

Nursing Intervention Program Using Life Style Model for Clients with High Lipids Profile

Sahar M.M. Aly

Nursing Administration, Faculty of Nursing, Port Said University, Egypt
saharaly23@yahoo.com

Abstract: High blood cholesterol level is one of the major controllable risk factors for developing coronary heart disease, heart attack and stroke. So it is dependent on individual actions, including risk reduction, participation in screening efforts, and prompt attention to signs and symptoms to ensure early diagnosis and treatment. Through using epidemiological information can direct interventions to control health related conditions, by increase awareness, change behavioral habits about nutrition and dietary concept, encourage high risk people with high lipid profile for physical activities and weight control. The present study aims to improve clients with high lipids profile knowledge, and practices related to; nutrition, and physical activity, through using life style model. A quasi-experimental design was applied to achieve the aims of the study. The sample composed from (100 clients) with high lipids profile according to certain criteria, the study was carried out in AL Ismailia Branch of Health Insurance out patients clinics. Data collected through using three tools: first tool; structure interviewing questionnaire was developed to assess clients' knowledge and practices, and socio demographic characteristics; second tool, to assess clients' BMI, third tool, to assess clients' medical history and laboratory investigations, and program for clients with high lipids level designed and implemented to study group. The study showed that, improved knowledge level of the clients with high lipids, improved in behavioral habits of clients regarding nutritional habits, and physical activities. Changes in blood lipids level toward improvement from high levels to desirable normal and borderline high level. Also slightly improvement in BMI from moderate obese toward overweight and normal weight BMI. The study recommended to conduct further educational programs for clients with high lipids profile to raise their knowledge and practices toward high lipids, Supporting in-service training programs for health team, in counseling techniques and interpersonal communication skills are required for health care providers.

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Key words: cholesterol, lipids profile, physical exercise, dietary habits, DM, life style model

1- Introduction

High blood cholesterol is one of the major controllable risk factors for developing coronary heart disease, heart attack and stroke. It is important to find out cholesterol level because lowering cholesterol levels that are too high lessens the risk for developing heart disease and reduces the chance of a heart attack or dying of heart disease. Heart disease is the number one killer of women and men in the United States. Each year, more than a million Americans have heart attacks, and about a half million people die from heart disease, about two in three adults have a cholesterol level that is higher than recommended, (NIH, 2007)

Throughout the world, blood cholesterol levels vary widely. Generally, people who live in countries where blood cholesterol levels are lower, such as Japan, have lower rates of heart disease. Countries with very high cholesterol levels, such as Finland, also have very high rates of coronary heart disease. However, some populations with similar total cholesterol levels have very different heart disease rates. High cholesterol is more common in men younger than 55 years and in women older than 55 years. The risk for high cholesterol increases with age. (Atlas of Heart Disease and Stroke, WHO, 2010)

In USA, 102.2 million Americans age 20 and older have total blood cholesterol levels of 200 mg/dl or higher, 47.7 million men; 54.5 million women. (CDC, 2010; AHA, 2011), Each year, 500,000 Americans die of heart disease, and approximately half of them are women. 50% of men and 64% of women who die suddenly of heart disease have no previous symptoms of the disease, (American Heart Association, 2009). In Egypt; high cholesterol level estimated; (33.3% men, 43.7% women, total: 38.6%); mortality rate from cardiovascular diseases and DM (427.3/100,000 men), (384/100,000 women); obesity; (21.4% men, 44.5% women, total: 33.1%), (WHO, NCD country profile, 2011).

Preventing many of the chronic diseases is dependent on individual actions, including risk reduction, participation in screening efforts, and prompt attention to signs and symptoms to ensure early diagnosis and treatment. All health care providers are challenged to empower individuals to develop or modify lifestyle patterns that maintain health and prevent disease, (Longmore, *et al.*, 2006). The National Cholesterol Education Program, the American College of Cardiology, and the American Heart Association, recommend diet and lifestyle modification as the first

line of defense against abnormal blood lipids. These recommendations include a diet low in total fat, saturated fat, and cholesterol a diet high in fibers, weight loss or weight management increased physical activity, and smoking cessation, (National Cholesterol Education Program, 2008; NIH, 2006; NHLBI, 2011)

Nurse can use epidemiological studies to evaluate the quality of care, and apply epidemiological findings in the practice area. It is essential that incorporate study results into prevention programs for communities and at risk populations. further, the philosophy of public health and epidemiology dictates that nurses extend its application into major health policy decisions, because the aim of health policy planning is to achieve positive health goals and outcomes for improved societal health. Nurses collaborating with community members can combine epidemiological knowledge and aggregate-level strategies to affect change on the broadest scale, (Ashengrau, & Seage, 2008)

The "web of causation" model exploring the influence of multiple factors on the development of a specific health condition. which allows the epidemiologist to map the interrelationships among factors contributing to the development (or prevention) of a particular health condition. This approach also assists in determining areas when efforts at control will be most effective, (MacDonald, 2004; Friedman, 2005; Mary, 2008) Through using epidemiological information can direct interventions to control health related conditions, by increase awareness, change behavioral habits about nutrition and dietary concept, encourage high risk people with high lipid profile for physical activities and weight control, (Frances, & Claudia, 2005).

Aim of the study

The study aimed to measure the effect of the nursing intervention program using life style model for clients with high lipids profile in improving clients' health status.

Hypothesis:

The nursing intervention program by using life style model for clients with high lipids profile will: improve the clients' knowledge and practices related to behavioral habits; and control the clients' lipids profile to reach normal range.

Subjects and methods

2. Research design:

A quasi experimental design, was used to evaluate the effect of nursing intervention program using life style model for clients with high lipids profile.

Setting:

The study was conducted in outpatient clinics of medicine, and coronary heart disease, in Health Insurance Organization (HIO), AL Ismailia health insurance branch.

Sample:

A convenient sample was used. Total number were studied in this study, were (100 individuals; 68 males, and 32 females), according to following criteria; middle aged adult clients, both sexes "Males& females", suffering from high lipids profile level since one year, who have recorded personal health data in health insurance file.

2- Technical design

Three tools were used for data collection.

Tools of data collection:

1st tool appendix (1):

Structure interviewing questionnaire was developed by researcher in an Arabic language to assess clients' knowledge and practice based on literature review, it comprised three parts.

1. First part, to assess socio-demographic characteristics, such as: age, sex, marital status, residence, educational level, occupation.

2. Second part, that modified to assess clients' with high lipids knowledge, about quality of health , lipid and hyperlipidemia.

