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RESEARCH ARTICLE

Effectiveness of selected Nursing intervention on bio physiological parameters in reduction of modifiable risks of cardio vascular diseases among young adults at selected hospital

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Abstract: CVD is globally considered as the leading importance cause of death with 80% of CVD related deaths being reported from low and middle class income countries like India. Study was focused to evaluate the effectiveness of selected Nursing intervention on bio physiological parameters in reduction of modifiable risks of cardiovascular diseases among young adults. True experimental – pre and posttest only design was adopted and simple random sampling technique was used for select the sample size. The sample size was selected by the structured interview questionnaire method which was 150 in the experimental group and 153 in the control group. After attrition the sample size was 150 in the experimental group and 150 in the control group. Study have been shown that regarding the comparison in the experimental and control group, the Extended McNemar's test revealed that there was no statistically significant difference in the mean of bio physiological parameters of CVDs risk with in experimental and control group in the pretest and also in posttest very high level statistical significance was found p<0.001 at SBP ((χ^2 =28.24), FBS ((χ^2 =15.73), PPBS ((χ^2=23.11) and LDL((χ^2=21.00) level proving the effectiveness of selected intervention package. The Chi square value was SBP ((χ^2=17.34), DBP(χ^2 =9.88), FBS(2 =9.13), PPBS(χ^2 =8.85) and HDL(χ^2=3.89) which showed p<0.01 moderately statistical significance between in the experimental and control group in the post test but there is no significant pretest. Statistically there is a significant difference between experimental and control group. It was calculated using chi-square test.

Keywords: CVD, risk factors, bio physiological factors, diet and exercise.

INTRODUCTION

Cardiovascular disease (CVD) is a general condition affecting the heart and blood vessels. It is usually affected and associated with a build-up of fatty deposits inside the arteries known as atherosclerosis and an increased risk of the blood clots. It could also be associated with damage to arteries in organs such as the heart, brain, heart, kidneys and eyes.[1] CVD is globally considered as the leading cause of death with 80% of CVD related deaths being reported from low- and middle-income countries like India, but it can often largely be prevented with a healthy lifestyle. Coronary atherosclerosis is a chronic disease with stable and unstable periods. During unstable periods with activated inflammation in the vascular wall, patients may develop CVD. After decades of study, risk factors for the development of atherosclerotic cardiovascular disease have been identified. These risk factors include older age, male sex, a positive family history, hypertension, dyslipidemia, diabetes, cigarette smoking, and obesity.[2]

Current study estimates from the GBD in the year 2010 indicate that CVD mortality are highest in South Asia, increasing by 87.8 percentages between 1990 and 2010, second only to East Asia. This is predicted to further higher to 50 percentages by the year 2030. CVD prevalence is presently twice as increased in urban compared to rural India (10–12% vs. 4–5%). With CVD rates are raising more quickly in urban versus rural areas and compounded by the current rapid rate of urbanization in India, this may reveal in an underestimation of CVD death rate projections. India experiences the highest number of potentially productive life years lost due to CVD; 9.2 million years in 2000, expected to double to 17.9 million years by 2030.[3]

Roy study was highlighted about the need for better health coverage, particularly in rural settings. "Rural health setups in India are not equipped to handle NCDs such as DM, HT and Heart Failure (HF), which need regular follow-up; they are more geared towards treating communicable diseases.[4]
The WHO-STEP wise Approach to Survillance (STEPS) method was used to record behavioural risk factors of anthropometry, BP, FBG and lipid profile. Multiple logistic regressions were used to assess the associations between the risk factors of CVD. [5] Varma study revealed that death rate due to CVD in Tamil Nadu was 360-430 per one lakh population and the increase in the state and 10.4 percent of population in the state suffers from 23 percent from overweight, 20%

from increased BP and Blood Sugar. Awareness would be created on CVD risk factors, signs and symptoms, benefits of regular screening and early detection of the problems.[6]

