

## Food Preferences and Quantitative Aspects of Fruits, Vegetables and Pulse Consumption among Essential Hypertensive Subjects

### Abstract

Hypertension is a silent killer and precursor of all the metabolic disturbances. Although, people are getting aware about their health in developing countries like India, strict adherence to a healthy dietary approach is scarce even among diagnosed hypertensives. For the purpose of study 60 hypertensive male and female were selected from naturopathy center namely *Prakritik Jeevan Kendra, Pattikalyana, G.T. Road, Panipat and Navneet Prabhakar Yog Chikitsa Dham, Bassi, Jaipur, Rajasthan*. Dietary information was collected through a questionnaire cum interview method. Blood pressure measured at the time of joining Naturopathy Center. Most of the subjects were vegetarian (68.31%) and having salty taste preferences (60%) and involved in fasting and salad eating habits. Daily consumption frequency of fruits was least (31.65%) whereas it was higher for vegetables (66.64%) and pulses (63.31%). Contrary to it daily quantitative intake of fruits, vegetables and pulses was double among male hypertensives than the female subjects.

**Keywords:** Hypertension, Dietary Intake, Quantitative Aspects, Systolic Blood Pressure, Diastolic Blood Pressure etc.

### Introduction

Hypertension is a silent killer with the claim of hypertension is estimated to contribute 9.4 million deaths annually all over the world (Verma *et al.*, 2018). Once considered a problem of the Western world, cardiovascular diseases are rapidly spreading to developing nations (Rodgers *et al.*, 2002) and are responsible for about 40 per cent of deaths in developing countries. About 80 per cent of hypertensive patients have one or more risk factors like dyslipidemia, glucose intolerance, obesity and ventricular hypertrophy. The scientifically proven remedy for all the above explained phenomena is exercise, relaxation and other health promoting behaviors. Diet is one of the main modifiable risk factors in the development of hypertension. Rising rate of hypertension and other chronic diseases in developing countries have been attributed to the nutrition transition and global shifts in food consumption patterns (Nilofer *et al.*, 2015). The diet is comprised of numerous variety of foods. It envisages the research to select the healthiest option. Consumption of a diet loaded with all the nutrients is a thing of past. Presently there is a staunch need of an immunity booster diet rich in all phytonutrients and antioxidants and low in calories to decrease the severity of obesity, the epicenter of all the non-communicable life style disorders including diabetes, hypertension and joint pain to even cancer. Fruits, vegetables and pulses are the best suited for the obese hypertensive subjects, as they are rich in many phytonutrients as well as vitamins, minerals, dietary fibre, electrolytes and protein (Slavin and Lloyd 2012). WHO and Food and Agriculture reports of United Nations too recommend five servings of fruits and vegetables in a day (Pem and Jeewon, 2015). Many studies have been conducted to find the association between the diet and hypertension but there are few studies to know the actual diet habit of the people after diagnosis of hypertension. (Devi *et al.*, 2014). The present study is an effort to understand the natural dietary habits of health conscious hypertensive subjects having strong belief in non-pharmacological approaches of treating hypertension.



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## Materials and Methods

### Sampling

By purposive sampling technique, 30 hypertensive male and equal number of hypertensive female who enrolled themselves in naturopathy centers for the treatment of hypertension.

### Location

Subjects were selected from naturopathy centers namely-Prakritik Jeevan Kendra, Pattikalyana, G.T. Road, Panipat and Navneet Prabhakar Yog Chikitsa Dham, Bassi, Jaipur, Rajasthan. The age of the subjects was between 40-60 years. This treatment was done in naturopathy centers for one month. In naturopathy centers subjects were doing yoga (i.e. exercise and pranayam). Along with this they were under going mud, water and diet therapies accordingly. They were given herbal tea, honeyamla water or bottle guard juice to drink in fasting state according to their adjacent complications.

### Collection of General Information

#### General Information of the Subjects was collected by Pretested Questionnaire

Before commencing the experimental trial at naturopathy center the general information regarding essential hypertension was collected including dietary habits and personal habits by questionnaire cum interview method. Preliminary prepared performa was carried out on 10 subjects to test the reliability and validity of these performa and modified one was used to collect the desired data related to the dietary habits like meal consumption pattern as well as fat, salad and milk consumption habits, name of the naturopathy center in which they have enrolled.

### Measurement of Blood pressure

Blood pressure was measured on left arm by auscultatory method using mercury sphygmomamo meter. The individual was made comfortable and seated at least for five minutes in the chair before measurement. Two readings were taken half an hour apart and the average of two was taken (WHO, 2004). Hypertension was defined as systolic blood pressure (SBP) >140 mm Hg and diastolic blood pressure (DBP) >90 mmHg as per US Seventh Joint National

Committee on detection, evaluation and treatment of hypertension (JNC VII) criteria (2003).