3. Third part, to assess clients' practices related to behavioral habits: nutritional, and physical activities by using Atlantic path questionnaire, which was modified from (Atlantic Path, 2009). Questionnaires about food group and quantities according to Canadian & American dietary guidelines for daily amount of food, (Canada's Food Guide, 2007; Janet & Jane, 2010). And questionnaires about physical activities; intensity and duration of physical exercises.

2nd tool; appendix (2):

To assess clients' Body Mass Index "BMI", through measuring clients' weight and height by calculating $[(\text{weight kg} / \text{height x height cm}^2) = \text{BMI}]$, which was adopted from (NIH, 2009).

3rd tool appendix (3):

To assess clients' medical history which registered in clients' personal health insurance file and measurement laboratory investigations (lipids level), according to (National Institute of Health,2005):

II. Operational design:

Pilot study:

A pilot study was carried out on 10 clients with high lipids level profile according to study inclusion criteria, were interviewed to test tools applicability, according to pilot study results modifications were done for some items. The studied sample included in the pilot study were excluded from the study sample.

Ethical considerations:

Prior to the study, a permission from clients to conduct the study has been taken. They were informed about, aims, methods, anticipated benefits and absence of potential hazards have to be explained to assure clients about the safety of the study, and to let them obtain real participation in the research process and to

inform them about their rights to terminate the session at any time.

Field work:-

Data collection was carried out in the period from December, 2010 and completed by June, 2011 in four phases. Official letters including the title and aim of the study were submitted to the director of Health Insurance Organization, and Director of AL Ismailia Branch for Health Insurance, to take an approval for data collection to conduct the study, then take approval from directors of outpatients clinics. Researcher prepare by making interview firstly with director and head nurse of the outpatient clinic to introduce the importance and aims of research then display the data show program for them. The program session usually was lasts between 30 and 45 minutes, conducted in a comfortable, quiet and dedicated time and space. Issues of confidentiality were confirmed. The total number of session was 5 sessions, (2) for theory and (3) for practice; each one take about 1.5 hour (about 3 hours theory, & 4.5 hours practice, total 7.5 hours). The clients interviewed in the outpatient clinics waiting room, 3 days per week, from 9am, to 2pm, at AL Ismailia Branch for Health Insurance outpatient clinics.

Start nursing intervention program by preparatory phase, gather all information and reviews about high lipids profile. Assessment phase by using data collection tools which comply with life style model factors related to high lipid profile, to assess clients' knowledge, practices related to behavioral habits; "nutrition, physical activities". Lipids level was registered for every participant in the first visit before start the nursing intervention program, then it was registered after finishing program to follow up changes in lipids level. Planning nursing intervention program for clients with high lipids profile by using suitable literature review and resources. Then Implementation of the nursing intervention program, in which clients divided to groups. Then finally make evaluation to assess and estimate program results.

3- Results of the study

Current study revealed that, majority of clients with high lipids level post nursing intervention program had good knowledge about meaning of quality of health care, meaning of lipids, meaning of hyperlipidemia, foods containing high lipids, lipids function, causes. The current study revealed that there was a significant difference between clients with high lipids level pre and post program.

The current study revealed that, there was a highly strong significant correlation difference between clients' educational level and their knowledge pre and post program. Also current study revealed that there was a highly strong significant correlation difference between clients' educational level and their lipids

profile level and body mass index pre and post program.

The current study revealed that, as regarding to clients' food group pre program; there were less than half consumed milk & milk products, two fifth consumed vegetables, and more than one fifth consumed meat/poultry. Also post program, for food group; there were majority always consumed grain products, and vegetables, while less than three quarters consumed fruit. There were half consumed fish, less than one third consumed milk & milk products, more than one fifth consumed meat/poultry.

Also as regarding food quantities pre program for previous food groups; there were less than two third consumed fish, more than one quarter consumed meat/poultry, one fifth consumed milk& milk products, and one fifth consumed oils & fats. Also post program, for food quantities; there were majority consumed always milk & milk products, and grain products, less than three quarters consumed vegetables, less than half meat/poultry, more than two fifth oils and fats. The current study revealed that, there was a strong significant correlation between clients' with high lipids level nutritional habits pre and post program; regarding to food group, and quantities.

The current study revealed that, there were less than two third of clients with high lipids always doing physical exercises post program while more that one tenth pre program. Current study revealed that, as regarding to intensity of physical exercise; there were one fifth post program while less than one tenth pre program always doing light exercises; more than one quarter post program while minority pre program always doing moderate exercises. Also as regarding to duration of exercise; there were less than one third post program while no one pre program for always doing exercise duration 10min : 20min.

The current study revealed that there was a significant difference in habitual physical exercise pre and post program, except in heavy intensity of exercise there is no significant difference. And there was a strong correlation between doing physical exercises, intensity of exercise and duration of exercise, pre and post program, while there was a weak correlation in duration of exercise more than 25 min pre and post program.

The current study revealed that, there was a highly significant strong correlation difference between clients' BMI "Body Mass Index" and physical exercise pre and post program. And there was a highly significant correlation difference between clients' physical exercises and clients' lipids level pre and post program. The current study revealed that, there was a highly strong significant correlation between clients' lipids level and Body Mass Index pre and post program.

Table (1): percentage distribution of clients as regarding to their knowledge about lipids and hyperlipidemia (pre & post) program (No.=100)

Items	Pre program				Post program				Chi square	P value
	Good (%)	Average (%)	Poor (%)	Mean ± Sd.	Good (%)	Average (%)	Poor (%)	Mean ± Sd.		
Meaning of quality of health care	18	28	54	1.6±0.8	90	2	8	2.8±0.6	104.7	0.007
Lipids:										
Meaning	21	30	49	1.7±0.8	73	15	12	2.6±0.7	56.2	0.000
Synthesis	11	20	69	1.4±0.7	70	10	20	2.5±0.8	73.3	0.00
Function	6	40	54	1.5±0.6	83	8	9	2.7±0.6	120.1	0.000
Types	12	28	60	1.5±0.7	59	19	22	2.4±0.8	50.4	0.000
Normal levels	18	24	58	1.6±0.8	62	35	3	2.6±0.5	75.8	0.000
Abnormal levels	8	14	78	1.3±0.6	69	27	4	2.6±0.6	119.2	0.002
Hyperlipidemia:										
Meaning	30	4	66	1.6±0.9	96	4	-	3±0.2	100.6	0.154
Causes	18	36	46	1.7±0.7	82	12	6	2.8±0.5	83.7	0.000
Common signs	20	22	58	1.6±0.8	50	20	30	2.2±0.9	21.9	0.000
Complications	10	27	63	1.5±0.7	78	10	12	2.7±0.7	95	0.000
Treating	14	20	66	1.5±0.7	67	12	21	2.5±0.8	60	0.000
Foods:										
Contain high lipids	13	3	84	1.3±0.7	87	10	3	2.8±0.4	133.9	0.125
Free from lipids	12	18	70	1.4±0.7	75	21	4	2.7±0.5	104.7	0.001

