



Efficacy of Supplementation of Kiwi Fruit Juice on Selected Hypertensive Adult Patients of Suchindrum in Kanniyakumari District

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Abstract: Fruits consist mainly of carbohydrates and are known to have high nutritional values specifically in terms of micronutrients. Studies have shown that high intake of fruits and vegetables may have a protective effect against hypertension. Phytochemicals in plant reduces the risk of developing many diseases including heart diseases, hypertension, cataracts, osteoporosis and urinary tract infections. In this study Sample of 60 subjects within the age 28 to 35 years were selected for the study, to assess their frequency of fruit consumption pattern, awareness about phytochemicals in fruits, clinical assessment and effect of supplementation of kiwi juices. Out of these, 10 (05 Males & 05 Females) samples were chosen as experimental group and 10 (05 Males & 05 Females) samples were treated as control group. Evaluation was carried out by comparing the results before and after the supplementation of kiwi fruit juices for one month and results were statistically analysed. The study finally revealed that subjects who consumed kiwi fruit juices had a tremendous improvement in reducing their blood pressure levels when comparing with the control group.

Keywords: Phytochemicals, Supplementation, Hypertension, Kiwi Juices, Clinical Assessment

I. INTRODUCTION

India is the second largest producer of fruits in the world, because its diverse agro-climatic conditions allow a wide range of tropical, sub-tropical and a temperature fruit to be produced.

Fruit production in India covers an area of 4.96 million hectares (Agricultural Extension, 2004). There is convolving evidence that consumption of fruits and vegetables decrease the risk of cardiovascular disease, hypertension, obesity and diabetes (WHO, 2003). Kiwifruit is one of the most commercialized fruits on the international market, which has notable high nutritional and medicinal value with many health benefits (Ma, 2019). Kiwi fruit or Chinese gooseberries are the edible berries of several species of woody vines in the genus *Actinidia*. Kiwi fruit is oval in shape, greenish brown in colour, it has little sweet and bitter taste. It has many health benefits like it helps in digestion, boosts our immunity, and maintains blood pressure (Tyagi & Sahay, 2015). The qualitative phytochemical analysis of the extracts revealed the presence of alkaloids, flavonoids,

saponins, cardiac glycosides, tannins and terpenoids in whole fruit of *Actinidia deliciosa* (Soham et al., 2020).

Kiwifruit are exceptionally high in vitamin C and contain an array of other nutrients, notably nutritionally relevant levels of dietary fibre, potassium, vitamin E and folate, as well as various bioactive components, including a wide range of antioxidants, phytonutrients and enzymes, that act to provide functional and metabolic benefits. (Richardson et al., 2018).

In the light of the above facts realizing the significance of fruits and its role in hypertension, concerns were undertaken in this study with the following objects:

1. To assess the frequency of fruit consumption pattern of the subjects.
2. To assess the level of knowledge about phytochemicals in fruits.
3. To assess the clinical status of the subjects
4. To evaluate the effect of supplementation of kiwi fruit juices among hypertensive patients



II. METHODOLOGY

Materials

Raw materials needed for the study

Raw materials needed for the study were kiwi fruits, milk, sugar, and raisins.

Identification of raw materials

Samples were identified with the help of a botanist

Procurement of samples

The samples needed for the study were purchased from big bazaar near Nagercoil, about 6 kilograms for a week, washed in running water, cleaned and stored in refrigerated conditions.

Equipment used for the study

Equipment and instruments used for this study was glass wares, strainers, blender, and mixer and sphygmomanometer.

III. METHODS

Selection of the area

Suchindrum situated in Kanniyakumari District were selected for the conduct of the study. This area was selected because of the willingness and the co-operation rendered by the subjects, more over most of the subjects were well known to the investigator.

Selection of the subjects

Samples of 60 subjects within the age 28 to 35 years were selected for the study, to assess their frequency of fruit consumption, awareness about phytochemicals in fruits, clinical assessment and effect of supplementation of kiwi juices. Among these subjects 30 were males and 30 were females. Among them 15 males and 15 females who suffered from high blood pressure were selected for the study. Out of these samples 10 (05 males & 05 Females) were chosen as the experimental group and 10 (05 males & 05 Females) were treated as control group.

Formulation of the tool

A well framed questionnaire was formulated to know their general information like name, sex, age, numbers of members in the family, occupation and income etc. The first part of the questionnaire included frequency of fruit consumption pattern. The second part of the questionnaire included questions on awareness on phytochemicals in fruits. The third part of the questionnaire includes clinical examination.

CONDUCT OF THE STUDY

Procedure for the preparation of kiwi fruit juices

Flow Chart indicating kiwi fruit juice Preparation

50 grams of fresh Kiwi fruit were selected

↓
Washing, cleaning in running water to avoid dust

↓
After washing, Kiwi fruits are cut in to small pieces

↓
After cutting, place it in a bowl, add milk, sugar and water about 150 ml

↓
put it in a blender and mix well

↓
Add raisins

↓
Serve chill

Supplementation of kiwi juice

Fruit juices prepared from kiwi fruit were supplemented for about 200 ml on daily basis for continuous one month.

Measurement of blood pressure

Blood pressure is recorded by sphygmomanometer. Blood pressures were recorded in data sheet daily by the investigator initially and finally before and after supplementation.

Evaluation

Evaluation was carried out by comparing the results before and after the supplementation

Analysis of data

The collected data was analyzed under student's t test using software and statistically interpreted. The data were statistically analyzed by graph pad software statistical packages. The results statistical differences between groups were performed using T Test. Difference considered significantly when $P < 0.0001$.