NEED FOR THE STUDY

CVD defines to a group of illnesses that have to do within the heart and the blood vessels that carry blood around the body. Some of these illnesses include: High blood pressure, coronary heart disease which includes heart attacks (HINDU, 2013).[7] The Risk factors are conditions or habits that make a person more likely to develop a disease. They can also increase the chances that an existing disease will get worse. Each risk factor greatly increases a woman's chance of developing heart disease. But having more than one risk factor is especially serious, because risk factors tend to "gang up" and worsen each other's effects. So, the message is clear: Every woman needs to take her heart disease risk seriously and take action now to reduce their risk (AHA, 2018).[8]

There are different determinants playing their part in raising the CVD. Though human being or biological determinant; cannot be differed. However, through proper implementation of programs, resources policies and modification of the behaviours, lifestyle and environment could lead them to reduce the CVD.[9]

Most of the studies reported significant positive effects of the health education interventions on cardiovascular risk factors, mainly on lipid profile, blood pressure and cardiovascular risk score.

The Centers for Disease Control and Prevention (CDC) recommends the following steps to prevent CVD:

1. Eat a diet high in fibre and low in fat,cholesterol, and sugar. Fresh vegetables and fruits are generally very good.
2. Maintain the healthy body weight by exercises.
3. The Physical exercise should be done regularly according to Surgeon General of the US recommends 2 hours and 30 minutes of moderate exercise such as fast walking or bicycling for each week for adults which reports by CDC guidelines. One hour of exercise per day is recommended for adolescents.
4. Reduce the alcohol amount consumption to no more than 14 drinks per week for men and seven drinks per week for women.
5. If smoker, quit smoking immediately because this is an especially high risk factor.
6. Have cholesterol levels monitored regularly and do the routine health screenings.
7. Check BP regularly. The CDC said that health-care provider should check BP at least every two years.
8. At risk for DM, should get tested periodically. If DM diagnosed, carefully do the follow up and treatment plan to keep the glucose levels in a normal range.[10]

The epidemic requires the development of strategies includes; the formulation and effective implementation of EBP, monitoring the reinforcement of health system services, emphasis on early detection and management of both conventional and innovative techniques for prevention of CVD.[11]

The health education interventions in primary care, seem to improve daily physical activity, cardiovascular risk factors and risk score (WHO, 2013).[12] Also the investigator had personal experience of witnessing the clients with risk factors like diabetes mellitus, hypertension, obesity, smoking, alcoholism and tobacco chewing. So this scenario motivated investigator to conduct the study on reduction of modifiable risks of CVD among young adults at selected hospital.

OBJECTIVES OF THE STUDY

1. To assess the bio physiological parameters in reduction of modifiable risks of cardiovascular diseases among young adults in experimental and control group.
2. To evaluate the effectiveness of selected nursing intervention on bio physiological parameters in reduction of modifiable risks of cardiovascular diseases among young adults in experimental and control group.
3. To associate the post-test mean difference level of bio physiological parameters in reduction of modifiable risks of cardiovascular diseases among young adults with their selected demographic variables of experimental and control group.

NULL HYPOTHESES

NH_1: There is no significant difference between the pre and post test level of bio physiological parameters in reduction of modifiable risks of cardiovascular diseases.

NH_2: There is no significant correlation between bio physiological parameters in reduction of modifiable risks of cardiovascular diseases among young adults in experimental and control group.

NH_3: There is no significant association of mean differed level of bio physiological parameters in reduction of modifiable risks of cardiovascular diseases among young adults with their selected demographic variables of experimental and control group.

MATERIAL AND METHODS:

The quantitative research approach with true experimental – pre and post-test only design was adopted. The study was conducted at selected hospitasl, in the state of Gonda, India. The researcher was selected two units (Experimental and Control group) with the distance of 6 kilometres in between Lucknow. The sample size was Maximum of 240 adults which were 120 in the experimental group and 120 in the control group by adopting the cluster sampling technique was used to select the samples for

experimental and control group by power analysis determination.

Development and description of the tool

Section A: Screening the young adults to identify the modifiable risks of CVDs by modified framingham10 years cardiovascular risk assessment tool (Age, HDL, total cholesterol, blood pressure, blood sugar and tobacco use.

Section B: Background variables of modifiable risks of cardiovascular diseases:

Score	Level of CVD risk
<12	Low risk
13-18	Mild risk
19-24	Low Moderate risk
25-30	Moderate risk
>30	High moderate risk

(a)Demographic Variables

Age, gender, religion, education status, type of occupation, type of work pattern, marital status, place of residence, type of family and family monthly income.

