



Assessment of pathya and apathya status among 30–70-year-old individuals diagnosed with hypertension: a cross sectional study

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ABSTRACT

Background: Hypertension is one of the most common chronic non-communicable disorder in which pressure exerted by blood on the arterial walls is elevated. Around 1.13 billion individuals are affected by hypertension worldwide with two-thirds of it in low- and middle-income countries. In most cases of hypertension, it often remains asymptomatic in the early course of its manifestation. It is one of the most important risk factors in coronary heart disease and cerebrovascular accidents. With more of the population living with hypertension, greater is the need to ensure the best quality of life through holistic approaches such as Ayurveda, nutrition, and yoga. The principles of pathya and apathya of aahar and Vihar in Ayurveda are focused on maintaining good health through a good diet and a good lifestyle.

Methodology: A cross-sectional analysis was performed using data collected from a purposive sampling of 100 hypertensive participants aged 30-70 years from the outpatient department of an Ayurvedic hospital in Mumbai city. Anthropometric parameters (weight, height, BMI, waist circumference, and hip circumference) were taken. Dietary intakes were assessed using 2-day diet recalls and food frequency tables. A questionnaire assessing the blood pressure values, history, and symptoms; aahar (dietary), vihar (sleeping habits and physical activity) according to the pathya principles of Ayurveda for hypertension management were included. Statistical analysis was done using SPSS version 20. Values <0.05 were considered statistically significant.

Results: The participants had a BMI of 28.64 (± 5.5) kg m⁻². The systolic blood pressure and diastolic blood pressure were similar in both males and females, 144.2(± 17.1) mm Hg and 145.4(± 17.5) and 88.4(± 9.7) and 86.9(± 9.5) mm Hg respectively. Headache (24.5%), excessive perspiration (21.4%), and palpitation (17.2%) were the most experienced symptoms in all the participants. 45% of the participants had a family history of hypertension. The prakruti assessment showed kapha prakruti dominance (47.1%) in the participants. The participants consumed both pathya and apathya aahar foods and 75.3% of the participants do not follow pathya for yoga asanas for hypertension. 49.9% of the participants follow apathya aahar for dietary habits, 37.8% of the participants follow apathya vihar for sleeping habits and 85.2% of the participants follow apathya vihar for physical activity. Over eating regularly was correlated with having lower symptomatic relief (p value 0.027).

Conclusion: It can be concluded that people who have hypertension do not adhere to all of the Ayurvedic pathya aahar (dietary practises) and vihar (sleeping routines, physical activity, such as walking and yoga), which are guidelines for managing hypertension. Therefore, the allopathic medication may be responsible for the patients' blood pressure levels being managed. To confirm the antihypertensive impact of aahar and vihar Ayurvedic principles, larger, controlled trials are required.

Keywords: Hypertension, Ayurveda, pathya apathya aahar and vihar, nutrition, holistic treatment

INTRODUCTION

Hypertension is a common disease in the present era. Most adults develop it, in later half of their life (Narayan J et al, 2017). Systemic arterial hypertension (hereafter referred to as hypertension) is characterized by persistently high blood pressure (BP) in the systemic arteries. BP is commonly expressed as the ratio of the systolic BP (that is, the pressure that the blood exerts on the arterial walls when the heart contracts) and the diastolic BP (the pressure when the heart relaxes). (Oparil et al, 2018). Around 1.13 billion individuals are affected by hypertension worldwide with two-third of it in low- and middle-income countries (Arun Goyal et al, 2012). As per WHO, cardiovascular diseases account for around 29% of total deaths from NCDs in India. Essential hypertension contributes to most cases whereas secondary hypertension contributes to around 5–10% cases.

It is a silent killer as very rarely any symptom can be seen in its early stages until a severe medical crisis presents itself as a heart attack, stroke, or chronic kidney disease. Since people are unaware of excessive blood pressure, it is only through measurements that detection can be done. Although majority of patients with hypertension remain asymptomatic, some people with HTN report headaches, lightheadedness, vertigo, altered vision, or fainting episode (Singh S. et al, 2017).

