



## A COMPARATIVE STUDY TO ASSESS EFFECT OF FLAX-SEEDS AND MIXTURE OF-HONEY, TULSI, GINGER ON LOWERING CHOLESTEROL-LEVEL AMONG RESIDENTS OF SELECTED VILLAGES OF ANAND DISTRICT.

**Ms. Priyanka Patel**

2ndYear M.Sc.Nursing, Manikaka-Topawala Institute of Nursing– A constituent of Charotar-University of science & Technology, Changa, Taluka: Petlad, District: Anand, Gujarat-388421 India.

**Dr. Anil Sharma\***

Principal & HOD Medical-Surgical Nursing, Manikaka-Topawala Institute of Nursing, College-address: Manikaka-Topawala Institute of Nursing– A constituent of Charotar-University of science & Technology, Changa, Taluka: Petlad, District: Anand, Gujarat-388421 India.\*Corresponding Author

**Mr. Chirag Jain**

Assistant-Professor, Medical-Surgical Nursing, Manikaka-Topawala Institute of Nursing, College-address: Manikaka-Topawala Institute of Nursing– A constituent of Charotar-University of science & Technology, Changa, Taluka: Petlad, District: Anand, Gujarat-388421 India.

### ABSTRACT

The researcher's aim is to compare the effect of mixture of-honey, tulsi, ginger versus flax-seeds on Lowering cholesterol-level in hyperlipidemic-patients. High-cholesterol is risk for heart-disease and responsible for heart-attacks and leading cause for death. Worldwide, one-third of Ischemic-heart-disease is caused due to increase cholesterol-level. Gross, increased cholesterol is approximated to cause 2.6million deaths (4.5%-of total) and 10lakh-DALYS (disability adjusted life years), or 2.0%-of entire DALYS. High-cholesterol is main reason for suffering from many diseases in both developing and developed Countries as causative factor for stroke and heart-disease. Rather than using Modern-medicines, consumption of some of natural herbs which have almost no side-effects are useful in maintaining health. This study is draw to see impact of these herbs-(Honey,Tulsi,Ginger and Flax-seeds) on lowering cholesterol-level.

**KEYWORDS :** tulsi, ginger, flax-seeds, honey, total-cholesterol.

### INTRODUCTION

High-cholesterol is Primary-marker for heart-diseases. Flax-seeds are One of most healthy-diet-to-heart. This amazing small-seeds has played vital role in human-life from last 5000years. Flax-seeds are rich in alpha lenolenic-acid (omega-3-fatty-acid) which is good for heart. 1 American-Heart-Association suggest, consumption of these fibres and omega-3-acids helps boosting-health and helps in reducing risk for cardiovascular-diseases<sup>2</sup>. There are many plants in folklore-practice to treat disease which have auspicious-impact for improving health-conditions. There are almost 80%-of world-population uses home-made natural-remedies as-medicine.

Tulsi is one of herb, use as alternative-medicine in Ayurveda. Tulsi known as-”holey Basil”. It is consider as-Adaptogenic-herb.<sup>3</sup> Some studies have shown tulsi can use for-Diabetes,Reducing-cholesterol,Respiratory-Disorders,Fever,etc. also effective against-Headache,Indigestion,Insomnia and cholera. Tulsi is known as-Queen of Herbs for its eminent-effect-of-Healing properties. Modern-scientific-research proved tulsi is effective in supporting-Heart,Lungs,Blood-vessels,Liver and regulates Blood-circulation.<sup>4</sup>

Honey is one of oldest herbs, produced by-bees from-Nectar. Honey used as Alternative-medicine as Preventive-measures and for-Curing. Honey has many compounds like -Proteins, Vitamins, Carbohydrates, Organic-acids,Anti-oxidants and enzymes. Clinical-trials and laboratory-studies proved honey have broad-spectrum-antimicrobial properties.<sup>5</sup> Modern-medicine, proved honey is beneficial in many disease-condition like-Respiratory, Gastrointestinal-diseases, Skin-diseases like -Psoriasis,Skin-ulcers,Eczema,Wounds and many conditions.<sup>6</sup>