(b) CVD Risk Variables

Type of food, duration of activity per day, transport to office/outside, time spent leisure activities/ week, work in night shift, interrupted sleep pattern, family history of alcohol use, habit of alcoholism, age of onset of alcoholism, cut down on alcoholism ,family history of tobacco chewing or smoking use, habit of smoking use, age of onset of smoking use, type of smoking, attempts to quit smoking use, habit of other type of tobacco using, type of tobacco chewing, family history of heart disease, history of chronic disease, type of chronic disease, master health up regularly, how often do you check. Assessment of the bio physiological parameters of modifiable risks of CVDs by CVD risk assessment tool. (Body Mass Index, waist circumference, blood pressure, blood sugar, total cholesterol, HDL, LDL,VLDL and triglyceride). The Tool was prepared by the researcher with the standardized measurement score. Maximum score was 36 and minimum score was 0. The raw score was converted to percentage to interpret the level of reduction of bio physiological parameters of modifiable cardiovascular risk.

Intervention tool

The Selected Nursing intervention tool includes a) Nurse led education, b) Nurse led discussion and c. Nurse led demonstration on modifiable risks of CVD.[13]

Nurse led education: Knowledge regarding CVD education was given by Power point presentation. It was conducted for 30-45 min among group of 10-15 Young adults. It includes the following contents:

- General assessment of CVD
- Risk factors of CVD
- Signs and symptoms of CVD
- Diagnostic evaluation of CVD
- Prevention of CVD and
- Lifestyle modification of CVD.

Nurse led discussion: Healthy lifestyle pattern was discussed by providing booklet and clarifying the doubts about life style pattern to every participant. It was discussed nearly for 30- 45 min among group of 10-15 Young adults. The follow up of lifestyle pattern was assessed by end of the fourth month as follows them.

The booklets contents included:

- **A**erobic exercises
- **B**eat stress and
- **C**essation of tobacco, smoking and alcohol by motivational interviewing which includes counseling and guidance.
- **Diet control**

Nurse led demonstration: The video was prepared by the investigator to demonstrate the different methods of yoga for 30-45 min for group of 10-15 young adults.

The video demonstrations includes following:

- Warm up exercises
- Risk reduction exercises
- Breathing exercises
- Meditation and
- Cool down exercises

Self monitoring chart was monitored weekly after the intervention by in person and through telephonic communication and reinforcement was done about healthy diet, regular exercises, stress reduction and cessation of ill habits.[14]

PLANS FOR DATA ANALYSIS

Data collection was analyzed by using descriptive and inferential statistics[15]

Descriptive Statistics

Frequency and percentage distribution was used to analyze the background variables. Frequency, percentage distribution, Mean and standard deviation was used to analyze the pre and post-test level of bio physiological parameters among adults with modifiable risks of CVDs.

Inferential Statistics

't' test was used to assess the effectiveness of Selected Nursing intervention on reduction of modifiable risks of CVDs. t- test was used to find the mean difference in the level of bio physiological parameters in the experimental and control group. Correlation coefficient was assessed by Karl Pearson correlation coefficient to find the relationship between the level of bio physiological parameters in the experimental and control group. Chi square test was used to find out the association of the level of bio physiological parameters with their selected variables in the experimental and control group.

RESULTS AND DISCUSSIONS:

Screening of CVD risks using modified Framingham 10 years CVD risk assessment among adults

Study have shown that majority of 33 % age were 35-39 yrs, 65.06 % were gender 39 % had HDL of 45 -49 mg/dl,57.77% had total Cholesterol of < 160 mg/dl, 30.00% had blood pressure (SBP), 86.06 % had no blood sugar and 88.56% had no tobacco use.

Demographic characteristics of study participants

The experimental group 53.7% of participants were in the age group of 31-40 years, 72.8% of female were in the study. Around 77.7% of the study participants belongs to Hindu religion, 22.7% of adults had middle school of education 35.7% of the adults occupation were unemployed and 52.0% of work pattern were heavy worker. Around 70.7% of marital status were married, 61.3% of adults place of residence had own family, 66.0% of adults were in nuclear family adults and 30.7% of adults had monthly income Rs.11817-15753. In the control group 56.7% of participants were in the age group of 31-40 years,77.3% of female were in the study. Around 67.3% of the study participants belongs to Hindu religion, 25.3% of adults had high school of education. 31.3% of the adults were semiskilled worker and 48.0% of work pattern were heavy worker. Around 67.3% were married, 65.3% of adults place of residence were own family, 59.3% of adults had nuclear family and 34.7% of adults had monthly income Rs.11817-15753.