Improper life-style and food habits, psychological stress factors with or without genetic predisposition provokes and vitiates all the three *Doshas* to trigger the pathogenesis of hypertension. Though modern science considers hypertension as a disease, from the *Ayurveda* point of view it should be understood as the *Prasaravastha* (preface) of all the *Doshas* along with *Rakta* which circulate all over the body (Akhilesh Shukla et al, 2018).

The holistic approach of Ayurveda in treating the patient as a whole - physical, psychological, and spiritual well-being helps alleviate lifestyle disorders (Yadav Uttamram et al, 2018). Health and diseases are dependent on three factors i.e., Ahara (Diet), Vihara (lifestyle practices) & Oushadha (Drug & therapies). Among these, food (Ahara) is considered the most important one. Pathya is defined as the ahara (diet) which is congenial to a person according to his constitution, appetite & digestive capacity of the body. One has to consume a diet, which is suitable to him in all aspects, and deviation from these may cause diseases. Classical texts of Ayurveda, knowing the role of diet as a causative as well as a curative agent in disease conditions (Raghavendra Naik et al, 2015).

According to Ayurvedic treatment for hypertension, eating meals regularly, but not overeating, not drinking water in between meals, not consuming meals whenever hungry but only at fixed intervals of time, not indulging in any other activities while eating, eating dinner before sunset and fasting once a month are considered as the pathya aahar for hypertension (R. K. Sharma et al, 2018). The consumption of lemon water, jowar, *purana* pumpkin, dried raisins, banana, anar, khand (sugar), *purana* gud, honey, buttermilk, parwal, fresh radish, ajwain, harad (turmeric), and dried ginger should be consumed. Consumption of meat, bakery products, papad and aachar, egg, and namkeen and farsan is to be avoided. These are considered as the pathya and apathya for aahar for hypertension (P. V. Sharma et al, 2006).

Aim: The aim of the study was to assess the pathya - apathya aahar and vihar status among individuals with hypertension in Mumbai.

METHODOLOGY

The proposed study was conducted using a cross-sectional study design. The study's target population was hypertensive patients aged 30-70 years receiving Ayurvedic treatment in Mumbai city. Ethical approval was sought from the ethical committee of K. G. Mittal Ayurveda College prior to the commencement of the study. The participants were recruited from the outpatient department of the K.G. Mittal Ayurvedic Hospital. The blood pressure was measured using a sphygmomanometer or a digital blood pressure machine.

The sampling was purposive or selective sampling as the participants had to be hypertensive individuals aged 30-70 years. The total number of participants in the study was 100. The duration of the study was 6 months.

Inclusion criteria:

- All sex (Males and females)
- Age group: 30-70 years
- Individuals diagnosed with hypertension (systolic blood pressure >140 mm of Hg and diastolic blood pressure >90 mm of Hg) following Ayurvedic treatment
- Individuals residing in Mumbai city

Exclusion criteria:

- Individuals with critical conditions (Recovering from surgery, to be undergoing surgery procedure in the next 2 months, ICU admitted patients, severe infectious diseases)
- Pregnant and lactating women

The sampling was purposive or selective sampling as the participants had to be hypertensive individuals of the age 30-70 years. The objectives of the study were evaluated and the sample size estimation was calculated to be of 100. The total number of participants in the study was 100. The duration of the study was 6 months.

Instruments/ tools: A general questionnaire including their age, gender, family type (and no. of members), occupation was administered. Anthropometric measurements are used to assess the size, and proportions of the human body. The height, weight, waist circumference and hip circumference of each participant were measured. A prakruti assessment form was administered to the participants to assess the nature of their prakruti. A 2-day dietary record form was administered to the participants to assess the participants' nutrient intake, portion size, meal patterns, and their eating habits. The dietary recall was taken for one weekday and one day of the weekend. Food frequency questionnaires (FFQs) are designed to assess habitual diet by asking about the frequency with which food items or specific food groups are consumed over a reference period. The assessment of dietary behavior patterns was done using a validated Food Frequency Questionnaire (FFQ). Self-developed questionnaire for food habits and lifestyle (sleep, physical activity and yoga) was administered to the participants. Sleep, physical activity and yoga affect the disease severity in the individual. The sleep questionnaire was a modified version of the Pittsburgh Sleep Quality Index Questionnaire and yoga questionnaire included the frequency of yoga asanas done in the past month. The physical activity questionnaire included questions about the time and duration of walks and performance of intense physical activities.

