Impact of Dietary Habits on Lipid Profile in Old Age Persons: Survey Study Conducted at OPD of Punjab Institute of Cardiology, Lahore, Pakistan

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ABSTRACT

Introduction: Dyslipidaemia is common health issue in emerging nations and its incidence is increasing constantly. The deleterious effects of this disorder are very high in terms of mortality, morbidity and clinical expenses. The risk of coronary heart disease is considerably enhanced due to high LDL-C when linked with hyper triglyceride. **Methods:** A cross sectional study was conducted at the OPD of Punjab Institute of Cardiology to assess lipid profile of older adults associated with dietary habits. **Results:** The results showed a positive correlation between a higher daily eating frequency and lower levels of T-C and LDL-C. Impact of more frequent consumption of red meat on higher T-C and LDL-C levels was not confirmed. It was recorded that a huge distinction between the impact of low-fat and entire fat milk utilization on the T-C and LDL-C levels. It was also noted that everyday utilization of vegetables on LDL-C gave beneficial effects as compared to its utilization 1-2 times/week. **Conclusion:** Study results supported the hypothesis

that diet is one of the most important determinants in CVD and its associated risk factors. The collected data concluded that mostly older peoples had high level of cholesterol and LDL and low level of HDL because of excessive consumption of milk meat and fatty food.

Keywords: Cardiovascular disease, Cholesterol level, Dietary factors, Dyslipidaemia

1. INTRODUCTION

An irregularity in lipid plasma levels leads to a condition known as Dyslipidaemia. These irregularities might be quantitative, subjective or both. Because of high low-thickness lipoprotein cholesterol, high plasma total cholesterol, high fatty substances and lower high-thickness lipoprotein cholesterol levels, happening separately or in mixture leads to qualitative dyslipidaemia. Qualitatively, dyslipidaemia suggests alterations in construction of LDL-C which incorporates little heavy LDL-C and prolonged TG content [1]. Most likely there exists a direct relationship between cardiovascular risk factor and lipid levels [2]. Dyslipidaemia adds in the progression of atherosclerosis [3]. The atherogenic dyslipidaemia profile is illustrated by raised TG, elevated HDL-C and a majority of profuse, insignificant LDL-C particles [4].

Dyslipidaemia is the second most prevalent cardiovascular risk factor [5]. When related with high LDL-C, hypertriglyceride primarily expands the risk of coronary illness [6]. According to WHO measure in 2002, presented that dyslipidaemia signified for 56% of stroke, 18% of ischemic coronary and multiple million passing's each year worldwide. It is an ill health condition in emerging nations and its incidence is increasing consistently. This reality is disturbing in the connection among dyslipidaemia and atherosclerosis illnesses [7]. Level of dyslipidaemia were decide in grown-ups and factors related with dyslipidaemia (gender, physical exercise levels, educational level, so forth) was examined [8]. Females had blood lipid boundaries in the typical ranges more frequently than did male for a long time somewhere in the range of 18 and 55 [9]. However, female more than 55 had less ideal blood lipid limits than men. For age 18 _ 60 years female had a better dispersion of cholesterol sub - divisions as shown by lower TC/HDL-C than male [10]. Dyslipidaemia is a modifiable risk factor for cardiovascular illness.

Cholesterol is an indispensable part of eukaryotic cell layers since it balances out them and regulates lipid and protein movement across the film [11]. Explicitly connected with the cochlea,

the lipid preparation, smoothness, and firmness of the external hair cell sidelong divider layer have been demonstrated to be critical to its electromotile work and the cochlear enhancer. The external hair cell's, lateral plasma layer also appears to have low cholesterol than new cells [12]. By considering the effects of saturated (palm olein) and polyunsaturated (soybean oil) cooking oils on the lipid prohies of Malaysian male adolescents eating normal Malaysian diets for 5 wk. The diet cooked with palm olein significantly increased apolipoprotein A-I (11%) and apolipoprotein B (9%) concentrations [13]. Unexpectedly, soybean-oil-cooked diets caused a significant increase (47%) in plasma triglycerides compared with palm-olein-cooked diets. We conclude that palm olein, when used as cooking oil, has no detrimental effects on plasma lipid profiles in Malaysian adolescents [14].