1. Assessment of bio physiological parameters among young adults with modifiable risk of CVD in experimental and control group.

1.1.(a): Frequency and percentage distribution of pre and posttest level of bio physiological parameters Body Mass Index in experimental and control group.

N=300

Body Mass Index		Group			
		Experimental		Control	
		n(150)	%	n(150)	%
Pre test	Normal	43	28.67	48	32.00
	Over weight	64	42.67	68	45.33
	class I obesity	36	24.00	25	16.67
	class II obesity	7	04.67	9	06.00
Post test	Normal	63	42.00	51	34.00
	Over weight	57	38.00	65	43.33
	class I obesity	25	16.67	25	16.67
	class II obesity	5	2.22	9	06.00

The above table 1.1.(a) shows the frequency and percentage distribution of pre and post test level of bio physiological parameters Body Mass Index in experimental and control group. The findings revealed that in the pre-test in both groups majority were overweight. In the post test 63(42.0%) had normal Body Mass Index, in the experimental group and 65(43.33%) had over weight in the control group.

1.2.(b): Frequency and percentage distribution of pre and post test level of bio physiological parameters Waist Circumference in experimental and control group.

N=300

Waist Circumferences		Group							
		Experimental (n=150)				Control (n=150)			
		Male (n)	%	Female (n)	%	Male (n)	%	Female(n)	%
Pre test	Normal	6	04.0	3	2.0	2	1.3	2	01.3
	Low risk	16	10.7	20	13.3	8	5.3	36	24.0
	High risk	11	07.3	40	26.7	13	8.7	31	20.7
	Metabolic syndrome	10	06.7	44	29.3	11	7.3	47	31.3
Post test	Normal	7	04.6	5	3.3	3	2.0	4	02.7
	Low risk	13	08.7	34	22.7	8	5.3	36	24.0
	High risk	12	08.0	31	20.7	10	6.7	32	21.3
	Metabolic syndrome	11	07.3	37	24.7	13	8.7	44	29.3

The above table 1.2.(b) shows the frequency and percentage distribution of pre and post test level of bio physiological parameters waist circumference in experimental and control group. The findings revealed that in the pre test majority of male 16(10.7%) had low risk and 44(29.3%) female had metabolic syndrome of waist circumference and similarly in

post test in experimental 13(8.7%) had low risk and 37(24.7%) had metabolic syndrome of waist circumference and control group whereas in the post test 13(8.7%) had high risk of waist circumference and in the post test maximum had metabolic syndrome of waist circumference, male had 13(8.7%) and female had 44(29.33%) in the control group.

1.3.(c): Frequency and percentage distribution of pre and post test level of bio physiological parameters Blood Pressure in experimental and control group.

N=300

Blood Pressure		Group							
		Experimental (n=150)				Control (n=150)			
		SBP (n)	%	DBP (n)	%	SBP (n)	%	DBP (n)	SBP (n)
Pre test	Normal	23	15.33	71	47.33	15	10.00	73	48.67
	Pre Hypertension	32	21.33	25	16.67	34	22.67	27	18.00
	Stage I Hypertension	26	17.33	20	13.33	29	19.33	25	16.67
	Stage II Hypertension	69	46.00	34	22.67	72	48.00	25	16.67
Post test	Normal	29	19.33	89	59.33	17	11.33	74	49.33
	Pre Hypertension	49	32.67	25	16.67	36	24.00	28	18.67
	Stage I Hypertension	35	23.33	16	10.67	29	19.33	26	17.33
	Stage II Hypertension	37	24.67	20	13.33	68	45.33	22	14.67

The above table 1.3(c) shows the frequency and percentage distribution of pre and post test level of bio physiological parameters blood pressure in experimental and control group. The findings revealed that in the pre test majority of participants 69(46%) had stage II hypertension of SBP and in post test 72(48%) had stage II hypertension of SBP and in post test in control group 68(45.33%) had stage II hypertension of SBP.