Statistical analysis:

Data was analysed using spss version 20. Categorical variables were described using frequency and expressed as N. The association between categorical variables were assessed using chi square test. Anova and student T test were used to predict the association of prakriti and pathya apathya among the hypertensive individuals. Significance for all the statistical measure was determined at 0.05 level.

For pathya and apathya aahar and vihar principles

For the descriptive data of food frequency and yoga practice frequency data pathya and apathya principles results are analyzed as: the daily, 5-6 times a week, and 2-4 times a week results are considered as pathya and the rest, once a week, 1-3 times a month and, never or less than a month are considered as apathya. For the descriptive data of pathya and apathya principles results are analyzed by calculating the percentage of pathya, apathya and sometimes category results.

Research Through Innovation

RESULTS

Table 1. General characteristics of participants

Variable	Males (N=38)		Females (N=61)		Total (N=100)	
	Mean	SD	Mean	SD	Mean	SD
Age. (in years)	58.8	7.0	58.3	7.2	58.5	7.1
Weight (kg)	75.7	10.7	70.7	15.5	72.7	13.9
Height (m)	2.0	0.0	4.5	19.9	3.5	15.5
BMI (kg/m ²)	28.3	3.5	28.8	6.5	28.6	5.5
Waist circumference (cm)	108.3	17.0	101.4	13.7	104.1	15.4
Hip circumference (cm)	98.7	14.2	107.3	14.9	104.0	15.1
Systolic blood pressure (in mm Hg)	144.2	17.1	145.4	17.5	144.9	17.2
Diastolic blood pressure (in mm Hg)	88.4	7.9	86.9	9.5	87.5	8.9
Energy (kcal)	1176.3	211.3	1189.8	262.7	1184.6	242.9
Protein (g)	37.8	11.9	36.4	12.3	37.0	12.1
Carbohydrates (g)	147.4	29.9	154.5	37.1	151.7	34.5
Fat (g)	49.8	13.6	48.1	12.3	48.8	12.8
Total fiber (g)	20.5	7.1	21.2	7.6	20.9	7.4
Dietary sodium (mg)	11738.8	7279.5	11739.9	6761.5	13104.9	183.3
Dietary potassium (mg)	1514.9	533.8	1580.7	488.4	1547.8	505.0

All data are mean (SD) of participants; Abbreviations: BMI, body mass index.

A total of 100 respondents participated in this study, including 39 males and 61 females. They were aged between 30-70 years with a mean age of 58.5(±7.07) years and an average BMI of 28.64 (±5.5) kg/m². (Table 1) The mean waist circumference of the participants was 104.1(±15.4) cm and hip circumference was 104 (±15.1) cm. The systolic blood pressure and diastolic blood pressure were similar in both males and females, 144.2(±17.1) mm Hg and 145.4(±17.5) and 88.4(±9.7) and 86.9(±9.5) mm Hg respectively. The mean dietary recall energy was found to be 1184.6(±242.9) kcal/ day. The mean macronutrient consumption included the mean consumption of carbohydrates of 151.7(±34.5) g/ day, protein of 37(±12.1) g/ day, and fat of 48.8(±12.8) g/ day. The mean consumption of total fibre was 20.9(±7.4), the mean sodium of 13104.9(±183.3) g/day, and potassium of 1547.8(±505.0) g/day.

Table 2. Symptoms first experienced in the participants

Symptoms experienced when first diagnosed with hypertension	Frequency	Percent (%)
Excessive perspiration	50	21.4
Headache	57	24.5
Palpitations	40	17.2
Chest pain	5	2.1
Fatigue	34	14.6
Confusion	23	9.9
Breathing dyspnea	12	5.2
Insomnia	2	0.9
Vision changes	9	3.9
Swelling of feet	1	0.4

Table 2 shows the frequency and percent of symptoms experienced by the participants when first diagnosed with hypertension. Headache (24.5%), excessive perspiration (21.4%) and palpitation (17.2%) were the most experienced symptoms in all the participants.

