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Effectiveness of watermelon extract in reduction of blood pressure among hypertensive clients in selected villages

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Abstract
The present study was to evaluate the effectiveness of watermelon extract in reduction of blood pressure among hypertensive clients in selected villages at Thiruvallur in Mappedu. A quantitative research approach and quasi experimental research design was adopted for in this study. In 60 hypertensive clients among which one group 30 experimental group and 30 is control group by using convenient sampling technique. A self structured questionnaire method was used. Experimental group received 200 ml of watermelon juice for 21 days. After intervention the experimental group value of post test 't' test value is 6.912 was found to be statistically significant at p greater than 0.001. Hence the findings of present study concluded that was significantly improvement in the post test level of blood pressure in the experimental group which clearly interferes that watermelon extract on blood pressure level was found to be effective in reducing the level of blood pressure among hypertensive clients.

Keywords: Watermelon, blood pressure, adults above 35 years

Introduction
Hypertension is an important public health challenge in both economically developing and developed countries [1]. An estimated 1.13 billion people worldwide have hypertension, most (two-thirds) living in low- and middle-income countries. In 2015, 1 in 4 men and 1 in 5 women had hypertension. Fewer than 1 in 5 people with hypertension have the problem under control. Hypertension is a major cause of premature death Worldwide [2]. A disease related to risky health behaviours, including smoking, poor diet, overweight and obesity, alcohol consumption, physical inactivity and occupational lifestyle [3]. Raised blood pressure is a major risk factor for chronic heart disease, stroke, and coronary heart disease [4]. Hypertension is often called 'the silent killer' because it shows no early symptoms [5]. Hypertension being a more complications such as, heart attack or stroke, heart failure, arterial fibrillation, left ventricular failure, atherosclerosis, aneurysm, renal damage, retinal damage, metabolic disorder, dementia [6]. The red and refreshing fruit that is loved by many is not only sweet and satisfying to eat, but it may offer some serious health benefits when it comes to blood pressure. Specifically, watermelon is one of the best foods to help support a healthy blood pressure because it's a naturally sweet treat that doesn't contain added sugars, and it is rich in three blood-pressure supporting nutrients: L-citrulline, lycopene and potassium [7]. Watermelon contains an amino acid called citrulline, which may help to manage high blood pressure. Citrulline helps the body to produce nitric oxide, a gas that relaxes blood vessels and encourages flexibility in arteries. These effects aid the flow of blood, which can lower high blood pressure [8]. So the main motive and aim of the present study was aim to assess the blood pressure among clients with hypertension both in experimental and control group in selected villages and evaluate the effectiveness of watermelon extract on blood pressure among clients with hypertension in selected villages and find associate between the level of blood pressure among clients with hypertension with their selected demographic variables comparison of post test level of blood pressure among hypertensive clients between the experimental and control group.

Methods and material
The quantitative research approach and quasi experimental research design was used in this study.

After getting a ethical clearance from the institutional Ethical committee (IEC) of Saveetha institute of Medical and Technical Sconces and a formal permission from the departmental head of community medicine. The population of the study sample included all above 35 years who were lived in Thiruvallur (Mappedu). The under study clients were diagnosed with hypertension by an clinical check up with blood pressure using a Sphygmomanometer and met criteria of the study. These criteria included hypertensive clients who are in the age group of 35 and above years; excluded are hypertensive clients who had any other co morbidities like diabetes, cardiovascular disease, etc. The samples size is 60; 30 for experimental group; another 30 is for control group in this study. Experimental group clients consume a 200 ml of watermelon juice. The e purpose of the study explained by the investigator to each participants and written informed consent was obtained from them. The demographic data and the exciting the level of hypertensive was collected by using self structured questionnaire and the collected data were tabulated and analyzed by using excremental and inferential statistics.

Results and discussion

Section-A: Demographic characteristics

Among 60 study participants with regards age 9 (30%)were in the age group of 50-60yrs, with regards sex male 13(43.3%), with regards religion majority of the Christian 10(33.3%) with regards education primary level11(36.7%), with regards occupation daily wages 11(36.7%) With regards dietary pattern non vegetarian 11(36.7%).

