



Effect of *Moringa oleifera* soup on selected biophysiological parameters among adult with hypercholesterolemia working in selected tertiary care hospital

¹Priya A, ²Sheela J, ³Kalaivani, ⁴Dr. Malarvizhi S, ⁵Dr. Mony K and ⁶Dr. Ravichandran K

¹M.Sc. (N), Department of Medical Surgical Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry, India

²Assistant Professor, Department of Medical Surgical Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry, India

³Assistant Professor, Department of Medical Surgical Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry, India

⁴Professor, H.O.D, Department of Medical Surgical Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry, India

⁵Principal Cum Professor, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry, India

⁶Assistant Professor, Biostatistician, Pondicherry Institute of Medical Sciences, Puducherry, India

Corresponding Author: M.Sc. (N), Department of Medical Surgical Nursing, College of Nursing, Pondicherry Institute of Medical Sciences, Puducherry, India

DOI: <https://doi.org/10.33545/nursing.2023.v6.i2.C.356>

Abstract

Background: “Effect of *Moringa oleifera* soup on selected bio physiological parameters among adult with hypercholesterolemia working in selected tertiary Care Hospital”. Hypercholesterolemia is also called as dyslipidaemia or hyperlipidaemia. In past 20 years it is found that the threat of death related to disorders of abnormal lipid metabolism is increased upto 30%. *Moringa oleifera* is found to be economically and therapeutically effective in reducing the burden of raising health issue.

Methodology: The Quantitative research approach with pre-experimental one group pre-test post- test research design was used. Sample and sampling technique: this study included 40 adults and technique was convenient sampling technique. Setting: The research setting was Pondicherry Institute of Medical Science, Puducherry. Tools: validated self-structured questionnaire. After pre-test assessment of biophysiological parameters participants were given *Moringa oleifera* soup. After 21 days of intervention post-test assessment were done.

Result: The result shows that the effect of intervention on selected biophysiological parameters showed significant difference. Mean pre-test and post-test values of serum total cholesterol were 221.6 ± 23.7 SD, 203.6 ± 24.6 SD respectively with p-value < 0.005 level which is highly statistically significant.

Conclusion: The study findings revealed that there was a significant effect of *moringa oleifera* soup in selected bio physiological parameters weight, BMI, serum total cholesterol.

Keywords: *Moringa oleifera*, biophysiological parameters, hypercholesterolemia

1. Introduction

Hypercholesterolemia is a lipid disorder in which Low Density Lipoprotein (LDL) or Bad cholesterol is too high. Raised serum total cholesterol level is termed as hypercholesterolemia. According to American Heart Association it is stated that hypercholesterolemia is defined as excessively high plasma cholesterol level above 200mg/dl ^[1]. Hypercholesterolemia is so very common. About 1 out of every 20 people has hypercholesterolemia. Hypercholesterolemia can lead to cardiovascular issues such as stroke, coronary artery disease, peripheral vascular disease ^[2].

As the dyslipidemia has been of great concern worldwide due to its potential complication many pharmacological and non-pharmacological agents have been in limelight in the past few decades. Among many non-pharmacological agents *Moringa oleifera* has a remarkable impact. Many bioactive components found in *Moringa oleifera* have influence in lipid homeostasis. *Moringa oleifera* is a good source of polyphenol compounds namely flavonoids and phenolic acids which play a vital role in cholesterol lowering activity. To be specific the phenolic compound such as tannins, saponins found to be effective in lipid regulation. Moreover, it is also a rich source of flavonoids namely quercetin,

myrecytin which are strong antioxidant with hypolipidemic effect [11, 4].

Overall, the Department of food science and technology analysis of the dried powdered *Moringa oleifera* is found to contain 34.51(+/-) 1.57 catechin equivalent of total flavonoid and 78.84 (+/-) 0.3mg/GAE of total phenolic components, and 82.52% of antioxidant is estimated by DHHP assay method. Also, the recommended dose of this dry powdered *Moringa oleifera* is 3-5 grams per day, as overdose and result in gastrointestinal disturbances [4].

1.1 Need for the study

Globally, the prevalence of Hypercholesterolemia is relatively high. The World Health Organization (WHO) reported a global prevalence of 39% in 2008.[1] Recent estimates have shown that around 28.5 million people from the adult population aged 20 years and above have high levels of total serum cholesterol, with the reported prevalence being 11.9% [5].