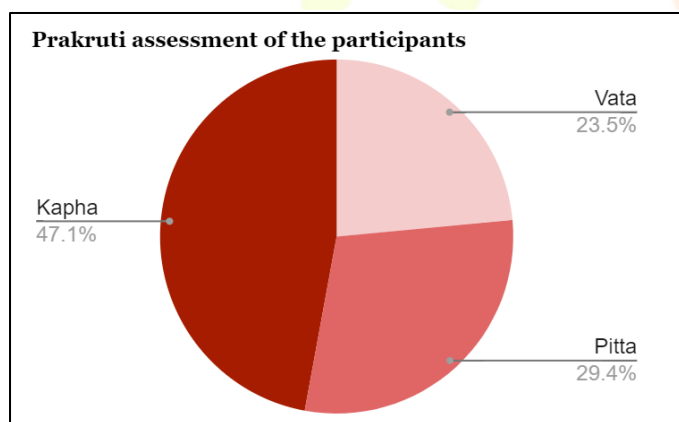


Fig. 1 Prakruti assessment of the participants

Fig. 1 shows the prakruti of the participants based on the various characteristics of the body. At mean, all the participants were 47.1% of kapha prakruti and 29.4% of pitta prakruti and 23.5% of vata prakruti.

Table 3. Descriptive data for aahar and vihar based on pathya and apathya for hypertensive individuals

Variables	Pathya	Apathya	Sometimes
Aahar (Dietary habits)	39.6%	49.9%	10.5%
Vihar (Sleeping habits)	40.5%	37.8%	21.7%
Vihar (Physical activity)	11.8%	85.2%	3%

Table 3 shows that 49.9% of the participants follow apathya dietary habits and 10.5% of the participants sometimes follow pathya dietary habits. 40.5% of the participants follow pathya principles for sleeping habits and 21.7% of the participants sometimes follow the pathya principles. 85.2% of the participants follow apathya vihar physical activities principles and 3% of the participants sometimes follow pathya vihar principles.

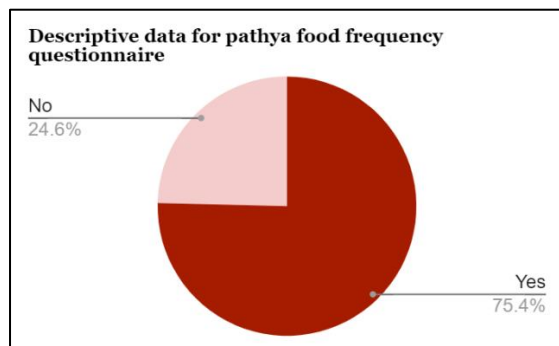


Fig 2. a. Descriptive data for pathya food frequency questionnaire

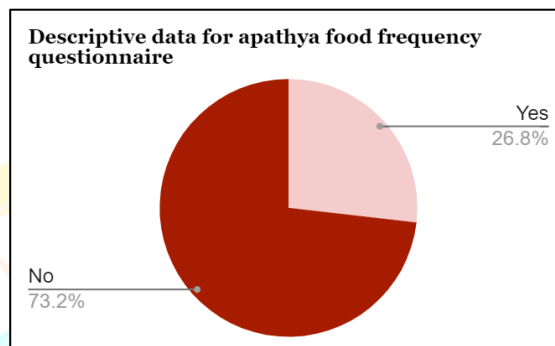


Fig 2. b. Descriptive data for apathya food frequency questionnaire

The food frequency figures for pathya foods for hypertensive individuals according to Ayurveda (Fig 2. a.), shows that 75.3% of the participants are following the pathya aahar. Fig 2. b. shows the apathya foods for hypertensive individuals according to Ayurvedic principles, 73.2% of participants are eating the apathya food items. The participants are consuming both pathya and apathya aahar.