Ginger is one of oldest-Herb, used as Alternative-medicine to cure disease. Ginger have Natural-dietary-components like-Antiplatelet,Anti-Carcinogenic,Antioxidant and Hypolipidemic-properties, which have good impact on Heart, with no side-effects compare to Modern-medicines. Studies proved ginger activates enzymes that surplus use of cholesterol, lowers-cholesterol-level and reduce-body-weight.<sup>7</sup>

### MATERIAL METHOD AND FINDINGS

This study mainly focuses to evaluate effect of mixture of-Honey,Tulsi,Ginger and Flax-seed on lowering cholesterol-level. Researcher found several reviews. Which are collected through various-database include-CINHAL,MEDLINE,Pub-Med,Science-

Direct & Google-scholar. Some significant reviews are as follows:

#### 1.FLAX-SEEDS:

1.Andrea-Edel et.al(2015) conducted Double-blind, FLAX-PAD randomized control-trial in Canada, to check Dietary-Flax-seeds impact on Cholesterol-level in Patient-of-Peripheral artery-disease. They divided in 2Group, Experimental-group-Milled FlaxSeeds-30gm(n=58) and Control-group-Whole-wheat-30gm.(n=52). Result shows, 15%Reduction in LDL(p=0.05) & 11% Reduction in Total-Cholesterol.<sup>8</sup>

2.Yuka-Kawakami et.al(2015) conducted Randomized, Double-Blinded, Cross-over study to evaluate flax-seed-oil effect in reducing-LDL. 15-subjects asked to ingest-10gm flax-seed-oil for-4weeks and 4week-period is washout-period and study switched to-ingestion of corn-oil containing-5.9gmCO and 0.09gm-ALA daily with their regular-diet. Result indicates increased Alpha-Linolenic-Acid(ALA), which shows remarkable decreased cholesterol-level compare to Control-group.<sup>9</sup>

3.Mette-Kristensen et.al(2012) conducted Double-blinded Randomize-Crossover study in-Denmark to see flaxseeds-fiber impact in variant food-metrics on Lipid and elimination of Energy-fat in stool.17subjects-(10women,7men) given-3variant food-items: low-fiber-food-item(placebo-group),Flax-drink-3times/day and flaxseed-bread-3times/day for-8days. Results shows, Flax-drink lowers total-cholesterol-12% and LDL-15%(p<0.01), Flax-fiber-bread reduce7% and 9%(p<0.05). Energy50% and stool-elimination23% raised with using of-flax-drink(p<0.05).<sup>10</sup>

4.Maryam-Torkan et.al(2015), conducted Randomized-controlled-clinical-trial in Iran, to see flax-seeds-effecton lipid-profile. 70-hyperlipidemic-individuals divided in 2-group. Experimental-group given 30gm raw flax-seed-powder for 40days and another is control-group. Results shows Experimental-group reduces Total-cholesterol,Triglycerides,LDL.<sup>11</sup>

5.Sonali-Saxena et.al(2014), conducted-Randomized-clinical-trial in India, to evaluate flaxseed-powder-effect on Cholesterol-level. 50hyperlipidemic-patients divided in-2group. Interventional-group given-30gram-roasted-flaxseeds-powder 1time/day for-30days and another is Control-group. Results shows, flaxseeds consumption improve-blood-pressure and lipid-profile in Interventional-group and

remarkable decrease in-BMI,Blood-pressure,Total-cholesterol,Triglycerides,LDL and increased HDL( $p<0.01$ ).<sup>12</sup>

6.Patade-A. et.al(2008) conducted Randomized-clinical-trial in America, to see flax-seeds impact on cholesterol-level among postmenopausal-women. 55postmenopausal, hyperlipidemic-women divided in 3group: group-A(control-group), group-B(Flaxseed-30gm), and group-C(flaxseeds-oat-bran-fibers) for 3month. Result shows, reduction in LDL-7% and total-cholesterol-10%.<sup>13</sup>

## II.GINGER

1.Shah-Murad et.al(2018) conducted Placebo-controlled study, in Pakistan to see ginger effect on lipid-profile. 60hyperlipidemic-patients divided in 2group. Experiment-group received 5gram-ginger-powder with their normal-diet and placebo-group received-5gram-wheat-powder for-3month. Result shows, reduced LDL-17.41%, total-cholesterol-8.83% and body-weight-2.11%.<sup>07</sup>