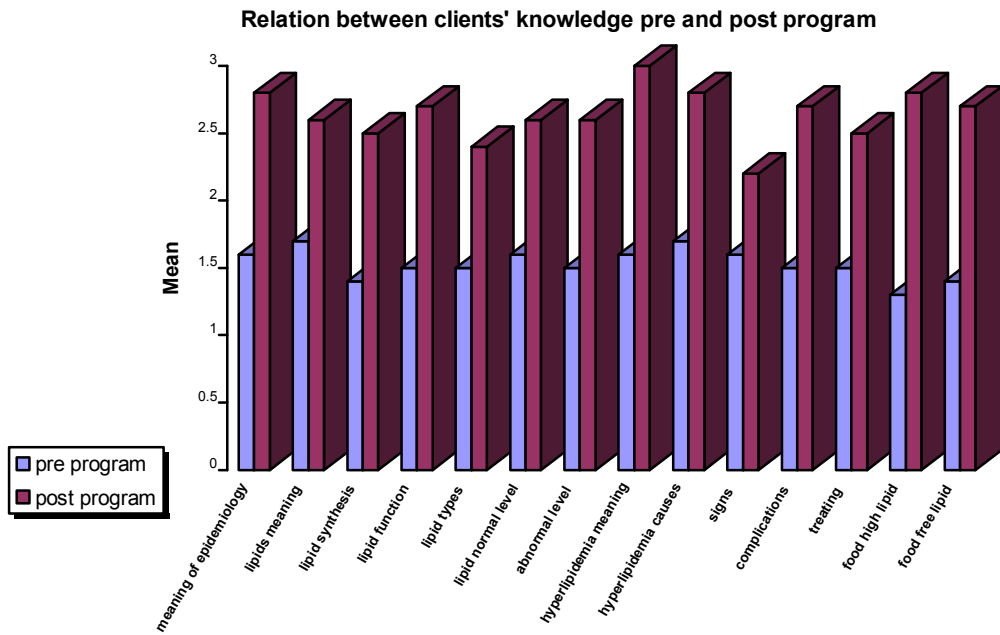
Table (2): Association between educational levels and clients' knowledge pre& post program (No.100)

Items	Pre program				Post program			
	Mean ± Std.	Chi square	r.	P value	Mean ± Std.	Chi square	r.	P value
Meaning of quality of health care	1.64±0.77	100.7	0.8	0.001	2.8±0.6	68.2	0.5	0.001
Lipids:								
Meaning	1.72±0.79	124.7	0.84	0.001	2.6±0.7	141.3	0.79	0.001
Synthesis	1.42±0.68	78.2	0.75	0.001	2.5±0.8	128.5	0.83	0.001
Function	1.52±0.6	68.2	0.73	0.001	2.7±0.6	89.5	0.66	0.001
Types	1.52±0.7	75.9	0.76	0.001	2.4±0.8	109.3	0.84	0.001
Normal levels	1.6±0.78	94.6	0.79	0.001	2.5±0.5	94.9	0.82	0.001
Abnormal levels	1.3±0.6	89.3	0.73	0.001	2.6±0.5	108.8	0.83	0.001
Hyperlipidemia:								
Meaning	1.6±0.9	80.5	0.76	0.001	3±0.2	25.6	0.32	0.001
Causes	1.7±0.7	117.6	0.84	0.001	2.7±0.5	84.1	0.67	0.001
Common signs	1.6±0.8	102.6	0.79	0.001	2.2±0.9	107	0.85	0.001
Complications	1.5±0.7	72.1	0.75	0.001	2.6±0.7	116.3	0.73	0.001
Treating	1.5±0.7	79.2	0.76	0.001	2.5±0.8	142.1	0.86	0.001
Foods:								
Contain high lipids	1.3±0.7	60.3	0.60	0.001	2.8±0.4	91.8	0.61	0.001
Free from lipids	1.4±0.7	80.6	0.75	0.001	2.7±0.5	86.7	0.76	0.001

Tab (3):Relation between clients' educational level and clients' lipids level and body mass index (No.100)

Items	Educational level		
	Mean± Std.	Corr.	Sig.
Lipids profile:			
Pre program	2.3 ± 0.76	0.86**	0.000
Post program	1.9 ± 0.77	0.93**	0.000
Body mass index:			
Pre program	2.9 ± 1	0.90**	0.000
Post program	2.7 ± 1.1	0.91**	0.000

**correlation is significant at the 0.01 level.



Figure(1): distribution of clients according to their knowledge

Table (4): significant correlation between clients' nutritional habits pre & post program (No. =100)

Items	t. test	Program		r.	P value
		Pre	Post		
		Mean ± Sd.	Mean ± Sd.		
Food group:					
vegetables	-10.65	3.01± 1	3.78± .54	.71	.000
Fruits	-14.48	2.43± 1.18	3.72± .45	.76	.000
Grain products	-12.55	2.82±.97	3.77± .65	.62	.000
milk, milk products and alternatives	9.56	3.07± 1.01	2.59± 1.15	.90	.000
meat/poultry	-	2.67± .99	2.67± .99	-	-
Fish	-13.74	2.29± 1.05	3.12± 1.08	.84	.000
Food Quantities:					
Vegetables	-13.22	2.43 ± 1.02	3.49 ±.96	.67	.000
Fruits	-12.31	2.32 ±1.16	3.54 ±.93	.57	.000
Grain products	-14.10	2.09 ±1.04	3.51 ±1.01	.52	.000
Milk, milk products and alternatives	-9.06	3.15 ±.95	3.82 ±.52	.63	.000
Meat/poultry	-4.78	2.61 ±1.05	2.91 ±1.24	.86	.000
Fish	-11.53	2.54 ±1.20	3.20 ±1.03	.88	.000
Oils and fats	9.56	3.45 ±.87	2.72 ±1.2	.77	.000

a. The correlation and t cannot be computed because the standard error of the difference is 0.