### Statistical Analysis

Data for blood pressure was statistically analysed to calculate the mean and S.D.

## Results and Discussion

### Hypertensive state of the Subjects

All the subjects under study were diagnosed hypertensives as per the criteria of Joint National Committee (2003) with the mean SBP (Systolic Blood Pressure) of 162.51 mm Hg and DBP (Diastolic Blood Pressure) of 105.49 mm Hg as revealed in the Table 1.

**Table 1: Blood Pressure (Mean + S.D.) of the Hypertensive Human Subjects at Joining Naturopathic Treatment**

Parameters	Blood Pressure (mm Hg) (Mean + S.D.)
<b>SBP (Systolic Blood Pressure)</b>	157.20+ 19.86
Male (n=30)	166.99 + 23.83
Female (n=30)	162.51+ 22.27
Total (N=60)	
<b>DBP (Diastolic Blood Pressure)</b>	106.29+ 15.20
Male (n=30)	104.81+ 11.62
Female (n=30)	105.49+ 13.25
Total (N=60)	

### Food Choice of the Essential Hypertensive Subjects

Most of the subjects were vegetarian (68.31%), involved in nibbling in between the meals (80%), having salty taste preferences (60%) and involved in fasting and salad eating habits.

### Salt Eating Habits of the Essential Hypertensive Subjects

#### Salt Bought Per Month

Salt bought per month in the family used to depict their earlier salt eating habits in which 70 per cent reported to consume more than 500 gm of salt followed by those who took more than 1 kg (5%). One third of total subjects quoted to purchase 500 gm of salt for the complete family (Table 2)

#### Intake of Extra Table Salt

Out of 60 selected hypertensive subjects, only five per cent were using extra table salt. (Figure 2)

**Table 2: Salt Eating Habits of the Essential Hypertensive Subjects**

Salt Eating Habits	Male (n=30)		Female(n=30)		Total(N=60)	
	No. of Subjects	% Age	No. of Subjects	% Age	No. of Subjects	% Age
<b>a.Salt Bought Per Month</b>						
1. >1Kg	2	6.66	1	3.33	3	5
2. 500 gm	8	26.66	7	11.67	15	25
3. < 500 gm	20	66.66	22	96.66	42	70
<b>b.Intake of Extra Table Salt</b>						
1. Yes	1	3.33	2	6.66	3	5
2. No	29	96.66	28	93.32	57	95

### Food choice of Essential Hypertensive Subjects

#### Fruit Choice

From table 3, it is found that mango was the hot favorite (63.31%) among the selected all essential

hypertensive subjects followed by grapes (16.66%), orange (10%), banana (5%), any other (3.33%) and pomegranate was the least preferred ones being liked by single female subject only.

### Vegetable Choice

Major chunk (41.65%) of subjects relish taking potato vegetable followed by lady's finger (30%) and bottle guard (13.33%). An equal number (10%) of subjects liked to take pumpkin and colocasia.

### Pulse Choice

The most popular pulse was chhole (26.66%) among all essential hypertensive subjects followed by Bengal gram (15%). Rajmah (13.33%) and any other pulse was liked by only single female subject. Paneer was relished by 43.32 per cent of subjects.

**Table 3: Food Choice of Essential Hypertensive Subjects**

Food Choice	Male (N=30)		Female(n=30)		Total(N=60)	
	No. of Subjects	% Age	No. of Subjects	% Age	No. of Subjects	% Age
<b>a. Fruit choice</b>						
1. Mango	20	66.66	18	60	38	63.31
2. Banana	2	6.66	1	3.33	3	5
3. Orange	--	--	6	6.66	6	10
4. Pomegranate	--	--	1	3.33	1	1.66
5. Grapes	6	20	4	13.33	10	16.66
6. Any other	2	6.66	--	--	2	3.33
<b>b. Vegetable choice</b>						
1. Pumpkin	4	13.33	2	6.66	6	10
2. Bottleguard	2	6.66	6	20	8	13.33
3. Lady's finger	8	26.66	10	33.33	18	30
4. Colocasia	1	3.33	2	6.66	3	10
5. Potato	15	50	10	33.33	25	41.65
<b>c. Pulse choice</b>						
1. Chhole	9	30	7	23.33	16	26.66
2. Rajmah	5	16.67	3	10	8	13.33
3. Paneer	8	26.66	18	60	26	43.32
4. Bengal Gram	7	23.33	2	6.66	9	15
5. Any other pulse	1	3.33	--	--	1	1.66

### Food Item Consumption Frequency of Essential Hypertensive Subjects

#### Frequency of Fruit Consumption

Out of total 60 essential hypertensive subjects 31.65 per cent were taking fruits twice daily and 30 per cent of the subjects were having fruits daily, 20 per cent subjects were taking fruits weekly and only 18.33 per cent were taking fruits twice weekly (Figure 1).