1.4(d): Frequency and percentage distribution of pre and post test level of bio physiological parameters Blood Sugar in experimental and control group.

N=300

Blood sugar		Group							
		Experimental (n=150)				Control (n=150)			
		FBS (n)	%	PPBS (n)	%	FBS (n)	%	PPBS (n)	%
Pre test	**Normal**	132	88.00	68	45.0	133	88.6	71	47.3
	Impaired glucose tolerance	7	4.7	74	49.3	8	5.3	73	48.7
	Possible DM	5	3.3	4	2.6	5	3.3	3	2.0
	DM	6	4.0	4	2.6	4	2.7	3	2.0
Post test	**Normal**	146	97.3	98	65.3	133	88.7	74	49.3
	Impaired glucose tolerance	2	1.3	48	32.0	12	8.0	70	46.7
	Possible DM	1	0.7	2	1.3	3	2.0	4	2.7
	DM	1	0.7	2	1.3	2	1.3	2	1.3

The above table 1.4(d) shows the frequency and percentage distribution of pre and post test level of bio physiological parameters blood sugar in experimental and control group.

The findings revealed that in pre and post test in both groups majority had a normal FBS and PPBS level in experimental and control group. Only in pre test alone, majority of PPBS, 74 (49.3%) had impaired glucose tolerance in the experimental group.

1.5(e): Frequency and percentage distribution of pre and post test level of bio physiological parameters Hyperlipidemia in experimental group.

N = 150

Level of Hyperlipidemia	TC		Triglyceride		LDL		VLDL		HDL	
	n	%	n	%	n	%	n	%	n	%
Pretest										
Normal	83	55.3	46	30.7	88	54.00	128	85.33	103	68.7
Borderline risk	54	36.0	71	47.3	52	38.67	12	8.00	34	22.7
High risk	8	5.3	30	20.0	5	04.00	6	4.00	4	2.6
Very high risk	5	3.3	3	2.0	5	03.33	4	2.00	9	6.0

Post Test										
Normal	95	63.3	67	44.67	100	66.7	137	91.33	123	82.0
Borderline risk	47	31.3	58	38.67	47	31.3	10	6.67	21	14.0
High risk	5	3.3	25	16.67	2	1.3	4	2.00	2	1.3
Very high risk	3	2.0	0	0	1	0.7	2	1.33	4	2.7

The above table 1.5(e) shows the frequency and percentage distribution of pre and post test level of bio physiological parameters, hyperlipidemia in experimental group. The findings revealed that in pre and post test in experimental group majority had a normal range of the TC, LDL, VLDL and HDL level and only in pre test, Triglyceride level 71(47.3%) had borderline high in experimental group.

1.6.(f): Frequency and percentage distribution of pre and post test level of bio physiological parameters Hyperlipidemia in control group.

N=150

Level of Hyperlipidemia	TC		Triglyceride		LDL		VLDL		HDL	
	n	%	n	%	n	%	n	%	n	%
Pretest										
Normal	85	56.6	48	32.0	86	57.3	130	86.7	116	77.3
Borderline risk	57	38.0	70	46.7	58	38.7	8	5.3	14	9.3
High risk	3	2.0	25	16.7	3	2.0	7	4.7	16	10.7
Very high risk	5	3.3	7	4.7	3	2.0	5	3.3	4	2.7
Post test										
Normal	89	59.3	51	34	86	57.3	132	88.0	118	78.7
Borderline risk	54	36. 0	68	45.3	60	40.0	7	4.7	17	11.3
High risk	5	3.3	25	16.7	2	1.3	6	4.0	13	8.7
Very high risk	2	1.3	8	5.3	2	1.3	5	3.3	2	1.3

The above tables 1.6 (f) show the frequency and percentage distribution of pre and post test level of bio physiological parameters hyperlipidemia in control group. The findings revealed that in pre and post test in both groups majority had a normal range of the TC, LDL, VLDL and HDL level and only in pre and post triglyceride level had 70(46. 7%) and 68(45.3%) borderline high in control group.