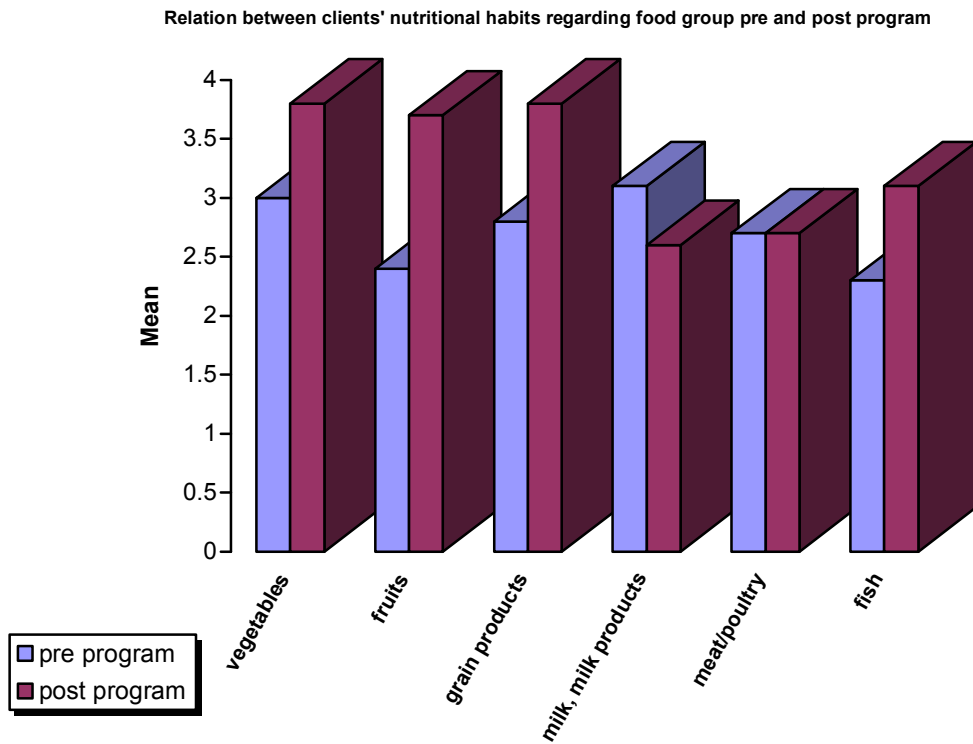


Figure (2): distribution of clients according to their nutritional habits "food group"

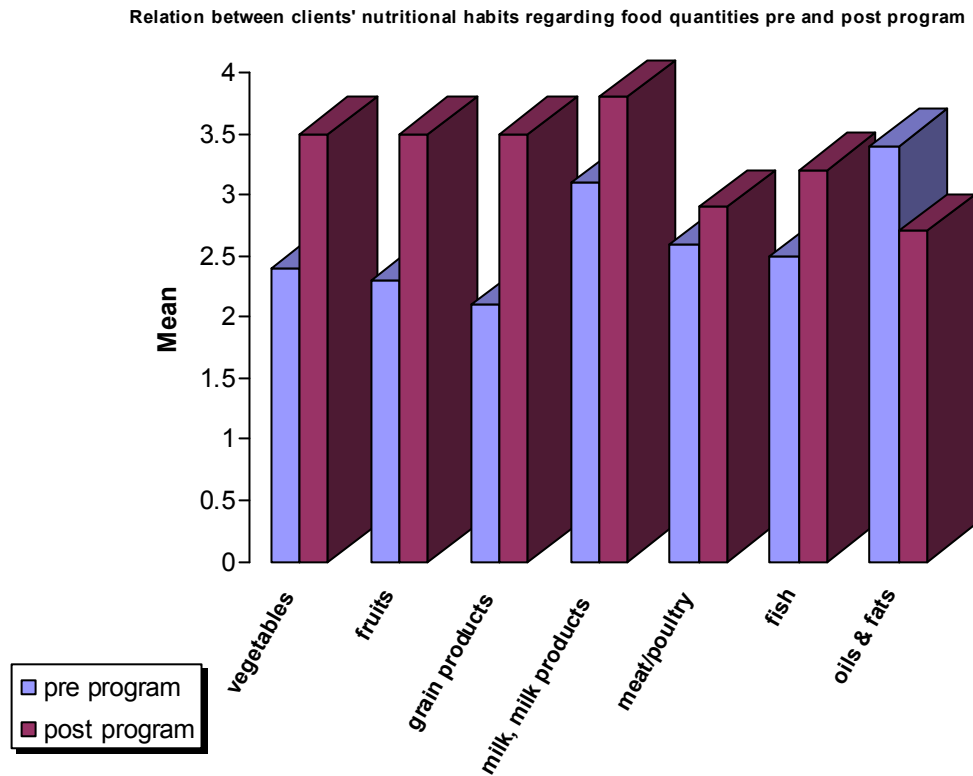


Figure (3): distribution of clients according to their nutritional habits "food quantities"

Table (5): percentage distribution of clients as regarding to their habitual physical exercises "pre& post" program (No.=100)

Items	Preprogram				Post program				Chi square	P value
	Never (%)	Rarely (%)	Sometimes (%)	Always (%)	Never (%)	Rarely (%)	Sometimes (%)	Always (%)		
Doing physical exercise	37	26	26	11	12	14	15	59	52.2	0.00
Intensity of exercise:										
Light	21	11	15	8	5	9	7	20	16.4	.001
Moderate	16	9	5	2	7	4	6	26	25	.00
Heavy	-	6	6	1	-	1	2	13	15.7	.082
Duration of exercise:										
5min to 10min	-	7	15	11	-	2	6	17	6.94	.03
10 min to 20 min	10	10	5	-	3	7	5	30	31.1	.00
More than 25 min	17	9	6	-	1	-	6	23	46.2	.044

Tab (6) Significance correlation between clients' behavioral habits related to physical exercises "pre & post" program (No.= 100)

Items	Pre	Post	T test	r.	P value
	Mean &SD	Mean & SD			
Doing physical exercises	2.11±1.034	3.21 ±1.085	-14.758-	.754	0.000
Intensity of exercise:					
Light	1.71 ±.814	3.02 ±1.107	-12.276-	.786	0.000
Moderate	1.78 ±.941	2.91 ±1.228	-7.642-	.735	0.000
Heavy	2.62 ±.650	3.69 ±.630	-6.062-	.500	0.000
Duration of exercise:					
5:10 min	2.84 ±.624	3.60 ±.645	-8.718-	.765	0.000
10:20 min	1.80 ±.764	2.88 ±1.092	-9.448-	.869	0.000
> 25 min	1.57 ±.728	3.70 ±.651	-15.056-	.371	0.000

Relation between clients' habitual physical exercises regarding its intensity pre & post program