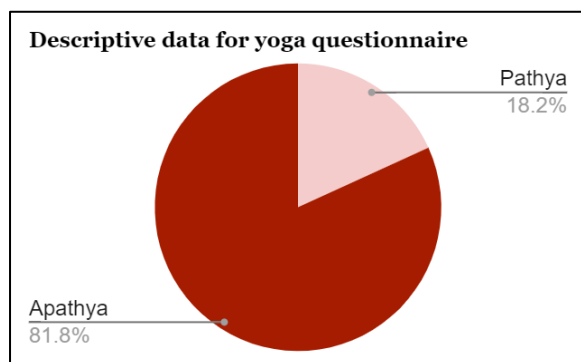


Fig 3. Descriptive data for yoga questionnaire

The frequency figure for yoga asanas for hypertensive individuals according to Ayurveda (Fig. 3), shows that 81.8% of the participants were not following pathya, that is, the yoga asanas and only 18.2% of the participants were practising the yoga asanas.

Table 4.a. Correlation between symptomatic relief and aahar (dietary habits) pathya and apathya based on Ayurvedic principles

Dietary habits	Symptomatic relief						x2	p-value
	0-5			6-10				
	P	A	S	P	A	S		
Regularly skipping meals	27	11	5	42	10	5	1.375a	0.503
Regularly overeating	36	2	5	56	0	1	7.196a	0.027
Drinking water in between meals	20	20	3	18	28	11	4.131a	0.127
Consuming meals whenever hungry	24	9	10	38	12	7	2.202a	0.332
Consuming meals at fixed intervals	36	5	2	54	1	2	4.393a	0.111
Indulging in other activities while eating	20	16	7	17	27	13	2.955a	0.228
Eating dinner before sunset	3	40	0	1	55	1	2.457a	0.293
Fasting at least once a month	1	37	5	6	44	7	2.601a	0.272

Abbreviations: P= pathya, A =apathya, S=sometimes

Table 4.b. Correlation between symptomatic relief and vihar (sleeping habits) pathya and apathya based on Ayurvedic principles

Sleeping habits	Symptomatic relief						x2	p-value
	0-5			6-10				
	P	A	S	P	A	S		
Trouble falling asleep/ falling asleep after waking up	9	27	7	10	38	9	0.208a	0.901
Sleeping immediately after meals	36	1	6	49	3	5	1.142a	0.565
Sleeping during the day	17	15	11	12	26	19	4.066a	0.131
Sleeping after eating lunch	17	15	11	12	26	19	4.066a	0.131

Abbreviations: P= pathya, A =apathya, S=sometimes

Table 4.c. Correlation between symptomatic relief and vihar (physical activity) pathya and apanya based on Ayurvedic principles

Physical activity	Symptomatic relief						x2	p-value
	0-5			6-10				
	P	A	S	P	A	S		
Indulging in intense activities immediately after eating meals	42	1	0	57	0	0	1.339a	0.247
Walking after waking up in the morning	9	33	1	15	35	7	4.181a	0.124
Walking after eating dinner	11	31	1	10	45	2	1.020a	0.601
Yoga	1	42	0	0	56	1	2.081a	0.353

Abbreviations: P= pathya, A =apathya, S=sometimes

Table 4a., b. and c. show the correlation between symptomatic relief and aahar and vihar pathya and apanya based on ayurvedic principles. Table 5 a. shows that a higher symptomatic relief (Score 6-10) is correlated with not regularly overeating than participants who overate regularly (score 1-5) (p value 0.027). table 5 a. shows that other aahar (dietary practices) and symptomatic relief did not have any statistical significance. Table 4 b. and c. do not show any significant correlations with symptomatic relief and vihar (sleeping habits and physical activity).

DISCUSSION

The findings of this study show that the mean BMI of all the participants was 28.64 ± 5.5 kg/m² which falls in the overweight category according to the Asian Indian BMI classification. The mean systolic blood pressure of the participants was 144.9 ± 17.23 mm Hg and the mean diastolic blood pressure of the participants was 87.5 ± 8.91 mm Hg. According to the AHA Hypertension guidelines the mean classification for hypertension of the participants was grade 2. Many investigators have earlier reported significant positive correlation of body mass index with systolic and diastolic blood pressure (Shahbazzpour N. et al, 2003; Gus M et al, 2004). In a study, it was also observed that the mean values of all anthropometric indicators used were significantly higher in all the hypertensive participants than is in the normotensive population and the findings were similar to many other studies (Fang F et al, 2003; Doll S et al, 2003). In a north east Indian study, the cut-off value of BMI for both categories of Asian population and WHO international showed that there was a positive association between different BMI categories and blood pressure (BP) (WHO Expert Consultation, 2014).