Section-B: To assess the blood pressure among clients with hypertension both in experimental and control group

The analysis revealed that in the pretest of experimental group, with respect to systolic BP 17(56.67%) had stage 1 hypertension, 9(30%) had stage 2 hypertension and 4(13.33%) pre-hypertension. Whereas in post test, 25(83.33%) had pre-hypertension and 5(16.67%) had stage 1 hypertension. With regard to diastolic BP in the pretest of experimental group, 16(53.33%) had stage 1 hypertension, 8(26.7%) had stage 2 hypertension, 4(13.33%) had pre-hypertension and 2(6.7%) were normal. Whereas in the post test, 20(66.67%) had pre-hypertension, 9(30%) had stage 1 hypertension and only 193.3%) was normal. (Table 1).

The analysis shows that in the pretest of control group, with respect to systolic BP 19(63.33%) had stage 1 hypertension and 11(36.67%) had stage 2 hypertension. Whereas in post test, 18(60%) had stage 1 hypertension, 10(33.33%) had stage 2 hypertension and 2(6.67%) had pre-hypertension. With regard to diastolic BP in the pretest of control group, 19(63.33%) had stage 1 hypertension and 11(36.67%) had stage 2 hypertension. Whereas in the post test, 21(70%) had stage 1 hypertension and 9(30%) had stage 2 hypertension.

The study supported is to Karen L McNiece, *et al*. (2007) had conducted a Prevalence of hypertension and pre-hypertension among adolescents. The Objective of the study is to determine the prevalence of hypertension and pre-hypertension on the basis of the 2004 National High Blood Pressure Education Program Working Group guidelines in an adolescent school-screening population. The study design was Cross-sectional assessment of blood pressure (BP) in 6790 adolescents (11-17 years) in Houston schools was conducted from 2003 to 2005. Results of the study, BP distribution at initial screen was 81.1% normal, 9.5% pre-hypertension, and 9.4% hypertension (8.4% Stage 1; 1% Stage 2). Prevalence after 3 screenings was 81.1% normal, 15.7% pre-hypertension, and 3.2% hypertension (2.6% Stage 1; 0.6% Stage 2) [9].

Table 1: Frequency and percentage distribution of level of blood pressure among hypertensive clients in the experimental group, N=60

Blood Pressure	Test	normal (<120)		Pre-hypertension (120 – 139)		Stage1Hypertension (140 – 159)		Stage 2 Hypertension (≥160)	
		No.	%	No.	%	No.	%	No.	%
Systolic BP	Pretest	0	0	4	13.33	17	56.67	9	30.0
	Post Test	0	0	25	83.33	5	16.67	0	0
Diastolic Bp	Pretest	2	6.7	4	13.33	16	53.33	8	26.7
	Post Test	1	3.3	20	66.67	9	30.0	0	0

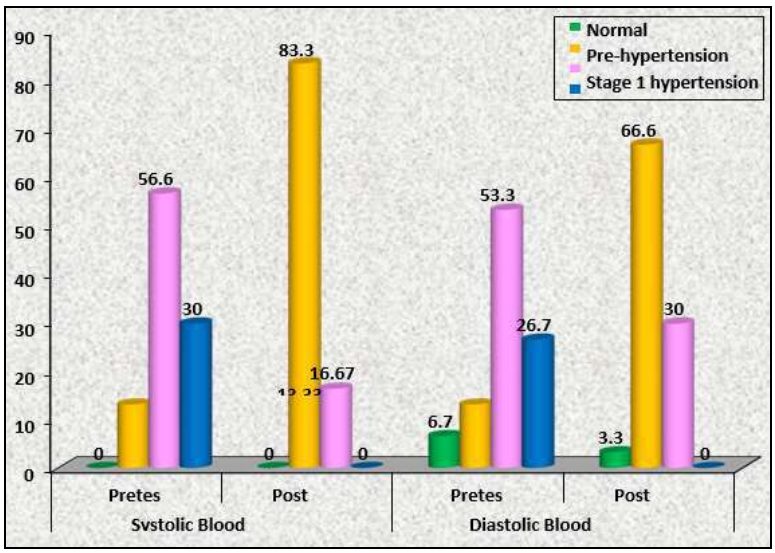

Fig 1: Percentage distribution of level of blood pressure among hypertensive clients in the experimental group

Section-C: To assess the effectiveness of water melon extract on reduction of blood pressure among hypertensive clients.