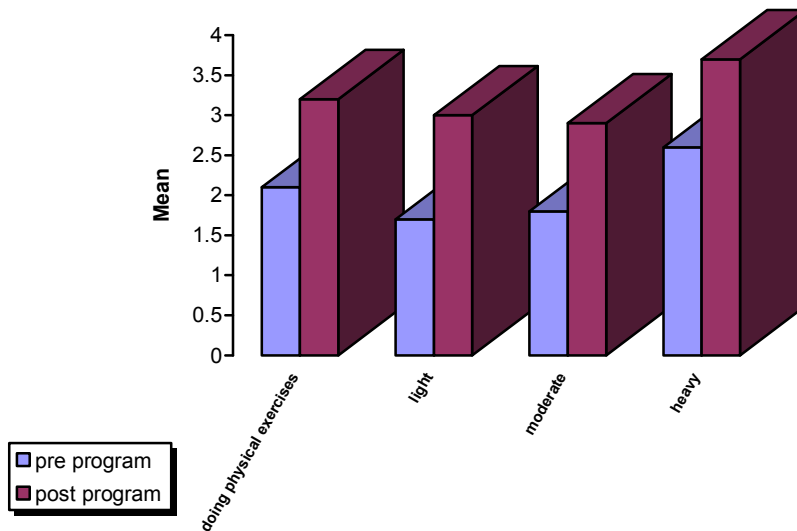


Figure (4): distribution of clients according to their intensity of physical exercises

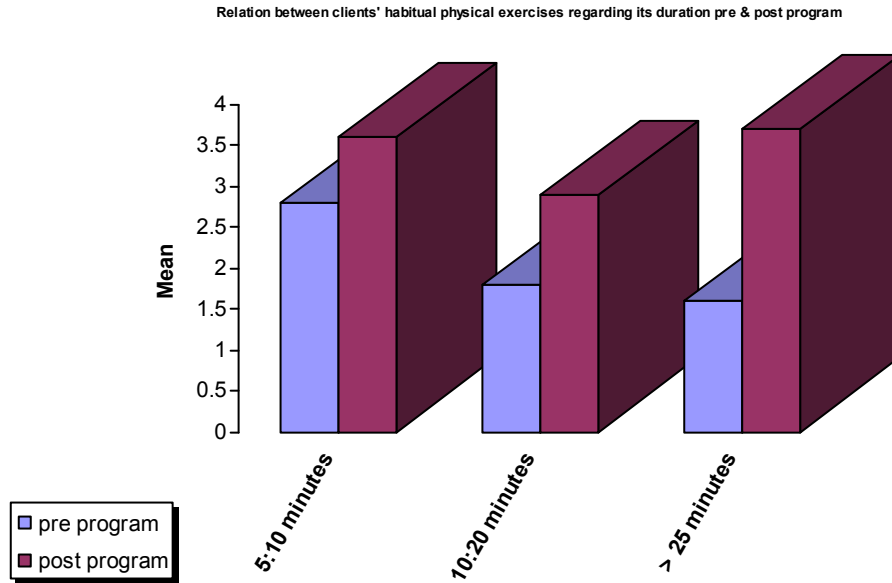


Figure (5): distribution of clients according to their duration of physical exercises

Table (7): Significant differences between clients' lipids level "pre and post" program (No.=100)

Items	Program	
	Pre %	Post %
Lipids profile level:		
Desirable	18	34
Borderline high	34	41
High	48	25
Mean ± Std.	0.15± 0.36	
Chi square	77.2	
Correlation	0.79	
P value	0.002	

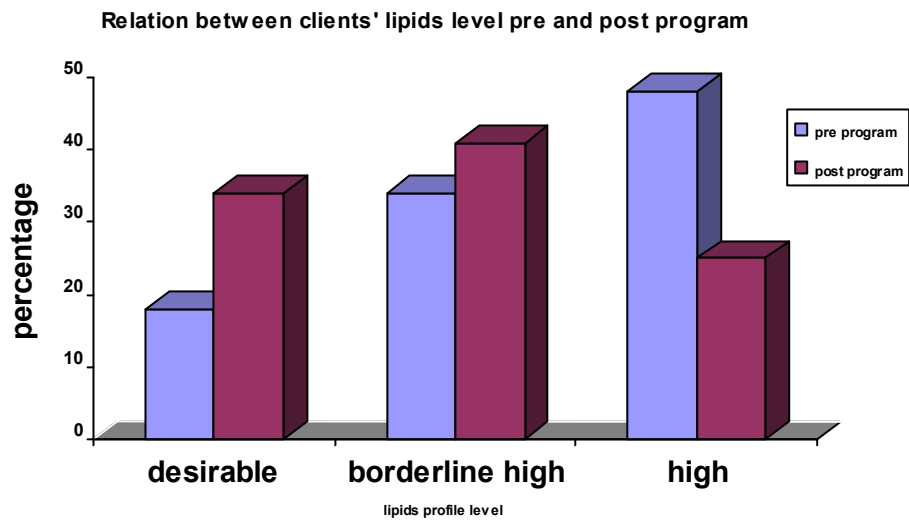


Figure (6): distribution of clients according to their lipids profile level

Table (8): Significant differences between clients' Body Mass Index measurement "BMI" "pre and post" program (No.=100)

Items	Program	
	Pre %	Post %
BMI		
18.5 - kg/m ²	6	13
25 - kg/m ²	31	29
30 - kg/m ²	40	37
35 - kg/m ²	13	12
> 40 - kg/m ²	10	9
Mean ± Std.	0.15± 0.36	
Chi square	276.5	
Correlation	0.947	
P value	0.000	

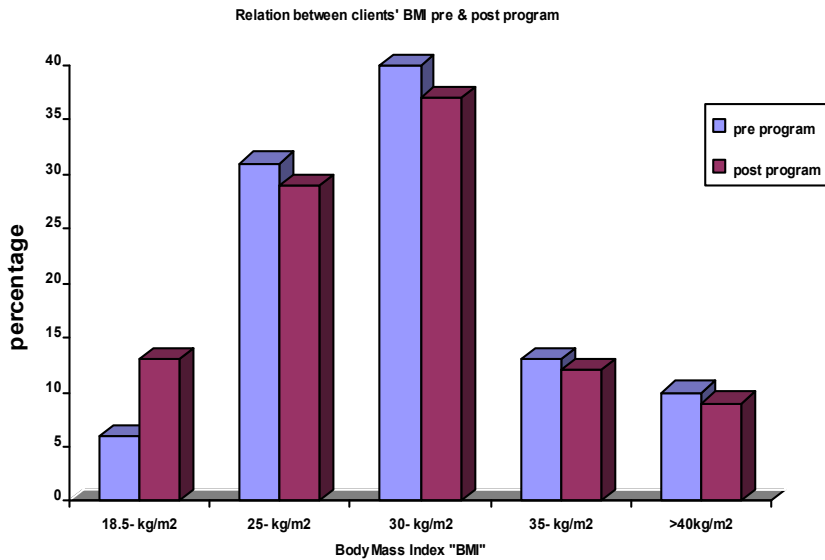


Figure (7): distribution of clients according to their BMI

Tab. (9): Relation between physical exercise and clients' body mass index pre &post program (No.=100)