To measure diverse type of food consumption manners like the kind of dinners, fast food, and beverages are taken with a meal. Our overview uncovered that nibbling that is insistently connected with the daily utilization of fatty and salty food also having sweet beverages with dinners was decidedly connected with the normal intake of already prepared food. Having a forenoon dinner is decidedly connected with the utilization of at least two parts of milk and dairy items and vegetables. In noontime meal there is also recommendation of taking milk and dairy items and organic products. To upgrade the knowledge of the assurance that consumption of food makes to a sound eating regimen in view of food utilization tendency [15]. This effort gives an understanding into eating manner and would make a valued obligation to mediate pointed and advancing better dietary patterns.

2. MATERIALS AND METHODS

It was a cross-sectional study. Data was collected to assess lipid profile of older adults and effect of dietary habits on lipid profile of older adults at OPD of Punjab institute of cardiology. This study involved about randomly selected 70 persons from different area. Permission from the respective institution was taken. The data was kept confidential and was used only for survey work. Consent was also taken from the study participants, those willing to participate in the study were included. Those who have having any reservations were excluded from the study. The data was collected by self-designed questionnaire. The data included biochemical test and food frequency. Dietary

assessment was done by food frequency questionnaire. Data was analysed through SPSS version 21. The data was analysed by using frequency standard deviation mean and tables.

3. RESULTS

Table 3.1: Frequency distribution according to Gender

Gender	Frequency	Percent
Male	37	52.9 %
Female	33	47.1 %
Total	70	100.0 %

Table 3.1 shows that 52.9 % male and 47.1% female participated in the survey.

Table 3.2: Frequency distribution according to Total cholesterol

Total cholesterol	Frequency	Percent
Optimal	32	45.7 %
Moderate	21	30.0 %
High	17	24.3 %
Total	70	100.0 %

Table 3.2 shows that among 70 people, 32 had optimal level of cholesterol and 21 people had moderate level of cholesterol and 17 people had high level of cholesterol.

Table 3.3: Frequency distribution according to Total cholesterol and Gender

Gender	Optimal		Moderate		High		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Male	16	50%	13	61.9%	8	47.1%	37	52.9%

Female	16	50%	8	38.1%	9	52.9%	33	47.1%

Table 3.3 shows that 50% of male and 50% of female had optimal whereas 61.9% of male and 38.1% of female had moderate levels of cholesterol. 47.1% male and 52.9% female had high level of cholesterol. There was no association between total cholesterol and gender (p-value .599)

Table 3.4: Frequency distribution and their levels according to total cholesterol and other types of lipids

Types of Lipids	Optimal cholesterol	Moderate cholesterol	High cholesterol	Total
LDL	68.8%	23.8%	5.9%	40.0%
	31.3%	57.1%	41.2%	41.4%
	0.0%	19.0%	52.9%	18.6%
HDL	100%	66.7%	76.5%	84.3%
	0%	33.3%	17.6%	14.3%
	0.0%	0.0%	5.9%	1.4%
Triglyceride	78.1%	28.6%	5.9%	45.7%
	15.6%	42.9%	58.8%	34.3%
	6.3%	28.6%	35.3%	20.0%

Figure 3.4 show that 5.9 % people had optimal level of LDL and 41.2 % peoples had moderate level of LDL and 52.9 % people had high level of LDL. Among total 76.5% people had optimal 17.6% people had moderate level of HDL and 5.9% people had high level of HDL. Table 3.4 shows 6.3% people had high triglycerides 35.3% people had high levels of cholesterol.