The most reported symptoms by the participants in the study were headaches (25.1%), excessive perspiration (21.4%), palpitations (17.27%), and fatigue (9.87%) followed by confusion, exertion dyspnea, vision changes, chest pain, and swelling of feet. In a study determining the prevalence of symptoms attributed to hypertension, headaches and dizziness were the most prevalent symptoms (L Eckes et al 2007).

The results for pathya and apanya aahar (dietary habits) shows that 49.9% of the participants are following apanya principles and for vihar (sleeping habits) shows that 40.5% of the participants are following pathya principles and, for vihar (physical activity) 85.2% of the participants are following apanya principles. According to Ayurvedic texts, these principles include not overeating, regularly skipping meals, drinking water in between meals, sleeping immediately after eating meals and during the day, not going for walks in the morning and not practising yoga (R.K.Sharma et al 2018).

The study shows that the most prominent dosha present in all the hypertensive participants is Kapha followed by Pitta and Vata. This is in favor with researches that profess that the *Avarana* (occlusion of normal functioning) of *Vata Dosha* by *Pitta* and *Kapha* can be seen in the *Rasa-Rakta Dhathus*, which in turn hampers the functioning of the respective *Srotas* (micro-channels) of circulation (Maanasi Menon et al 2017).

80.8% of the participants of in this study do not practice yoga which is considered as apathya for hypertensive individuals. According to a study which conducted a short yoga program for the patients to practice at home showed a decline in diastolic blood pressure of 4.4 mmHg ($p < 0.05$) compared to the control group. This showed an antihypertensive effect, as well as a positive effect on self-rated quality of life compared to controls implying that simple yoga exercises may be useful as a supplementary blood pressure therapy. (Wolff et al, 2013)

The descriptive data for food frequency for this study shows that the participants are consuming both pathya and apathya food items. Apathya food items list as high salt foods - bakery products, papad, pickles, namkeen and farsans. In another study it was concluded that the adverse association of dietary sodium with BP is attenuated by other dietary constituents (Paul Elliott et al, 2018).

In this study, it was found that there is a positive correlation between regularly overeating and increase in symptoms of hypertension in the participants (p value 0.027). This could be attributed to the high calorie high fat meal consumption that leads to increase in the blood pressure and hence causing increase in the symptoms. Body weight and obesity, specifically visceral adiposity, are known to be independent risk factors for hypertension, and the lowering of these risk factors by calorie restriction can generally reduce blood pressure. Both randomised controlled trials (Ruggenti P. et al, 2017; Lic C. et al 2017) and non-randomised studies (Van S et al 2015; Raitakari et al 2014; Hong K et al 2005) of calorie have shown that it can lower systolic blood pressure, diastolic blood pressure and mean arterial pressure in male and female type 2 diabetics and non-diabetics compared to a standard diet.

CONCLUSION

It can be concluded that individuals with hypertension do not follow all the Ayurvedic pathya aahar (dietary habits) and vihar (sleeping habits, physical activity – walking and yoga) principles for hypertension. Therefore, the management of the blood pressure levels of the individuals could be attributed to the allopathic medications. However, larger, controlled studies are needed to confirm the antihypertensive effect of Ayurvedic principles for aahar and vihar.

Strengths

The strengths of the study include the following:

- The study is one of the first studies to analyze the holistic approach for hypertension through dietary and lifestyle habits of hypertensive individuals from an Ayurvedic and modern nutrition science perspective.

Limitations

The limitations of the study include the following:

- The sample size was small due to the restriction of time.
- The participants had other comorbidities along with hypertension which affected their prakruti and interfered with their pathya and apathya aahar and vihar status. The participants were taking ayurvedic medication for these comorbidities along with the allopathic hypertension medications.
- According to Ayurveda, hypertension can be treated with aahar and vihar pathya principles but due to difficulty with compliance because of the westernization and lifestyle changes to control the vast unattended blood pressure changes allopathic medications were prescribed to majority of the participants.

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