Items	Body Mass Index "BMI"							
	Pre program				Post program			
	No.(%)	Mean ±sd.	r.	Sig.	No.(%)	Mean ± sd.	r.	Sig.
Intensity of exercise:								
Light	55	2.2±0.6	0.79**	0.001	41	1.7±0.5	0.88**	0.001
Moderate	32	1.8±0.4	0.40*	0.02	43	1.7±0.5	0.86**	0.001
Heavy	13	1.5±0.5	0.91**	0.001	16	1.2±0.4	0.21	0.42
Duration of exercise:								
5:10 min	33	1.8±0.4	0.72**	0.001	25	1.5±0.5	0.61**	0.001
10:20 min	25	1.7±0.4	0.60**	0.001	45	1.8±0.6	0.81**	0.001
> 25 min	32	1.8±0.4	0.41*	0.02	30	1.6±0.5	0.54	0.002

** Correlation is significant at the 0.01 level

* correlation is significant at the 0.05 level.

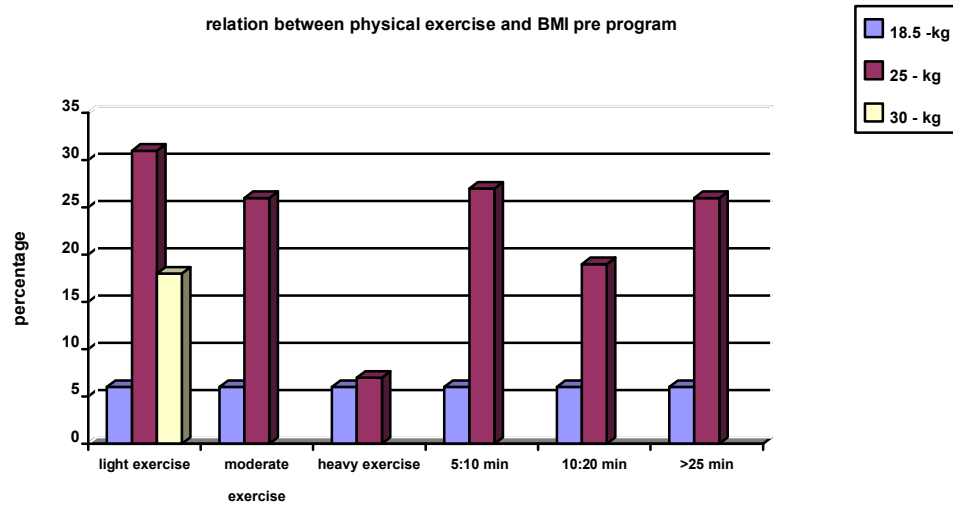


Figure (9): distribution of clients according to BMI and physical exercise pre program

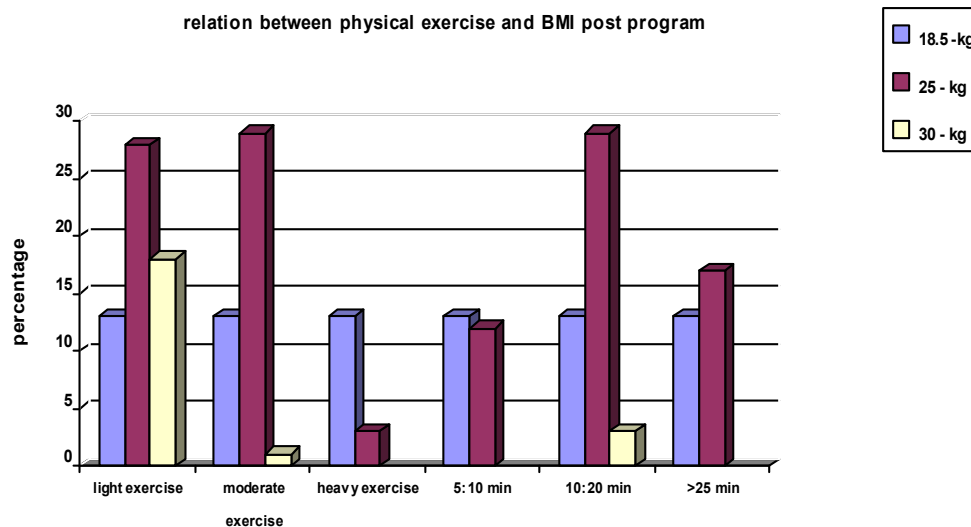


Figure (8): distribution of clients according to BMI and physical exercise post program

4. Discussion:

A high lipid is the major leading cause for coronary heart diseases, atherosclerosis, and stroke, it is the first one killer for both sexes, it is associated with several health conditions; overweight, hypertension. (Daniel, 2007). So the nursing intervention program will be able to improve clients' knowledge and correct the practices related to clients' behavioral habits related to nutrition, and physical activities, to control of high lipids profile.

In the current study, findings showed that, majority of clients have good knowledge about meaning of quality of health care, meaning of hyperlipidemia, foods contain high lipids, lipids function, hyperlipidemia causes post program, there

were significant difference between clients' knowledge about lipids and hyperlipidemia pre and post program, except there is no significant difference between clients' knowledge about hyperlipidemia meaning, and foods' contain high lipids pre and post program. This may be due to the majority of clients with hyperlipidemia were educated so they had availability to understanding and sharing in the interventional program, and understanding the importance, right effects of following up intervention program through upgrading their lifestyle on enhancing their lipids level and protection from coronary heart disease.

NCEP, 2008 cited that, the success of dietary intervention depends on the patient's knowledge, attitude and an effective behavioral modification

program. Increased knowledge among patients can improve their control of hyperlipidemia. Lower HDL cholesterol levels were found in low fat, high carbohydrate, and high sugar diets. Diets high in cholesterol and contain saturated fatty acids raise plasma cholesterol and LDL cholesterol levels. Whereas lower amounts of dietary cholesterol and saturated fats lower plasma cholesterol and LDL cholesterol levels. The NECP has thus recommended reducing the intake of dietary saturated fatty acid.

The current study revealed that regarding to food group there were less than half, two fifth, one third, and more than one fifth had always following food group; milk & milk products, vegetables, oils & fats, and meat/poultry respectively. Also regarding to food quantities, there were less than one third, more than one quarter, and one fifth had always following food quantities; respectively have always Food quantities of fish; meat/poultry, milk & milk products, and oils & fats, pre program. The current study revealed that regarding to food group there were majority of clients had always following food group; grain products, vegetables, and fruit, also half, one third, less than one third, and more than one fifth, had always following food group; fish, oils & fats, milk & milk products, meat/poultry respectively.