Table 3.5: Relationship of diverse type of diet consumption on cholesterol level

Table 3.5.1: Frequency distribution according to total cholesterol and Milk

Milk	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	19	59.4%	12	57.1%	6	35.3%	37	52.9%
4-6 days	3	9.4%	1	4.8%	5	29.4%	9	12.9%
2-4 days	4	12.5%	3	14.3%	1	5.9%	8	11.4%
2-1 days	3	9.4%	1	4.8%	0	0.0%	4	5.7%
Occasionally	2	6.3%	4	19.0%	3	17.6%	9	12.9%
Never	1	3.1%	0	0.0%	2	11.8%	3	4.3%

Table 3.5.1 represents 59.4 % people consumed optimal cholesterol 57.1% people consumed moderate cholesterol and 35.3% people consumed high cholesterol on daily basis. On the other hand people who consumed milk occasionally had 6.3% optimal cholesterol, 19.0% people had moderate cholesterol and 17.6% people had high cholesterol. There is no association between total cholesterol and milk (p-value <0.175)

Table 3.5.2: Frequency distribution according to total cholesterol and Egg

EGG	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	12	37.5%	8	38.1%	10	58.8%	30	42.9%
4-6 days	4	12.5%	2	9.0%	2	11.8%	8	11.4%
2-4 days	8	25%	3	14.3%	2	11.8%	13	18.6%
2-1 days	3	9.4%	4	19.0%	1	5.9%	8	11.4%
Occasionally	5	15.6%	4	19.0%	2	11.8%	11	15.7%

Figure 3.5.2 showed that 37.5% people had optimal cholesterol level who were consuming eggs on daily basis. 38.1% people had moderate cholesterol level and 58.8% people had high cholesterol level with the consumption of eggs on daily basis. There is no association between total cholesterol and egg (p-value <0.785).

Table 3.5.3: Frequency distribution according to total cholesterol and Yogurt

Yogurt	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	5	15.6%	8	38.1%	6	35.3%	19	27.1%
4-6 days	3	9.4%	1	4.8%	1	5.9%	5	7.1%
2-4 days	5	15.6%	3	14.3%	1	5.9%	9	12.9%
2-1 days	4	12.5%	2	9.5%	0	0.0%	6	8.6%
Occasionally	13	40.6%	7	33.3%	7	41.2%	27	38.6%
Never	2	6.3%	0	0.0%	2	11.8%	4	5.9%

Table 3.5.3 show that 40.6% people with optimal cholesterol level consumed yogurt occasionally and 33.3% people with moderate cholesterol and 41.2% people with high cholesterol. There was no association between total cholesterol and yogurt (p-value <0.553)

Table 3.5.4: Frequency distribution according to total cholesterol and Cheese

Cheese	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
4-6 days	3	9.4%	1	4.8%	0	0%	4	5.7%
2-4 days	0	0.0%	2	9.5%	0	0%	2	2.9%

2-1 days	4	12.5%	1	4.8%	0	0.0%	5	7.1%
Occasionally	15	46.9%	9	42.9%	5	29.4%	29	41.4%
Never	10	31.3%	8	38.1%	12	70.6%	30	42.9%

Table 3.5.4 show that 46% people with optimal cholesterol level consumed cheese occasionally and 42.9 % people with moderate and 29.4% people with high cholesterol level consumed cheese occasionally. There was no association between total cholesterol and cheese (p-value <0.079)

Table 3.5.5: Frequency distribution according to total cholesterol and Legumes

Legumes	**Optimal cholesterol**		**Moderate cholesterol**		**High cholesterol**		**Total**	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
4-6 days	2	6.3%	6	28.6%	9	52.9%	17	24.3%
2-4 days	10	31.3%	9	42.9%	2	11.8%	21	30.0%
2-1 days	8	25.0%	0	0%	0	0.0%	8	11.4%
Occasionally	8	25.0%	2	9.5%	3	17.6%	13	18.6%
Never	4	12.5%	4	19.0%	3	17.6%	11	15.7%