A cross sectional study on the prevalence of dyslipidaemia in Urban and Rural India shows the regional disparity exists with the higher total cholesterol in Tamil Nadu 18.3%, highest rate of hypertriglyceridemia in Chandigarh 38.6% [6].

A study conducted among Indian population in 2022 states that one in every 6 Indian is found to have increased serum total cholesterol level. Among those age grouped 31 to 41 years has highest prevalence of 69% [6, 10, 8].

2. Methodology

2.1 Research Approach: The Quantitative research approach.

2.2 Research designs: Pre-experimental one group pre-test post-test research design was used.

2.3 Setting of the study: The research setting was Pondicherry Institute of Medical Science, Puducherry

2.4 Population: Adults with hypercholesterolemia

2.4 Sample: Adults with hypercholesterolemia working in PIMS Hospital and who fulfils the inclusion criteria.

2.5 Sample size and Sampling technique: Sample size was calculated with based on the review of literature support. Sample size was calculated from the study of Samuel Adinoyi, Blessing Omoloso, Olutunde Ademola Adegbite with the power 80% and with level of significance 5%. Sample size obtained was 28 [9]. Accounting for 15% attrition sample size increased to 40 finally and the participant was selected by convenient sampling.

2.6 Independent variables: In the present study, it refers to the *Moringa oleifera* soup.

2.7 Dependent variables: In the present study, it refers to the selected bio-physiological parameters such as weight, body mass index, and serum total cholesterol.

2.8 Tool used for data collection: Following tools were used for the data collection.

Tool I: Tool to assess socio demographic variables by using self-structured questionnaire

It consists of 16 demographic variables such as age, gender, religion, educational status, occupation, marital status, type of family, menstrual history, known history of allergy, known family history of HTN, presence of HTN, food habit, type of food taken other than 3 meals, habit of doing exercise, type of exercise practiced among exercisers, time spent in exercise.

Tool II: Observational checklist of bio-physiological parameters.

It consists of 3 bio- physiological parameters such as serum total cholesterol in mg/dl weight in kgs, Body mass Index.

2.9 Reliability of the Tool

In this study the tools used for assessing the bio-physiological parameters are calibrated and checked appropriately.

2.10 Pilot study

Pilot study was conducted in college of nursing, Puducherry institute of medical sciences, Puducherry in the month of June 2023 among 10 Nursing College faculty. During the pilot study the investigator did not face NY problem and found that the study was feasible.

3. Method of data collection

The study was conducted after obtaining permission from the concerned authority. The data was collected during the month of July-August 2023 at Pondicherry Institute of medical Sciences, Pondicherry. PIMS hospital employees were screened and those who fulfilled inclusion and exclusion criteria were selected using convenient sampling technique. The investigator obtained written consent from each sample. The nature and the purpose of the study were explained to them. The data was collected from 40 participants.

On day-0, the participants were gathered in the demonstration room of general medicine out-patient department, pre-intervention assessment of weight, BMI was measured and blood samples for serum total cholesterol were collected by following standard operating protocol, 10-15 minutes were given for the participants to read and fill the questionnaire. Every day from Day 1 -21 the participants were instructed to come to general medicine demonstration room and were given 100ml of *Moringa oleifera* soup between 10am- 11am. Attendance sheet was maintained, and a packet of 3 gm *Moringa oleifera* powder was given in prior to all participants for self-preparation, in case of any absence. All through the study no participants developed any adverse reaction.

Post interventional assessment done after 21st day of intervention. Weight and BMI were measured and calculated using standard procedures, and blood sample for serum total cholesterol was collected following standard operating procedure and processed in biochemistry lab, PIMS.

3.1 Ethical Consideration

The researcher had undertaken formal permission from the concerned authorities. Ethical clearance was obtained from

Institute Ethics Committee (IEC No/RC/2023/55), Pondicherry Institute of Medical Sciences. All participants were explained in the language comprehensible to them, the details of the study and level of risk/ benefit associated with it. Written consent was obtained from the participants. Privacy and confidentiality were strictly maintained.