2.Reza-Alizadeh-Navaei et.al(2008) conducted Double-blinded-clinical-trial in-Iran, to observe-Ginger-powder impact on lipid-profile. 85cardiac-patientsdivided in 2groups,Experimental-group(n=45) received Ginger-capsule-3gram/day and placebo-group(n=40) received lactose-capsule-3gram in 3divided-dose/day for-45days.Result: Decreased Total-Cholesterol,Triglyceride and LDL( $p<0.05$ ). Mean difference of triglycerides,Total-cholesterol and HDL-increased, and reduced-LDL in experimental-group( $p<0.05$ ).<sup>14</sup>

3.Behrouz-Talaei et.al(2017) conducted, double-blinded-placebo-control-study in-Iran, to see Ginger-impact on lipid-level. 88type-II-Diabetic-patients divided in 2groups. Experimental-group received 3gram-Ginger-powder-capsule and placebo-group received cellulose-microcrystalline-3grams after their meal for 8weeks. Result shows, reduced-LDL and total-cholesterol in experimental-group( $p=0.023$ ).<sup>15</sup>

4.Tahereh-Arablou et.al(2014) conducted Double-blinded-placebo-control-Clinical-trial to see Ginger-impact on lipid,Sugar-levels. 70-type-II-Diabetic-patients divided in 2groups. Treatment-group received-1600mg-Ginger-powder and Placebo-group received-1600mg-wheat-flour for-12weeks. Result shows reduction in plasma-glucose and total-cholesterol( $p<0.05$ ).<sup>16</sup>

5.Karimi N. et.al(2015) conducted Pre-test-Post-test Randomized-clinical-trial in-Iran, to compare effect of water-based-exercise and ginger-supplement on bio-parameters of obese-woman with breast-neoplasm. 40women divided in 4groups: Group1-Placebo-group, Group2-Exercise-training, Group3-Ginger-supplement and Group4 received both Exercise-training + Ginger-supplement. Participants in Group3-4, received 4capsules/day for-6weeks. Water-based-Exercise Scheduled in pool 4times/week, continued till 6week. Result shows Ginger-supplementation reduces serum-CRP, Lipid-profile and Glycemic-index.<sup>17</sup>

## III.HONEY

1.Mohd-Rashid-Radzniwan et.al(2019) conducted Quasi-experimental-Interventional-study in Malaysia, to see Honey-impact on Lipid,Glucose-level. 60diabetic-patients divided in 2groups. Experimental-group received 30gram-honey/day for-30days and another is Control-group. Result shows, honey is beneficial for Glucose,Lipid-profile and other Metabolic-parameters.<sup>6</sup>

2.Rehana-Mushtaq et.al(2010) conducted Intervention-control-clinical-trial in Pakistan to see Honey-impact on lipid-profile. Study done in 4-parallel Ethnic-groups [Pathani,Baloch,Hazara and Punjabi]. 80Patients divided in 2groups. 40-Experimental-participants received 40gram-honey dissolved in water with normal-diet for-4weeks. and another-40 are Control-group. Results shows,reduction in Total-cholesterol in experimental-group.<sup>15</sup>

3.Yaghoobi N. et.al(2008) conducted Randomized-clinical-trial, to see Honey effect on lipid-profile,CRP and blood-glucose. 55Patients divided in 2groups: Control-group(n=17) received 70gram-sucrose and Interventional-group(n=38), received 70gram-natural-honey/day for-30days. Result shows honey consumption reduces body-weight-1.3%, fat-1.1%, Total-cholesterol-3%, LDL-5.8%, triglycerides-11%, blood-glucose-4.2% and CRP-3.2% and increased HDL-3.3%.<sup>18</sup>

4.Karsten-Munstedt et.al(2009) conducted Randomized-clinical-trial to observe honey-effect on cholesterol-level. 60hyperlipidemic-individuals divided in 2groups. Experimental-group received 75gram-

honey-solution and Control-group received-Sugar-solution/day for-14days. Result shows honey consumption lowers cholesterol-level( $p<0.001$ ).<sup>19</sup>