Table 3.5.5 showed that 25.0% people with optimal cholesterol level consume legume occasionally 9.5% people with moderate and 17.6% people with high cholesterol level consume legume occasionally. There was association between total cholesterol and legumes (p-value <0.002)

Table 3.5.6: Frequency distribution according to total cholesterol and Chicken

chicken	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	5	15.6%	2	9.5%	1	5.9%	8	11.4%
4-6 days	2	6.3%	6	28.6%	1	5.9%	9	12.9%
2-4 days	9	28.1%	11	52.4%	6	35.3%	26	37.1%
2-1 days	9	28.1%	2	9.5%	1	5.9%	12	17.1%
Occasionally	5	15.6%	0	0%	4	23.5%	9	12.9%
Never	2	6.3%	0	0.0%	4	23.5%	6	8.6%

Table 3.5.6 show that 28% people with optimal cholesterol level consumed chicken 2-4days/week and 52% people with moderate and 35% people with high cholesterol level consumed chicken 2-4days per week. (p-value <0.034)

Table 3.5.7: Frequency distribution according to total cholesterol and Fish

Fish	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	2	6.3%	0	0%	1	5.9%	3	4.3%
4-6 days	2	6.3%	0	0%	1	5.9%	3	4.3%
2-4 days	1	3.1%	3	14.3%	1	5.9%	5	7.1%
2-1 days	9	28.1%	2	9.5%	1	5.9%	12	17.1%
Occasionally	13	40.6%	11	52.4%	7	41.2%	31	44.3%
Never	5	15.6%	5	23.8%	6	35.3%	16	22.9%

Table 3.5.7 show that 40% people with optimal cholesterol consumed fish occasionally and 52% people with moderate and 35% people with high cholesterol consumed fish never. There was association between total cholesterol and fish (p-value <00.003).

Table 3.5.8: Frequency distribution according to total cholesterol and Fruits

Fruits	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	13	40.6%	13	61.9%	6	35.3%	32	45.7%
4-6 days	9	28.1%	5	23.8%	8	47.1%	22	31.4%
2-4 days	3	9.4%	2	9.5%	3	17.6%	8	11.4%
2-1 days	4	12.5%	0	0.0%	0	0.0%	4	5.7%
Occasionally	3	9.4%	1	4.8%	0	0.0%	4	5.7%

Table 3.5.8 show that 40% people with optimal cholesterol level consumed fruit daily and 61% people with moderate and 35.3% people with high cholesterol level consumed fruit on daily basis. There was no association between total cholesterol and fruit (p-value <0.0.020)

Table 3.5.9: Frequency distribution according to total cholesterol and Green vegetables

Green veg	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	4	12.5%	9	42.9%	6	35.3%	19	27.1%
4-6 days	11	34.4%	10	47.6%	7	41.2%	28	40.0%
2-4 days	14	43.8%	2	9.5%	2	11.8%	18	25.7%
2-1 days	1	31.1%	0	0.0%	0	0.0%	1	1.4%

Occasionally	2	6.3%	0	0.0%	2	11.8%	4	5.7%

Table 3.5.9 show that 43.8% people with optimal cholesterol level consumed green vegetables 2-4 days per week 9.5% people with moderate and 11.8% people with high cholesterol level consumed green vegetables 2 -4 days per week. (p-value <0.005)

Table 3.5.10: Frequency distribution according to total cholesterol and other vegetables

Other veg	**Optimal cholesterol**		**Moderate cholesterol**		**High cholesterol**		**Total**	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	10	31.3%	11	52.4%	9	52.9%	30	42.9%
4-6 days	7	21.9%	6	28.6%	5	29.4%	18	25.7%
2-4 days	6	18.8%	1	4.8%	0	0.0%	7	10.0%
2-1 days	4	12.5%	3	14.3%	1	5.9%	8	11.4%
Occasionally	5	15.6%	0	0.0%	2	11.8%	7	10.0%

Table 3.5.10 show that 32% people with optimal cholesterol level consumed other vegetables daily and 52% people with moderate and 52% people with high cholesterol level consumed other vegetables daily. There was no association between total cholesterol and other vegetables (p0.218).

