2	35	34.141	84	119	76	14.852	0.914
H_040.txt	0	167	2	22	27.088	74	110	70	14.928	0.974
H_043.txt	0	170	2	18	25.551	76	110	70	14.928	0.974
H_066.txt	0	162	1	47	29.895				18.062	0.988
H_068.txt	0	178	1	22	38.284	78	120	90	14.134	0.969
H_044.txt	0	151	2	30	41.226	74	120	80	17.498	0.984

APPENDIX 7: ABBREVATIONS

PWV – Pulse Wave Velocity

cfPWV – Carotid Femoral Pulse Wave Velocity

baPWV – Brachial Ankle Pulse Wave Velocity

PPG – Photoplethysmography

SI – Stiffness Index

RI – Reflection Index

AI – Augmentation Index

IAYT – Integrated Approach of Yoga Therapy

BMI – Body Mass Index

SBP – Systolic Blood Pressure

DBP – Diastolic Blood Pressure

PR – Pulse Rate

FBS – Fasting Blood Sugar

FPG – Fasting Plasma Glucose

HT – Height of the subject

ANOVA – Analysis of Variance

शा. सम्. पू. ख. -- शारङ्गधर संहित पूर्व खंड

śā. sam. pū. kha. śārṅgadhara saṁhitā pūrva khaṇḍa

ब. प्र. प्र. -- बसवराजीयम् प्रथम प्रकरण

ba. pra. pra. basavarājīyam prathama prakaraṇa

यो. र. -- योग रत्नाकर

yo. ra. yoga ratnākara

भा. प्र. -- भाव प्रकाश

bhā. pra. bhāva prakāśa