5.Bahrami-M. et.al(2009) conducted Randomized-clinical-trial to see Honey-effect on body-weight and lipid-profile. 48-Diabetic-patients divided in 2groups. Treatment-group received-honey for 8weeks and Placebo-group received no-any-intervention. Result shows no difference in blood-sugar-value, But reduction in body-weight,Total-cholesterol,Triglyceride,LDL and increased HDL( $p<0.01$ ) in treatment-group.<sup>20</sup>

## IV.TULSI

1.Satpathy-S.,et.al(2016) conducted Randomized-Clinical-Trial, to see Tulsi-effect on metabolic and biochemical-parameters. 30obese-individuals allocated in 2groups: Experiment-group(n=16) received 1capsule-Tulsi-250mg-2times/day empty-stomach up-to 8weeks and Placebo-group(n=14) received no intervention. Results shows reduction in triglycerides,LDL,VLDL,BMI,Insulin and increased HDL in Interventional-group.<sup>21</sup>

2.Hayley-L.,et.al(2015) conducted Randomized-double-blind-Control-clinical-trial in-Australia, to see Tulsi-effect on bio-parameters and lipid-profile. 30-obese-Overweight-patients divided in 2groups: Interventional-group received 250mg-tulsi-2times/day for-12weeks and Placebo-group received no treatment. Result shows, reduction in Hip,Waist-circumference,Total-cholesterol and insulin-level( $p=0.02$ ) in Interventional-group.<sup>22</sup>

3.R.P.Agarwal et.al(2012) conducted Randomized-clinical-trial in-Bikaner, to evaluate Tulsi-effect on biochemical-parameters.100-Diabetic-patients divided in 2groups: Experimental-group received 5ml-Tulsi-extracts-2times/day for-3months and another is Control-group. Result shows, improvement in-BMI,Blood-Pressure,Blood-Sugar,HbA1c also decreased Total -cholesterol, Triglycerides, LDL, VLDL and increased-HDL in Experimental-group.<sup>23</sup>

4.Dr.Bhavana-Chauhan et.al(2010) conducted Randomized-control-trail in-Gujarat, to see dried-Tulsi-leaves-powder impact on hyperlipidemic(n=20) and hyperglycemic(n=20) patients, received 1capsule(3gram-tulsi-powder) daily on empty stomach for-45days. Result shows, decreased Total-cholesterol,LDL,Triglyceride and improvement in-HDL and reduction in glucose-level.<sup>24</sup>

5.Shankar-Mondal et.al(2012) conducted Double-blinded-Randomized-Controlled-trial in Crossover-format, in-India to see impact of Tulsi-leaves in biochemical-levels among 24subjects received 300mg-Tulsi-capsules on empty stomach for 4weeks thereafter 3weeks washout-period and they administered-sucrose for 4weeks. Results show Tulsi suppress lipid-profile and hepatic-lipid.<sup>25</sup>

6.Dinesh-Kumar-Balasubramaniam et.al(2010) conducted Randomized-clinical-trial in West-Bengal, to evaluate effect of liquid form of different Herb-plants-extracts on lipid-profile and glucose-level. 400type-II-Diabetic-patient experimented with different Herbs include- Copper-leaf,Garlic,Onion,Neem,Banana,Mango,Curry-leaves,Tulsi,Leaf-flower and Gaduchi. 10control and 10experimental-groups were formed for each comparison. Liquid-extract of particular herb received by experimental-group for-2months. Results show decreased blood-glucose by Mango-leaves,Curry-leaves and Neem-leaves. Tulsi lowers Total-cholesterol and increase level of-HDL. Onion,Mango,Curry and Leaf-flower shows decrease in-Triglycerides and LDL.<sup>26</sup>

## DISCUSSION

After reviewing literatures, it is seen that use of these ingredients, is useful to maintain health and good for lipid-profile. It lowers low-density lipoprotein, and increase level of high-density lipoprotein and it helps in lowering-cholesterol. Many studies have proven that uses of these ingredients on daily basis, helpful for improving general health.

## CONCLUSION

It was concluded that use of these herbs (honey, tulsi, ginger, flax-seeds) are useful in reducing total-cholesterol-level and are beneficial to treat many conditions.

**CONFLICT OF INTEREST:** None

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