Table 3.5.11: Frequency distribution according to total cholesterol and Fresh fruit juices

Fruit juice	**Optimal cholesterol**		**Moderate cholesterol**		**High cholesterol**		**Total**	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage

Daily	4	12.5%	6	28.6%	2	11.8%	12	17.1%
4-6 days	5	15.6%	1	4.8%	1	5.9%	7	10.0%
2-4 days	9	28.1%	5	23.8%	6	35.3%	20	28.6%
2-1 days	4	12.5%	6	28.6%	0	0.0%	10	14.3%
Occasionally	9	28.1%	3	14.3%	6	35.3%	18	25.7%
Never	1	3.1%	0	0.0%	2	11.8%	3	4.3%

Table 3.5.11 show that 28% people with optimal cholesterol level consumed fruit juice 2-4 days per week and 23% percent with moderate and 35% people with high cholesterol level consumed fruit juice 2-4 days per week. There was association between total cholesterol and fruit juice (p-value 0.005).

Table 3.5.12: Frequency distribution according to total cholesterol and Roti

Roti	**Optimal cholesterol**		**Moderate cholesterol**		**High cholesterol**		**Total**	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	19	59.4%	20	95.2%	14	82.4%	53	75.7%
4-6 days	7	21.9%	1	4.8%	1	5.9%	9	12.9%
2-4 days	2	6.3%	0	0.0%	0	0.0%	2	2.9%
2-1 days	3	9.4%	0	0.0%	0	0.0%	3	4.3%
Occasionally	1	3.1%	0	0.0%	0	0.0%	1	1.4%
Never	0	0.0%	0	0.0%	2	11.8%	2	2.9%

Table 3.5.12 show that 59% people with optimal cholesterol level consumed roti daily and 95% people with moderate and 83% people with high cholesterol level consumed roti daily. There was no association between total cholesterol and roti (p-value <0.036).

Table 3.5.13: Frequency distribution according to total cholesterol and Rice

Rice	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	13	40.6%	7	33.3%	3	17.6%	23	32.9%
4-6 days	4	12.5%	3	14.3%	0	0.0%	7	10.0%
2-4 days	13	40.6%	5	23.8%	5	29.4%	23	32.9%
2-1 days	1	3.1%	4	19.0%	7	41.2%	12	17.1%
Occasionally	1	3.1%	2	9.5%	2	11.8%	5	7.1%

Table 3.5.13 show that 40% people with optimal cholesterol level consumed rice daily and 33% people with moderate and 17.6% people with high cholesterol level consumed rice 2-1 days per week. There was association between total cholesterol and rice (p-value <0.004).

Table 3.5.14: Frequency distribution according to total cholesterol and Bread

Bread	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	5	15.6%	4	19.0%	4	23.5%	13	18.6%
4-6 days	0	0.0%	0	0.0%	1	5.9%	1	1.4%
2-4 days	4	12.5%	2	9.5%	1	5.9%	7	10.0%
2-1 days	9	28.1%	6	28.6%	1	5.9%	16	22.9%
Occasionally	14	43.8%	5	23.8%	7	41.2%	26	37.1%
Never	0	0.0%	4	19.0%	3	17.6%	7	10.0%

Table 3.5.14 show that 43.8% people with optimal cholesterol level consumed bread occasionally and 23.8% people with moderate and 41.2 % people with high cholesterol level consumed bread occasionally. There was no association between total cholesterol and bread (p-value <0.165)

Table 3.5.15: Frequency distribution according to total cholesterol and Burgers/pizzas

Burger	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	5	15.6%	2	9.5%	1	5.9%	8	14.4%
4-6 days	0	0.0%	1	4.8%	2	11.8%	3	4.3%
2-4 days	3	9.4%	3	14.3%	0	0.0%	6	8.6%
2-1 days	8	25.0%	4	19.0%	0	0.0%	12	17.1%
Occasionally	11	34.4%	3	14.3%	8	47.1%	22	31.4%
Never	5	15.6%	8	38.1%	6	35.3%	19	27.1%