4. Results

Distribution of adults based on the socio demographic variables: Results shows that nearly half of the participants 19 (47.5%) belongs to the age of less than or equal to 40 years. Majority of the participants 23 (57.5%) are male. Three fourth 31(77.5%) of them belongs to Hindu. Nearly two third of the participants 25(62.5%) were graduate and above. 18(45.0%) belongs to skilled worker category. Majority of them 37(92.5%) were married and 27 (67.5%) belongs to nuclear family. Also out of the 17 female participants 13(76.5%) were menstruating. Majority of participants 36(90.0%) are non-vegetarian. More than half of the participants 22(55.0%) has no family history of hypertension, and majority of the participants 36 (90.0%) has no known history of hypertension. Majority of 14 (35%) has habit of taking fried and baked food items other than 3 meals, similarly 14 (35%) has no habit of taking other than 3 meals. more than one third of participants 17(42.5%) has habit of doing exercise, out of which 12(70.6%) has walking as regular exercise, and majority of participants 12(70.6%) spends 30 minutes per day for exercise. 27 (67.5%) participants were obese.

Distribution of adults based on pre-test and post-test values of serum total cholesterol levels, N=40

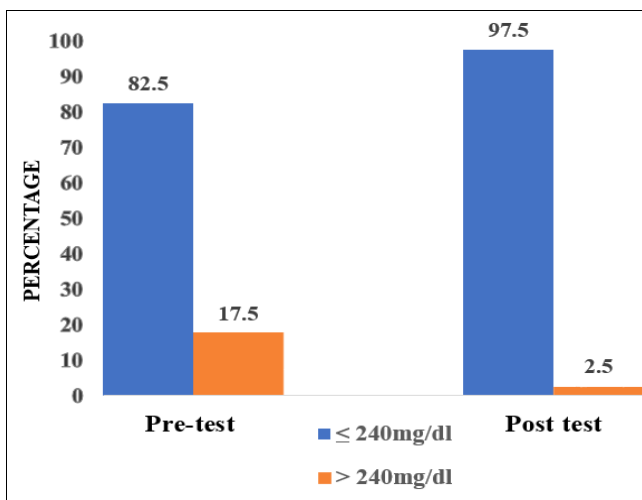


Fig 1: Distribution of adults based on serum total cholesterol pre-test and post-test value

Figure 1 shows 33 (82.5%) has pre-test value of serum total cholesterol less than or equal to 240mg/dl, whereas 39 (97.5%) has post-test value of serum total cholesterol less than or equal to 240mg/dl. Also, the adults those with serum total cholesterol more than 240mg/dl has decreased from 17.5% to 2.5%.

Effect of *Moringa oleifera* soup on selected bio physiological parameters among adults with hypercholesterolemia: The study shows that the

comparison of pre-test mean value of weight was 71.20 with standard deviation 12.86 and post-test mean value of weight was 70.04 with standard deviation 12.79 paired t-test was applied to analyze. The t-value was 12.89 and at p-value was < 0.001 which is statistically significant.

The comparison between the pre-test mean value of BMI was 27.22 with standard deviation 4.29 and post-test mean value of BMI was 26.77 with standard deviation 4.25 paired t test was applied to analyze. The t-value was 12.50 and at p-value was < 0.001 which is statistically significant.

Effect of *Moringa oleifera* soup on serum total cholesterol level among adults with hypercholesterolemia:

The study shows that comparison of pre-test mean value of serum total cholesterol was 221.68 with standard deviation 23.71 and post-test mean value of serum total cholesterol was 203.63 with standard deviation 24.68. Wilcoxon signed ranks test was applied to analyze. The z-value was -5.499 and at p-value was < 0.001 which is statistically significant

Association between pre-test values of serum total cholesterol level among hypercholesterolemia adults with their selected demographic variables:

The study shows that there was no statistically significant association between serum total cholesterol level with selected socio demographic variables such as age, gender, occupation, type of food taken other than 3 meals per day, family history of HTN, known medical illness of HTN, habit of doing exercise. Fisher’s exact test was used to find out the association between the serum total cholesterol with selected demographic variables.

5. Discussion

The study shows difference in the serum total cholesterol level and other selected biophysiological parameters weight, BMI, was highly statistically significant at $p < 0.001$ level. The present study revealed that after the intake of *Moringa oleifera* soup there is statistically significant pre-test and post-test values of serum total cholesterol level with z-score -5.49 and other selected bio physiological parameters weight, BMI among adults with hypercholesterolemia. Hence the research hypothesis H_1 is supported.