#### Frequency of Vegetable Consumption

In the case of vegetables, out of total 60 essential hypertensive subjects 66.64 per cent were taking vegetables daily and 31.65 per cent of the subjects were having twice daily and only one male

subject and none of the females was having vegetables twice weekly. None of the subject reported to take vegetables weekly. Surprisingly, all of the female were having vegetables either daily (70%) or twice daily (30%). So, the vegetable consumption pattern of female subjects was found to be more regular as compared to their male counter parts (Figure 3).

#### Frequency of Pulse Consumption

Out of total 60 essential hypertensive subjects, 63.31 per cent were taking pulses daily and 20 per cent were having pulses twice daily, 5 per cent weekly and 11.66 per cent were having them twice weekly (Figure 4).

**Table 4: Distribution of the Essential Hypertensive Subjects on the Basis of Frequency of Food Item Consumption**

Frequency	Male (n=30)		Female (n=30)		Total (N=60)	
	No. of Subjects	% Age	No. of Subjects	% Age	No. of Subjects	% Age
<b>a. Frequency of fruit consumption</b>						
1. Twice daily	12	40	7	23.33	19	31.65
2. Daily	10	33.33	8	26.66	18	30
3. Weekly	2	6.66	10	33.33	12	20
4. Twice weekly	6	20	5	16.67	11	18.33
<b>b. Frequency of vegetable consumption</b>						
1. Twice daily	10	33.33	9	30	19	31.65
2. Daily	19	63.33	21	70	40	66.64
3. Weekly	--	--	--	--	--	--
4. Twice weekly	1	3.33	--	--	1	1.66
<b>c. Frequency of pulse consumption</b>						
1. Twice daily	5	16.67	7	23.33	12	20
2. Daily	20	66.66	18	60	38	63.31
3. Weekly	2	6.66	1	3.33	3	5

4. Twice weekly	3	10	4	13.33	7	11.66
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**Mean Amount of Food Item Consumed By the Hypertensive Subjects**  
**Mean intake of fruits**

The mean intake of fruits by male, female and total population comprising of both male and female was 350± 37, 180±28 and 265±32.5 g/day respectively. Thus, the adequacy of fruits was 350, 180 and 265 per cent respectively of the recommended ICMR intake of 100 g/day. Which showed more than triple amount of fruit intake for male essential hypertensive subjects and was surplus for female as well as total population.

**Mean Intake of Vegetables**

The mean intake of vegetables by male, female and total population comprising of both male and female was 250± 30, 90±19 and 170± 24.5 g/day, respectively. Thus the adequacy of vegetables was

250, 90 and 170 per cent respectively of the recommended ICMR intake of 100 g/day, which showed two and a half times of vegetable intake for male subjects, inadequate for female, but the intake was higher than that of the recommended intake for the over all population.

**Mean in Take of Pulses**

The mean in take of pulses by male, female and total population comprising of both male and female was 60± 20, 30±12 and 45±16 g/day, respectively and the adequacy of pulses intake was 100, 50 and 75 per cent respectively of the recommended ICMR intake of 60 g/day. The intake is adequate for male, half of the recommended intake for female and less than recommendations for total population.

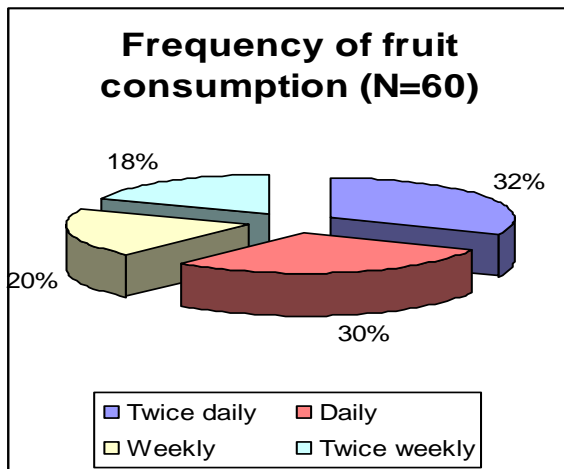
**Table 5: Mean Amount of Food Item Consumed by The Hypertensive Subjects**

Amount of food item (g s)	Mean quantity of food stuff consumed (g /day)		
	Male (n=30)	Female (n=30)	Total (N=60)
1. Fruit	350 ± 37	180± 28	265 ± 32.5
2. Vegetable	250 ± 30	90 ± 19	170 ±24.5
3. Pulse	60 ± 20	30 ±12	45 ± 16