Table 3.5.15 show that 15.6% people with optimal cholesterol level consumed burger daily and 9.5% people with moderate and 5.9% people with high cholesterol level consume bread occasionally. (p-value <0.005)

Table 3.5.16: Frequency distribution according to total cholesterol and Tea

Tea	Optimal cholesterol		Moderate cholesterol		High cholesterol		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	11	34.4%	14	66.7%	5	29.4%	30	42.9%
4-6 days	1	31.1%	0	0.0%	0	0.0%	1	1.4%
2-4 days	2	6.3%	3	14.3%	1	5.9%	6	8.6%
2-1 days	2	6.3%	0	0.0%	3	17.6%	5	7.1%

Occasionally	7	21.9%	3	14.3%	7	41.2%	17	24.3%
Never	9	28.1%	1	4.8%	1	5.9%	11	15.7%

Table 3.5.16 show that 34% people with optimal cholesterol level consumed tea daily and 66% people with moderate and 29.4% people with high cholesterol level consumed tea occasionally. There was association between total cholesterol and tea (p-value <0.005).

Table 3.5.17: Frequency distribution according to total cholesterol and Milkshake

Milk shake	**Optimal cholesterol**		**Moderate cholesterol**		**High cholesterol**		**Total**	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage
Daily	8	25.0%	4	19.0%	5	29.4%	17	24.3%
4-6 days	0	0.0%	2	9.5%	1	5.9%	3	4.3%
2-4 days	11	34.4%	0	0.0%	6	35.3%	17	24.3%
2-1 days	2	6.3%	8	38.1%	1	5.9%	11	15.9%
Occasionally	9	28.1%	4	19.0%	4	23.5%	17	24.3%
Never	2	6.3%	3	14.3%	0	0.0%	5	7.1%

Table 3.5.17 show that 34% people with optimal cholesterol level consumed milk shake 2-4 days and 35% people with high cholesterol level consumed milk on 2-4 days interval. There was no association between total cholesterol and milkshakes (p-value <0.010)

Table 3.5.18: Frequency distribution according to total cholesterol and Juice pack

Juice pack	**Optimal cholesterol**		**Moderate cholesterol**		**High cholesterol**		**Total**	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	percentage

Daily	3	9.4%	2	9.5%	3	17.6%	8	11.4%
4-6 days	4	12.5%	5	23.8%	0	0.0%	9	12.9%
2-4 days	0	0.0%	1	4.8%	0	0.0%	1	1.4%
2-1 days	9	28.1%	3	14.3%	7	41.2%	19	27.1%
Occasionally	11	34.4%	6	28.6%	4	23.5%	21	30.0%
Never	5	15.6%	4	19.0%	3	17.6%	12	17.1%

Table 3.5.18 show that 34% people with optimal cholesterol level consumed juice pack occasionally and 28% people with moderate and 23.5% people with high cholesterol level consumed juice pack. There was association between total cholesterol and juice pack (p-value <0.002)

4. DISCUSSION

The high-fat utilisation is normally included with the dietary propensities [16]. Because of westernisation throughout recent years, the common eating regimen currently additionally contains high fat [17] . The repeated intake of food displayed that eating vegetables, fruits and cooking them with monounsaturated fat for one year gave elevated outcomes in the trial group in comparison to the control group [18]. The complete costs reduced for the two groups which is 10 percent for control group and 38 percent for the experimental group, though the expense distinction was measurably non-significant [19]. The two groups have prominent low-thickness lipoprotein decreases, importantly in the investigative groups.