Table 2.Frequency and percentage distribution of overall pre and post test level of bio physiological parameters in experimental and control group.

N=300

Level of bio physiological parameters parameters		Group			
		Experimental		Control	
		n	%	n	%
Pre test	No risk	0	0.00	0	00.00
	Mild risk	110	73.33	121	80.67
	Moderate risk	31	20.67	22	14.67
	High risk	9	06.00	7	04.66
	Overall	**150**	**100**	**150**	**100**
Post test	No risk	0	00.00	0	00.00
	Mild risk	139	92.67	125	83.33
	Moderate risk	8	05.33	18	12.00
	High risk	3	02.00	7	04.67
Overall		**150**	**100**	**150**	**100**
Extended McNemar's test		**$\chi 2$=20.58 P<0.001***(S)**		$\chi 2$=2.18 P>0.53(NS)	

P>0.05 not significant ***P<0.001 very high significant NS=not significant S=Significant

The above table 2 shows the assessment of overall pre and post test level of bio physiological parameters in experimental and control group. The findings revealed that in pre test majority were categorized under mild risk of modifiable risks CVDs in both experimental and control groups. In post test majority were categorized under mild risk of modifiable risks CVDs in both experimental and control groups.

Statistically there is a significant difference between experimental and control group. It was calculated using Extended McNemar's test.

Table 3. Comparison of pre test level of bio physiological parameters reduction scores between experimental and control group N=300

Bio physiological parameters		Pre test				Chi square test
		Experimental (n=150)		Control (n=150)		
		n	%	n	%	
BMI	Normal	43	28.67	48	32.00	χ^2=2.63 P>0.45(NS)
	Over weight	64	42.67	68	45.33	
	class I obesity	36	24.00	25	16.67	
	class II obesity	7	04.67	09	06.00	
WC	Normal	6	04.00	04	02.67	χ^2=1.72 P>0.63(NS)
	Low risk	36	24.00	44	29.33	
	High risk	51	34.00	44	29.33	
	Metabolic syndrome	57	38.00	58	38.67	
SBP	Normal	23	15.33	15	10.00	χ^2=2.11 P>0.83(NS)
	Pre Hypertension	32	21.33	34	22.67	
	Stage I Hypertension	26	17.33	29	19.33	
	Stage II Hypertension	69	46.00	72	48.00	
DBP	Normal	71	47.33	73	48.67	χ^2=4.88 P>0.30(NS)
	Pre Hypertension	25	16.67	27	18.00	
	Stage I Hypertension	20	13.33	25	16.67	
	Stage II Hypertension	34	22.67	25	16.67	
FBS	Normal	132	88.00	133	88.6	χ^2=0.27 P>0.87(NS)
	Impaired glucose tolerance	7	4.7	8	5.3	
	Possible DM	5	3.3	5	3.3	
	DM	6	4.0	4	2.7	
PPBS	Normal	68	45.0	71	47.3	χ^2=0.35 P>0.87(NS)
	Impaired glucose tolerance	74	49.3	73	48.7	
	Possible DM	4	2.6	3	2.0	
	DM	4	2.6	3	2.0	

P>0.05 not significant NS=not significant S=Significant

Table 3 shows the Comparison of pre test level of bio physiological parameters reduction scores between experimental and control group. There is no statistically significant difference between the experimental and control group in pre test.

Table 4.: Comparison of pre test level of bio physiological parameters reduction scores between experimental and control group. N=300

Bio physiological parameters		Pre test				Chi square test
		Experimental (n=150)		Control (n=150)		
		n	%	n	%	
TC	Normal	83	55.3	85	56.6	χ^2=1.29 P>0.52(NS)
	Borderline risk	54	36.0	57	38.0	
	High risk	8	5.3	3	2.0	
	Very high risk	5	3.3	5	3.3	
Triglyceride	Normal	46	30.7	48	32.0	χ^2=0.06 P>0.97(NS)
	Borderline risk	71	47.3	70	46.7	
	High risk	30	20.0	25	16.7	
	Very high risk	3	2.0	7	4.7	
LDL	Normal	88	54.00	86	57.3	χ^2=0.12 P>0.94(NS)
	Borderline risk	52	38.67	58	38.7	
	High risk	5	04.00	3	2.0	
	Very high risk	5	03.33	3	2.0	
VLDL	Normal	128	85.33	130	86.7	χ^2=0.99 P>0.60(NS)
	Borderline risk	12	8.00	8	5.3	
	High risk	6	4.00	7	4.7	
	Very high risk	4	2.00	5	3.3	
HDL	Normal	103	68.7	116	77.3	χ^2=3.16 P>0.94(NS)
	Borderline risk	34	22.7	14	9.3	
	High risk	4	2.6	16	10.7	