IV. RESULTS AND DISCUSSION

Frequency of fruit consumption

Table No 1: Frequency of Fruit Consumption

Particulars	Frequency of Fruit Consumption
Daily	Nil
Once in a week	Banana, Sapota, Grapes
Occasionally	Apples and oranges
None	Straw Berry, Kiwi, Rambhutan

It is clearly understood that fruits were not consumed by the subjects every day. Among these Bananas, Sapota, Guava, and Grapes, were taken and preferred by most of the people once in a week. Apples, Orange and Pomegranates and oranges are taken occasionally. None of the selected subjects used Rambhutan, Straw berry and Kiwi fruit due to its cost and seasonal availability.

Awareness about phytochemicals in Fruits

Table No 2: Awareness about phytochemicals in fruits

Awareness of phytochemical in fruits	Total (n=60)	
	No	%
Yes	08	13.33
No	52	86.66
Total	60	100

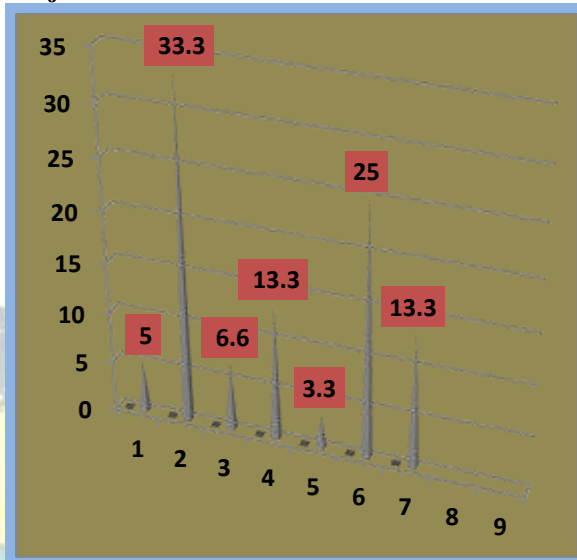
The survey findings revealed that most subjects (86.66 Per Cent) are not aware about knowledge of phytochemical in fruits and their health significance. The major reasons were most people were illiterate. Only a

S. N	Group	Before Intervention (N= 10)		After Intervention (N= 10)		T value
		M	SD	M	SD	
1	Control	142.45	5.98	146.89	1.456	6.8899 *NS
2	Experimental	137.70	4.99	133.50	3.19	2.8285 **S

few (13.33 per cent) of subjects know the importance of phytochemicals.

Clinical Assessment of the Subjects

Fig No 1: Clinical Assessment of the Subjects



With the help of a physician under bright illumination clinical assessment were carried out. Blood samples and other test mode were done with the help of a laboratory expert and results were drawn. From figure no 1, it is evident that 05 per cent of subjects suffered from jaundice, 33.3 per cent hypertension, anemia 06.6 per cent, asthma 13.3 per cent, Tuberculosis, 03.3 per cent, diabetes 25 per cent, followed by obesity 13.3 per cent.

Effect of Supplementation of Kiwi Juice on Selected subjects

Table No 3: Effect of Supplementation of Kiwi Juice on Selected Subjects

*Not significant **Significant

From the table no 3, it was clearly evaluated that when administering kiwi juices to the experimental group, their systole and diastole level becomes normal and showed a tremendous improvement, but in control group it remains same. This may be the reasons that kiwi possess rich antioxidants like carotenes, luteins and xanthophyll and potassium in lowering the blood pressure levels.

V. SUMMARY

The present study were summarized and concluded as follows, the age of the selected subjects was between 28-35years. Fruits were not included daily in the diets of all subjects. None of the selected subjects took fruit juices daily. Some of the selected subjects didn't



consume any fruits juices in their diet due to dislikes and poverty. Kiwi fruit juices were supplemented regularly for one month and recorded before and after study. Improvement was observed in subjects who consumed kiwi fruit juices daily.

REFERENCES

- [1]. Agricultural Extension 2004. Statistics Report of Fruit Production. Department of Agricultural Extension, Bangkok Thailand.
- [2]. Ma, T., Lan, T., Geng, T., Ju, Y., Cheng, G., Que, Z., Gao, G., Fang, Y., & Sun, X. (2019). Nutritional properties and biological activities of kiwifruit and kiwifruit products under simulated gastrointestinal digestion. *Food & Nutrition Research*, 63. <https://doi.org/10.29219/fnr.v63.1674>
- [3]. Richardson, D.P., Ansell, J. & Drummond, L.N. The nutritional and health attributes of kiwifruit: a review. *Eur J Nutr* **57**, 2659–2676 (2018). <https://doi.org/10.1007/s00394-018-1627-z>
- [4]. Soham S. Mulye et al., Medicinal and Phytochemical Analysis of Alcoholic Whole Fruit Extracts of *Actinidia Deliciosa*. *Journal of Scientific Research Institute of Science*, Banaras Hindu University, Varanasi, India. Volume 64, Issue 1, 2020
- [5]. Tyagi. S., Nanher, A.H., & Sahay, S. (2015). Kiwi fruit: Health benefits and medicinal importance. *Rashtriya krishi*, 10(2): 98-100
- [6]. WHO, World Health Report 2003; Shaping the Future. Geneva Switzerland. World Health Organization; 2003.
- [7]. Soham S. Mulye et al., Medicinal and Phytochemical Analysis of Alcoholic Whole Fruit Extracts of *Actinidia Deliciosa*. *Journal of Scientific Research Institute of Science*, Banaras Hindu University, Varanasi, India. Volume 64, Issue 1, 2020
- [8]. Tyagi. S., Nanher, A.H., & Sahay, S. (2015). Kiwi fruit: Health benefits and medicinal importance. *Rashtriya krishi*, 10(2): 98-100
- [9]. WHO, World Health Report 2003; Shaping the Future. Geneva Switzerland. World Health Organization; 2003.

BIOGRAPHY



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