The finding proposes that for patients with Coronary artery disease the utilisation of team office visits proved be helpful in improving their diet and for further developing lipid levels. Patients with known Coronary course sickness and raised lipid levels were ready to make huge way of life changes when offered a program that underscores quality food sources in a gathering visit format [20]. The observational review, no matter what the degree of milk fat, have not tracked down a

connection between milk item consumption and expanded hazard of coronary illness, stroke, or other heart and vessel sicknesses. Temporary mediation studies described that entire milk and margarine raise LDL-C, yet in addition HDL-C, and, subsequently, may not influence plasma levels [21]. Concerning cardiovascular safety, nonetheless, the fats containing items significant [22]. Naturally grown vegetables and fruits are enriched in nutrition, having a lot of vitamins, minerals, dietary fibre and nutrients along with antioxidant property [23] . It is accepted that advanced utilization of these item diminishes the risk of creating ongoing illnesses, including infections of the cardiovascular framework [24]. In this manner, it is prescribed to remember five percent of vegetables and fruits in everyday food proportions.

The data necessary for the detection of dietary habits were obtained by a questionnaire method in closed-ended format. Data collection was carried out simultaneously with the somatometric and biochemical examinations of the respondents ensured by the Nitra Cardio Centre. The following parameters were evaluated: total cholesterol (T-C), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), triglycerides, and blood glucose. According to present study older adults consume more saturated fat. Dyslipidaemia is associate with high intake of bread, meat, and processed food. Male have high triglycerides, total cholesterol and LDL level than female. Mostly dyslipidaemic older adults are diabetic and obese also. Dyslipidaemia is more common in females in the binary areas of home. The outcomes shows that observing the lipid profile is a significant cause for the management and counteraction of cardiovascular disease. This study correlate with present study mostly older adults have high level of LDL level and total cholesterol and low level of HDL because of high intake of fat containing milk and milk products. But egg and fish, there is no significant effect on blood lipid profile.

5. CONCLUSION

The study concluded that total cholesterol and triglycerides level in older adults were high. Results showed that 30% people were at risk and 24.3 % had high level of cholesterol. LDL level also increased and 32 % older adults have normal level of HDL and 17 % older adults at risk of HDL and 17 % have low level of HDL . Causing dyslipidemia is reason of high intake of fat containing milk and high consumption of meat and processed food. The low consumption of fruits and organic food can raise the level of cholesterol.

STUDY LIMITATIONS

As data was collected from just one hospital so the results cannot be generalized to whole nation.

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CONFLICT OF INTEREST

Authors have declared that there is no conflict of interest.

REFERENCES

1. O'Brien, S.T., O.M. Neylon, and T. O'Brien, *Dyslipidaemia in type 1 diabetes: Molecular mechanisms and therapeutic opportunities.* Biomedicines, 2021. **9**(7): p. 826.

2. Decandia, F., *Risk factors for cardiovascular disease in subclinical hypothyroidism.* Irish Journal of Medical Science (1971-), 2018. **187**(1): p. 39-43.

3. Kurdi, A., W. Martinet, and G.R. De Meyer, *mTOR inhibition and cardiovascular diseases: dyslipidemia and atherosclerosis.* Transplantation, 2018. **102**(2S): p. S44-S46.

4. Okopień, B., L. Buldak, and A. Bołdys, *Fibrates in the management of atherogenic dyslipidemia.* Expert review of cardiovascular therapy, 2017. **15**(12): p. 913-921.

5. Daya, R., Z. Bayat, and F. Raal, *Prevalence and pattern of dyslipidaemia in type 2 diabetes mellitus patients at a tertiary care hospital.* Journal of Endocrinology, Metabolism and Diabetes of South Africa, 2017. **22**(3): p. 31–35-31–35.

6. Jellinger, P.S., et al., *American Association of Clinical Endocrinologists and American College of Endocrinology guidelines for management of dyslipidemia and prevention of cardiovascular disease.* Endocrine Practice, 2017. **23**: p. 1-87.

7. Gutiérrez-Cuevas, J., A. Santos, and J. Armendariz-Borunda, *Pathophysiological molecular mechanisms of obesity: A link between MAFLD and NASH with cardiovascular diseases.* International Journal of Molecular Sciences, 2021. **22**(21): p. 11629.