	Very high risk	9	6.0	4	2.7	

P>0.05 not significant NS=not significant

The above table 4 shows the comparison of pre test level of bio physiological parameters reduction scores between experimental and control group. There is no statistically significant difference between the experimental and control group in pre test.

Table 5. Comparison of Post test level of bio physiological parameters reduction scores between experimental and control group.

Bio physiological parameters		Post test				Chi square test
		Experimental (n=150)		Control (n=150)		
		n	%	n	%	
BMI	Normal	63	42.00	51	34.00	χ^2=2.93 P>0.40(NS)
	Over weight	57	38.00	65	43.33	
	class I obesity	25	16.67	25	16.67	
	class II obesity	5	03.33	9	06.00	
WC	Normal	12	08.00	7	04.67	χ^2=2.19 P>0.53(NS)
	Low risk	47	31.33	44	29.33	
	High risk	43	28.67	42	28.00	
	Metabolic syndrome	48	32.00	57	38.00	
SBP	Normal	29	19.33	17	11.33	**χ^2=19.33 P<0.01**(S)**
	Pre Hypertension	49	32.67	36	24.00	
	Stage I Hypertension	35	23.33	29	19.33	
	Stage II Hypertension	37	24.67	68	45.33	
DBP	Normal	89	59.33	74	49.33	**χ^2=9.78 P<0.04*(S)**
	Pre Hypertension	25	16.67	28	18.67	
	Stage I Hypertension	16	10.67	26	17.33	
	Stage II Hypertension	20	13.33	22	14.67	
FBS	Normal	146	97.3	133	88.7	**χ^2=9.03 P<0.01**(S)**
	Impaired glucose tolerance	2	1.3	12	8.0	
	Possible DM	1	0.7	3	2.0	
	DM	1	0.7	2	1.3	
PPBS	Normal	98	65.3	74	49.3	**χ^2=7.85 P<0.02*(S)**
	Impaired glucose tolerance	48	32.0	70	46.7	
	Possible DM	2	1.3	4	2.7	
	DM	2	1.3	2	1.3	

P>0.05 not significant *P<0.05 significant ** P<0.01 high significant NS=not significant S=Significant

The above table 5 shows the comparison of post test level of bio physiological parameters reduction scores between experimental and control group.

In post test, there is a statistically significant difference in experimental and control group of bio physiological parameters. In post test, SBP χ2=19.33 and FBS χ2=9.03had high significance, DBP χ2=9.78 and PPBS χ2=7.85 had low significance, which showed that the bio physiological parameters score reduced in experimental group.

The above table 6 shows the comparison of post test level of bio physiological parameters reduction scores between experimental and control group.

In post test, there is a statistically significant difference in experimental and control group of bio physiological parameters. In post test, LDL χ2=3.99 had low significance, which shows that the bio physiological parameters score is reduced in experimental group. It indicates the effectiveness of the intervention.

Table 6. Comparison of post test level of bio physiological parameters reduction scores between experimental and control group.

Bio physiological parameters		Post test				Chi square test
		Experiment (n=150)		Control (n=150)		
		n	%	n	%	
TC	Normal	95	63.3	89	59.3	χ^2=2.48 P>0.28(NS)
	Borderline risk	47	31.3	54	36. 0	
	High risk	5	3.3	5	3.3	
	Very high risk	3	2.0	2	1.3	
Triglyceride	Normal	67	44.67	51	34	χ^2=3.60 P>0.17(NS)
	Borderline risk	58	38.67	68	45.3	
	High risk	25	16.67	25	16.7	
	Very high risk	0	0	8	5.3	
LDL	Normal	100	66.7	86	57.3	χ^2=3.30 P>0.19(NS)
	Borderline risk	47	31.3	60	40.0	
	High risk	2	1.3	2	1.3	
	Very high risk	1	0.7	2	1.3	
VLDL	Normal	137	91.33	132	88.0	χ^2=5.19 P>0.08(NS)
	Borderline risk	10	6.67	7	4.7	
	High risk	4	2.00	6	4.0	
	Very high risk	2	1.33	5	3.3	
HDL	Normal	123	82.0	118	78.7	**χ^2=3.99 P<0.05*(S)**
	Borderline risk	21	14.0	17	11.3	
	High risk	2	1.3	13	8.7	
	Very high risk	4	2.7	2	1.3	