The findings of the analysis shows that in the experimental group the pretest mean score of systolic BP was 148.0 with standard deviation 10.95 and the post test mean score of systolic BP was 127.33 with standard deviation 7.39. The calculated student paired 't' test value of t = 15.303 was found to be statistically significant at $p<0.001$ level.

The findings of the analysis revealed that in the experimental group the pretest mean score of diastolic BP was 90.0 with standard deviation 8.30 and the post test mean score of diastolic BP was 82.67 with standard deviation 5.21. The calculated student paired 't' test value of t = 5.117 was found to be statistically significant at $p<0.001$ level. (Table 2)

Nayara moreira Lacerd massa *et al*. (2016), Conducted a study on watermelon extract reduce blood pressure but does not change sympathovagal balance in prehypertensive and hypertensive subjects. The result of the study is watermelon extract promoted a significant reduction in systolic (137.8 ± 3.9 to 126.0 ± 4.0 mmHg, p < 0.0001) and diastolic (79.2 ± 2.2 to 72.3 ± 2.0 mmHg, p < 0.001) blood pressure, but showed no differences compared to the placebo group. In conclusion, supplementation with watermelon extract reduces systolic and diastolic blood pressure in prehypertensive and hypertensive individuals, but does not alter the cardiac autonomic modulation of these individuals.

Table 2: Effectiveness of watermelon extract on reduction of blood pressure among hypertensive clients in experimental group, N=60

Blood Pressure	Test	Mean	S.D	Paired 't' test Value
Systolic BP	Pretest	148.0	10.95	**t = 15.303**
	Post Test	127.33	7.39	**p = 0.000**
				S* **
Diastolic BP	Pretest	90.0	8.30	**t = 5.117**
	Post Test	82.67	5.21	**p = 0.000**
				S* **

***$p<0.001$, S – Significant

Table 3: Comparison of post test level of blood pressure among hypertensive clients between the experimental and control group. N = 60(30+30)

Blood Pressure	Test	Mean	S.D	Student Independent 't' test Value
Systolic BP	Experimental	127.33	7.39	t = 11.204
	Control	150.67	8.68	p = 0.0001
				S***
Diastolic BP	Experimental	82.67	5.21	t = 8.098
	Control	93.0	4.66	p = 0.0001
				S***

***$p<0.001$, S – Significant

The findings of the analysis showed in the experimental group the post test mean score of systolic BP was 127.33 with ±7.39 and the post test mean score of systolic BP in the control group was 150.67 with standard deviation 8.38. The calculated student independent 't' test value of t=11.204 was found to be statistically significant at $p<0.001$ level.

The findings of the analysis revealed that in the experimental group the post test mean score of diastolic BP was 82.67 with ±5.21 and the post test mean score of diastolic BP in the control group was 93.0 with ±4.66. The calculated student independent 't' test value of t=8.098 was found to be statistically significant at $p<0.001$ level. (Table 3)

Section-D: To associate between the level of blood pressure among clients with hypertension with their selected demographic variables

Demographic variable dietary pattern had shown statistically significant association with post test level of diastolic BP among hypertensive clients in the experimental group at $p<0.05$ level and other demographic variables had not shown statistically significant association with post test level of diastolic BP among hypertensive clients in the experimental group.

The finding was supported to Revathi. S (October, 2015) had conducted a study to assess the effectiveness of watermelon consumption in control of blood Pressure among hypertensive clients between 40 -70 years in selected villages at Namakkal District. The results of the study is to association between the pre-test blood pressure and demographic variable of hypertensive clients age, sex, education, occupation, type of family, type of occupation, monthly income, marital status, habit sand previous source of information were not significant at 0.05 level. The dietary pattern was found to have significant association at 0.05 level with the pre-test blood pressure level [11].

Conclusion

The results of the present study revealed that there was significant improvement in the post test level of blood pressure in the experimental group which clearly infers that watermelon juice on blood pressure level was found to be effective in reducing the level of blood pressure among clients with hypertensive sample aged above 35 yrs in the experimental group and control group.

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Conflict of interest: Author declare no conflict of interest

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