8. Chaudhari, H.E. and S.D. Patil, *Assessment of hazardous elements of metabolic syndrome in hypertensive patients to defend them from cardiovascular risk in tribal region.* Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 2019. **13**(2): p. 925-931.

9. Hembree, W.C., et al., *Endocrine treatment of gender-dysphoric/gender-incongruent persons: an endocrine society clinical practice guideline.* The Journal of Clinical Endocrinology & Metabolism, 2017. **102**(11): p. 3869-3903.

10. Michael, D., et al., *A randomised controlled study shows supplementation of overweight and obese adults with lactobacilli and bifidobacteria reduces bodyweight and improves well-being.* Scientific reports, 2020. **10**(1): p. 1-12.

11. Mukerjee, S., et al., *Polyunsaturated fatty acids mediated regulation of membrane biochemistry and tumor cell membrane integrity.* Membranes, 2021. **11**(7): p. 479.

12. Raphael, R.M., *Outer Hair Cell Electromechanics as a Problem in Soft Matter Physics: Prestin, the Membrane and the Cytoskeleton.* Hearing Research, 2021: p. 108426.

13. Baer, D.J., T. Henderson, and S.K. Gebauer, *Consumption of High-Oleic Soybean Oil Improves Lipid and Lipoprotein Profile in Humans Compared to a Palm Oil Blend: A Randomized Controlled Trial.* Lipids, 2021. **56**(3): p. 313-325.

14. Teh, S.S., et al., *Sn-2 hypothesis: a review of the effects of palm oil on blood lipid levels.* Journal of oleo science, 2018. **67**(6): p. 697-706.

15. Tao, D., P. Yang, and H. Feng, *Utilization of text mining as a big data analysis tool for food science and nutrition.* Comprehensive reviews in food science and food safety, 2020. **19**(2): p. 875-894.

16. Xiao, L., et al., *High-fat feeding rather than obesity drives taxonomical and functional changes in the gut microbiota in mice.* Microbiome, 2017. **5**(1): p. 1-12.

17. Kopp, W., *How western diet and lifestyle drive the pandemic of obesity and civilization diseases.* Diabetes, metabolic syndrome and obesity: targets and therapy, 2019. **12**: p. 2221.

18. Zuniga, K.E., et al., *Dietary intervention among breast cancer survivors increased adherence to a Mediterranean-style, anti-inflammatory dietary pattern: The Rx for Better Breast Health Randomized Controlled Trial.* Breast cancer research and treatment, 2019. **173**(1): p. 145-154.

19. Connealy, N., E. Piza, and D. Hatten, *The criminogenic effect of marijuana dispensaries in Denver, Colorado: A microsynthetic control quasi-experiment and cost-benefit analysis.* Justice Evaluation Journal, 2020. **3**(1): p. 69-93.

20. Kivimäki, M. and A. Steptoe, *Effects of stress on the development and progression of cardiovascular disease.* Nature Reviews Cardiology, 2018. **15**(4): p. 215-229.

21. Pinto, A., et al., *Dietary patterns at 7 year-old and their association with cardiometabolic health at 10 year-old.* Clinical Nutrition, 2020. **39**(4): p. 1195-1202.

22. Freeman, A.M., et al., *A clinician's guide for trending cardiovascular nutrition controversies: part II.* Journal of the American College of Cardiology, 2018. **72**(5): p. 553-568.

23. Sarker, U. and S. Oba, *Protein, dietary fiber, minerals, antioxidant pigments and phytochemicals, and antioxidant activity in selected red morph Amaranthus leafy vegetable.* PLoS One, 2019. **14**(12): p. e0222517.

24. Carvalho, M., B. Sepodes, and A.P. Martins, *Regulatory and scientific advancements in gene therapy: state-of-the-art of clinical applications and of the supporting European regulatory framework.* Frontiers in medicine, 2017. **4**: p. 182.