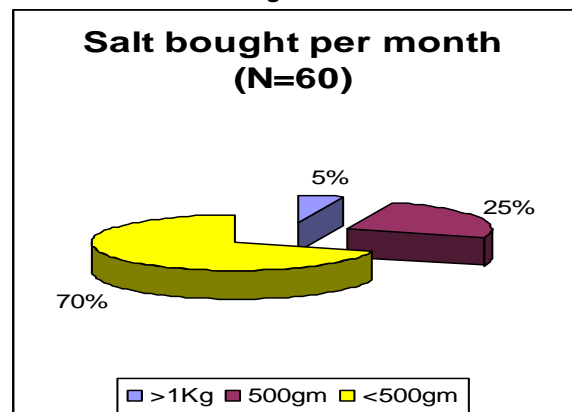
**Conclusion**

It has been summed up from the given survey that male subjects were taking sufficient fruits, vegetables and pulses but female were taking less vegetables and pulses. Contrast to it, the consumption of pulses was low among all the combined subjects. Subjects were having fruits and vegetables one or the other time in most of the cases, but not at every meal time which is desirable. Moreover, the frequency of pulse consumption is satisfactory with no sizeable difference in the consumption pattern between male and female subjects. Results of the study reveals that the diet quality of female is poorer to the male subjects so nutrition education and awareness is required to be dispersed among them.

**Figure 1**



**Figure 2**



**Figure 3**

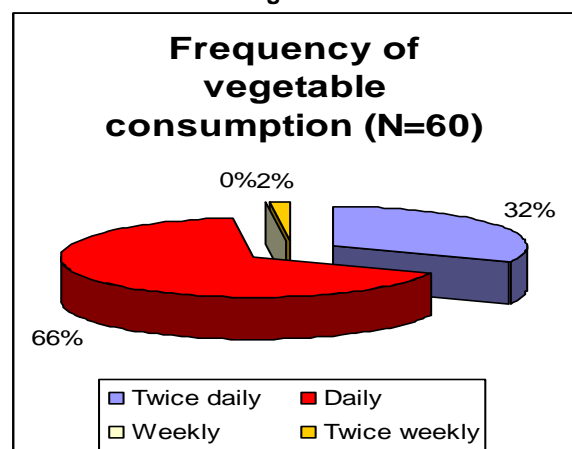
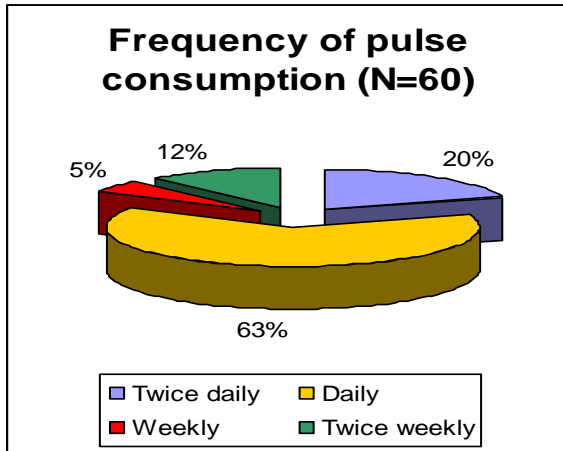


Figure 4



### References

1. Slavin JI and Lloyd B (2012). Health Benefits of Fruits and Vegetables. *Adv. Nutr*, 3(4):506-16
2. Food and Agriculture Organisation (2013). Challenges and issues in Nutrition Education education. <http://www.fao.org/docrep/017/i3234e/i3234e.pdf>
3. World Health Organisation (2014) Obesity and Overweight. Fact sheet no. 311. Available from <http://www.who.int/mediacentre/factsheets/fs311/en/>
4. ICMR(2011) Dietary Guidelines for Indians-A Manual , 2<sup>nd</sup> Edition, NIN, Hyderabad. pp 10, 86-90,92
5. WHO (2015) Global report on trends in prevalence of tobacco smoking 2015, Geneva
6. <http://www.nhlbi.nih.gov/guidelines/hypertension/express.pdf>. 15/11/2003 JNC VII Express (2003) Prevention, detection, evaluation and treatment of high blood pressure
7. James WPT, Anna Ferro-Lyzzzi, Waterlow JC (1988) Definition of chronic energy deficiency in adults- report of working party of intervention dietary energy consultation group. *Am J Clin Nutr*. 42 : 969-981.
8. Jelliffe DB (1966) The assessment of the nutritional status of the community. World Health Organisation (Monograph Series No. 53).
9. WHO (2004) Luepker RV, Evans A, Mc Keigue P, Reddy KS (2004) Cardiovascular Survey Methods (3<sup>rd</sup>ed) Geneva. p 147
10. Cheah SF, Azizah O, Azli R (2003) Comparative study of antioxidant vitamins and total polyphenol contents and antioxidant activity in green vegetables grown organically and conventionally. Proceedings of the IX Asian Cong Nutr, New Delhi. p 154.
11. <http://www.mayoclinic.com/health/fiber/ NU00033> 2/11/2008 Dietary fiber: An essential part of a healthy diet (2008)