Also regarding to food quantities, there were majority had always milk & milk products, and grain products, less than three quarters had always vegetables, and less than half had always meat/poultry, and more than two fifth had always oils & fats, respectively, post program. The current study revealed that, there were strong significant correlation between clients' nutritional habits regarding to food group and quantities, pre and post intervention program.

Hata, and Nakajima, 2005, Study indicated the extent to which abnormalities of serum lipids are caused by a distorted life-style and the extent to which are improved by correction of the life-style and exercise or dietary therapy. Correction of the life-style as a non-drug therapy may clearly improve hyperlipidemia, concerning dietary habits, effects of dietary therapy or guidance were total cholesterol was reduced, triglycerides, and HDL-cholesterol was increased by restriction of fat intake or restriction of the intake of saturated fat and dietary cholesterol. (**Novakovi et al., 2009**), High energetic density of nutrition, insufficient physical activity and smoking are the most common causes of obesity and lipid metabolism disorders (hyperlipoproteinemia and dyslipoproteinemia).

Diaz et al., 2005, cited that, after adjustment for diet and other modifiable factors, decreased risk of hypercholesterolemia and low level of high-density lipoprotein but an increased risk of systolic hypertension. After controlling for dietary factors, ethnicity was associated with a lower risk of

hypercholesterolemia, lower level of high-density lipoprotein, and a greater risk of high systolic blood pressure. **Ferdowsian et al., 2009**, recommended diet as first-line therapy for patients with elevated plasma cholesterol concentrations, demonstrated that populations following plant-based diets, particularly vegetarian diets, are at lower risk for ischemic heart disease mortality, and effective in lowering plasma cholesterol concentrations. (**Wang et al., 2005**), Diet control significantly improves the status in control of hypercholesterolemia and thus should be reinforced in routine clinical practice.

Seki, and Yamaguchi, 2004, study effectiveness of educational program and the relationship between achievement of healthy eating patterns and reduction in blood cholesterol levels through assess eating patterns, change in eating behavior, advised to achieve healthy eating patterns and followed up with a nutritional consultation that was held after three months, The main results were serum cholesterol levels showed significant reduction. **Babio et al., 2009**, Study revealed that, dietary patterns "Mediterranean diet" rich in fruits and vegetables, nuts, olive oil, legumes and fish, moderate in alcohol and low in red meat, processed meat, refined carbohydrates and whole-fat dairy products, has favorable effect on lower cardiovascular disease risk, lower prevalence DM2 also improve atherogenic dyslipidemia. **Pan et al., 2011**, cited that, some positive dietary and behavioral changes; including an increased avoidance of products made from animal fats and oils' and a concomitant increase in the use of vegetable oil. Intakes of fruit and vegetables, soy products, fish, whole grains, nuts and seeds have also increased; and decreased intakes of red meat, carbohydrates and sodium containing foods. These positive dietary changes lead to decrease prevalence of hypertension and hypercholesterolemia.

Eilat, and Goldbourt, 2010, study supported that, food groups (whole grains, fruits, vegetables, fish, nuts, and soy), are recommended for reducing LDL-C and prevention of coronary heart disease. **Miliias et al., 2006**, reported that, food consumption patterns; consumption of fish, fruits and juices, cereals, and low fat milk and yogurt was significantly higher among hypercholesterolaemic participants while the opposite was observed for food items as red meat, pork, egg, full fat dairy products and desserts. **Campbell, and Thomas, 2008**, cited that consuming animal-based protein increases blood cholesterol levels. Saturated fat and dietary cholesterol also raise blood cholesterol. In contrast, plant-based foods contain no cholesterol and, in various other ways, help to decrease the amount of cholesterol made by the body.

Adebawo et al., 2006, Study shown association between vegetarian diet and low total serum cholesterol as well as LDL-cholesterol which is a pointer to low

risk of cardiovascular disease. Dietary fiber, antioxidants and other classes of nutrients have been reported to ameliorate cardiovascular risk factors. Fruits and vegetables being rich sources of fiber and antioxidants have been the focus in intervention studies. There were significant reductions in serum triglycerides; total serum cholesterol and LDL-cholesterol.

In the current study revealed that, less than two third always doing exercises post program while pre program were more than one tenth, regarding to intensity of exercises; one fifth always doing light exercise post program while less than one tenth pre program, also more than one quarter doing moderate exercises post program while minority pre program, as regarding to duration of exercise; less than two third doing 10min:20min post program while nothing pre program, less than one quarter do more than 25min post program while nothing preprogram, there was significant correlation difference in habitual physical exercise pre and post program, for both intensity and duration of exercise.

Coghill, and Cooper, 2008, cited that, increased physical activity may be an effective way to improve lipid profiles in hypercholesterolaemic individuals. Study revealed that, twelve weeks of moderate intensity walking was sufficient to improve TC/HDL-C in hypercholesterolaemic men, primarily through improvement in HDL-C. **Kligman, and Pepin, 2003**, cited that, regular exercise is an effective non-pharmacologic therapy for stress, sleep disorders, depression, and anxiety, as well as such chronic conditions of aging as hypertension, obesity, diabetes mellitus, coronary artery disease, hyperlipidemia, and constipation. (**Hata, and Nakajima, 2005**), study "Concerning exercise habit, regularly performed exercise (like walking) effects on serum lipids triglycerides were significantly lower, and HDL-cholesterol higher. The effects of harder exercise like jogging or swimming was Triglycerides decreased, and HDL-cholesterol elevated with an increase in the exercise intensity.

John et al., 2003, cited that, physically active women had significantly lower levels of total serum cholesterol, and higher levels of HDL cholesterol, similar associations were observed in men. (**Rauramaa and Väisänen, 2005**), revealed that, both regular moderate intensity physical activity and habitual dietary fat reduction decrease blood lipids thereby diminishing the risk of thrombosis and prevention of atherosclerotic diseases. (**Bassuk, and Manson, 2003**), suggested that as little as 30 minutes per day of moderate-intensity physical activity, including brisk walking, reduces the incidence of clinical cardiovascular events in men and women. Regular

exercise may also retard the progression of asymptomatic coronary and peripheral arteriosclerosis.

In the current study findings showed that, more than one third have desirable lipids profile level post program while less than one fifth pre program, two third had borderline high and high lipids profile post program while majority pre program, there was highly significant correlation difference between clients' lipids level pre and post program. That may be due to clients' awareness for following health guidance of nursing intervention program through change dietary habits (food group, & food quantities), regular as possible practicing physical exercise, and weight loss, so that appeared in changes in lipids level from high to border line high and to desirable lipids level which was optimal goal for the current research hypothesis to reach normal level.