In this present study there was no significant association between serum total cholesterol values with their Socio demographic variables like age, gender, education, occupation, type of food taken other than 3 meals, family history of HTN, known medical illness of HTN, habit of doing exercise. Hence the research hypothesis H_2 is not supported.

6. Conclusion

The study showed that *Moringa oleifera* soup has statistically significant difference in the pre-test and post-test values of selected biophysiological parameters weight, BMI, serum total cholesterol. Thus the study has concluded that *Moringa oleifera* soup has been effective on selected biophysiological parameters weight, BMI, serum total cholesterol among adults with hypercholesterolemia.

6. Acknowledgement

I am immensely happy to thank Sr. Dr. Mony. K, Principal

cum professor, Department of child health nursing and Dr. Malarvizhi S, Professor, Head, Department of Medical Surgical Nursing, I owe my heartfelt and deepest gratitude to my guide Sheela J, Assistant professor, Department of Medical Surgical Nursing, I would like to extend my deepest gratitude to Dr. Ravichandran K, Biostatistician, for helping with analysis. I extend my sincere thanks to all the study participants for their cooperation. I am indebted to the members of the institutional scientific committee and institute ethics committee, Pondicherry institute of medical sciences, for their approval and suggestions.

Conflict of Interest

Not available

Financial Support

Not available

7. Reference

1. <https://world-heart-federation.org/news/advocating-for-cholesterol-control-a-world-heart-federation-toolkit>
<https://world-heart-federation.org/cvd-roadmaps/whf-global-roadmaps/cholesterol/dec/14/2023>
2. Non-communicable diseases: Risk factors [Internet]. www.who.int. https://www.who.int/gho/ncd/risk_factors/cholesterol_text/en_Jul_17_2022
3. Sharma M, Sharma SB. Antioxidant evaluation of *Moringa oleifera* leaf extracts. Int. J Biol. Sci. 2020;2(1):22-23. DOI: 10.33545/26649926.2020.v2.i1a.19
4. Vergara-Jimenez M, Almatrafi M, Fernandez M. bioactive components in *Moringa oleifera* leaves protect against chronic disease. Antioxidants. 2017 Nov 16;6(4):91.
5. Benjamin EJ, Virani SS, Callaway CW, Chamberlain AM, Chang AR, Cheng S, et al. Heart disease and stroke statistics-2018 update: A report from the American Heart Association. Circulation. 2018;137:e67-492.
6. Business News Live, Share Market News - Read Latest Finance News, IPO, Mutual Funds News. Business News Live, Share Market News - Read Latest Finance News, IPO, Mutual Funds News [Internet]. The Economic Times. 2019. Available from: <https://economictimes.indiatimes.com>
7. Kaur S. Nutritional value and value-addition in Drumstick-A review. Int. J Agric. Food Sci. 2021;3(2):36-41. DOI: 10.33545/2664844X.2021.v3.i2a.55
8. Expert panel on detection, evaluation, and treatment of high blood cholesterol in adults. Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III). JAMA. 2001 May 16;285(19):2486-97.
9. Effect of *Moringa oleifera* on lipid profile, blood pressure and body mass index in human Seriki SA, Audu AI European journal of pharmaceutical and medical research; c2015.
10. Gupta R, Rao RS, Misra A, Sharma SK. Recent trends

in epidemiology of dyslipidemias in India. Indian Heart Journal. 2017 May;69(3):382-92.

11. Formal meeting of Member States to conclude the work on A/NCD/2 the comprehensive global monitoring framework, including 21 November 2012 indicators, and a set of voluntary global targets for the prevention and control of non-communicable diseases Geneva, [Internet]. https://apps.who.int/gb/NCDs/pdf/A_NCD_2-en.pdf_5-7 November 2012

How to Cite This Article

Priya A, Sheela J, Kalaivani, Malarvizhi S, Mony K, Ravichandran K. Effect of *Moringa oleifera* soup on selected biophysiological parameters among adult with hypercholesterolemia working in selected tertiary care hospital. International Journal of Advance Research in Nursing. 2023;6(2):174-177.

Creative Commons (CC) License

This is an open-access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.