Study by **Nakaya, 2005**, revealed that, dietary therapy and physical activity are cornerstones for lipid lowering and prevention of cardiovascular disease. The beneficial effect of physical activity may be mediated in several ways, such as reduction in VLDL, increase in HDL, reduction in body weight and reduction in blood pressure. **Njелеkela, et al., 2002**, suggested that, unhealthy diet and lower energy expenditure are important contributors to obesity and dyslipidemia. A simple correlation analysis showed that body mass index (BMI) correlated positively with the frequency of intake of coconut milk, fish and meat. Total cholesterol (TC) was negatively correlated with the frequency of intake of green vegetables, fish, and correlated positively with meat consumption and BMI in both genders.

In the current study findings showed that, more than one tenth have body mass index "BMI" (18.5- kg, normal weight) post program while less than one tenth pre program, more than one quarter had BMI (25- kg., over weight) post program, while less than two third post program, more than two third had BMI (30- kg., moderate obese) post program, while there were two fifth pre program. There is highly significant correlation difference between clients' body mass index pre and post program. The findings result changes in BMI (18.5- kg.; 25- kg.; and 30- kg.) which increased percentage for BMI (18.5- kg.), decreased percentage for BMI (25- kg., and 30- kg.) post program may be due to clients' had followed the current intervention program lines about important of consumption of some dietary content which decrease weight and fat deposition in the body as (fruit, vegetables, low fat milk products, vegetables oils instead of natural butter an margarines...); also habitual regular physical exercise, which all lead to changes in BMI and body weight.

A study by **Alnasir, and Masuadi, 2007**, revealed that, patients who completed designed

program for increase in physical activity and dietary readiness to control over-eating, had a reduction in body weight, body mass index, and lipid level. **Clarice et al., 2004**, cited that, prevalence of high blood cholesterol and mean levels of cholesterol were higher at BMI levels over 25 rather than below 25 but did not increase consistently with increasing BMI above 25. Rates of low HDL-C increased and mean levels of HDL-C decreased as levels of BMI increased.

In the current study findings showed that, there is highly significant correlation difference between clients' body mass index and physical exercises pre and post program. **Laust et al., 2006**, cited that, sedentary lifestyle did not predict changes in BMI, except when concurrent changes in physical activity were taken into account. **Klein et al., 2004**, evaluated the effect of weight loss on coronary heart disease risk factors and coronary heart disease, and provides practical weight management treatment guidelines for cardiovascular healthcare professionals. demonstrated that weight loss and physical activity can prevent and treat obesity-related coronary heart disease risk factors and should be considered a primary therapy for obese patients with cardiovascular disease. **Enrique et al., 2012**, cited that, physical activity index showed a significant correlation with aerobic capacity in both sexes, but not with the general strength index, there was a correlation between aerobic capacity and the general strength index, both in males, and females. **Mette et al., 2007**, cited that, there was a significant inverse association between average 24-hour physical activity level and waist circumference, BMI, waist-hip-ratio and triglycerides was found as well as a positive association with HDL, no association was found with total cholesterol, LDL, systolic or diastolic blood pressure

In the current study findings showed that, there was a highly significant correlation difference between clients' physical exercises and clients' lipids level pre and post program. **Crouse et al., 2005**, cited that, total cholesterol level fell after exercise there were significant changes. **Jaume et al., 2004**, determining the association of amount and intensity of leisure time physical activity with serum lipid profile and physical fitness which in accordance with the current study, Physical activity improves one's lipid profile and increases physical fitness. Physical activities were significantly associated with a higher level of high density lipoprotein (HDL) cholesterol and a lower atherogenic index (total cholesterol).

Fathi et al., 2009, results showed that physical activity can influence body composition and satisfactory effect on serum lipids, increased in physical activity decreased CHD risk factors, " TC were significantly low in who were active more than three days a week". The results showed that physical activity, was a significant relationship between sports and active life

style which help to improve and promote physical activity and lipoproteins. **Rosengren, & Wilheimsen, 2003**, reported a significant reverse relationship between physical activity and BMI which support the present research findings. **Reynage, 2005**, reported that, there was a significant reverse relationship between aerobic fitness and body weight, BMI, total cholesterol. **Enrique, et al., 2012**, revealed that, there was no relationship was found between the level of physical activity and lipid-metabolic index in either sex. Higher aerobic capacity and greater muscle strength were associated with lower lipid and metabolic risk factors for cardiovascular disease.

Conclusion

The current study illustrated that, after applying of nursing intervention program, the clients with high lipids level had raising in knowledge level about lipids and hyperlipidemia, also there was a statistical significant difference pre and post program, in the way of relation between educational level and knowledge level there was a significant correlation difference. As regarding to clients' behavioral habits regarding to nutrition, and physical exercises there were statistical significant correlation difference pre and post program. Also regarding to lipids profile level and BMI, there were statistical significant difference and appearing of changes in lipids level toward desirable normal level and borderline high, in which there were slight improving in lipids level and BMI.

Recommendation

In the view of the previous conclusion, the following recommendations are suggested:

For clients with high lipids level:

- Make periodical series health education program about; lipids and high lipids, and lifestyle modifications for clients to maintain lipids level about normal range and prevent any future complications.
- Enhance construct of a special unit specialized in giving health education and continuity of health education in out patient clinics, for increasing knowledge and follow up with nurses to communicate with attendants clients.

For nurse:

- Empower the role of nurse in the out patient clinics as health educator and counselor, for help in continuity of health program about high lipids risk factors and lifestyle modifications regarding nutrition habits, and physical exercise, and benefits of healthy heart food.
- Making health programs directed for outpatient nurses to empowering their role as health educators member by giving them up to date newly and recent knowledge about high lipids care at home and

how to follow up clients' behavioral attitudes related to nutrition, physical activities and overweight losing.

- Supporting in service training programs for health team, in counseling techniques and interpersonal communication skills are required for health care providers.

For community:

- Establishing Public awareness (media, social and sporting clubs) addressing the risks of overweight and providing lists of foods and drinks to avoid and the need for physical exercise.

- Educating public about the risks of sedentary lifestyle and benefits of simple physical activity. Schools and community organizations need to provide an environment that encourages and integrates physical activity into the daily lifestyle.

- Government should promote the development of parks, sporting clubs, facilities for bicycling, swimming.

- Media (TV, radio and press) should develop public awareness promoting heart healthy diet.

- Food services at worksites should make available selections low in saturated fat and calories and provide a lot of fruits, vegetables and grain products.

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