P>0.05 not significant *P<0.05 significant NS=not significant S=Significant

Table 7 Association of mean differed bio physiological parameters score with their selected demographic variables of adults in experimental group.

N = 120

Demographic variables		Bio physiological parameters Reduction score						N	Oneway ANOVA F-test/t-test
		Pretest		Posttest		Reduction score= pre-post			
		Mean	SD	Mean	SD	Mean	SD		
Age	20 -25 years	7.62	3.21	4.13	2.84	3.49	3.04	26	**F=3.09 P=0.05* (S)**
	26 -30 years	7.57	3.79	5.35	3.08	2.22	3.89	79	
	31 -35 years	8.51	3.22	7.15	2.12	1.36	2.94	45	
Gender	Male	8.07	2.98	6.45	2.29	1.62	2.86	43	**t=2.28 P=0.03* (S)**
	Female	7.78	3.74	4.81	2.97	2.97	3.68	107	
Work pattern	Sedentary	7.88	4.06	4.64	2.24	1.47	3.24	25	**F=3.20 P=0.04* (S)**
	Moderate	7.38	3.15	4.19	3.96	3.28	3.19	47	
	Heavy	8.14	3.59	4.81	2.03	2.07	3.33	78	
Marital status	Married	7.86	3.79	4.59	2.86	2.69	3.27	106	**F=3.44 P=0.03**(S)**
	Unmarried	7.76	3.58	4.41	3.04	1.29	3.35	21	
	Separated	0.00	0.00	0.00	0.00	.00	0.00	0	
	Widowed	7.96	2.10	6.65	1.79	1.22	1.31	23	
	Others	0.00	0.00	0.00	0.00	.00	0.00	0	
Monthly family income	< Rs.1589	0.00	0.00	0.00	0.00	.00	0.00	0	**F=2.42 P=0.03*(S)**

***P<0.05 significant ** P<0.01 high significant S=Significant**

The above table 7. shows the association of mean differed bio physiological parameters score with their selected demographic variables of adults in experimental group. The findings revealed that in experimental group significant statistical association was identified for all the variables such as age (F=3.08 at P=0.05), gender (t=2.18 at P=0.03), work pattern (F=3.10 at P=0.04), marital status (F=3.54 at P=0.03) and monthly family income (F=2.41 at P=0.03).

But, none of the bio physiological parameters in the control group have shown any statistical significance when analysed by using One way ANOVA F-test/t-test.

Table 8. Identification of influencing factors for bio-physiological parameters reduction score using univariate analysis with their selected demographic variables of adults in experimental group.
N=150

Demographic Variables		Bio physiological parameters Reduction score				TOTAL	Chi square test	Odds Ratio (95%CI)
		Below average (≤2.52)		Above average (>2.52)				
		n	%	n	%			
Age	>30 years	68	54.8	56	45.2	124	χ^2=6.69 P=0.01**	3.3 (1.3 -8.4)
	20 -30 years	7	26.9	19	73.1	26		
Gender	Male	28	65.1	15	34.9	43	χ^2=5.50 P=0.02*	2.4 (1.1 -4.9)
	Female	47	43.9	60	56.1	107		
Work pattern	Heavy	45	57.7	33	42.3	78	χ^2=3.85 P=0.05*	1.9 (1.0 -3.7)
	Sedentary/ moderate	30	41.7	42	58.3	72		
Marital status	Others	28	63.6	16	36.4	44	χ^2=4.63 P=0.03*	2.2 (1.1 -5.3)
	Married	47	44.3	59	55.7	106		
Monthly income	<Rs.11816	39	61.9	24	38.1	63	χ^2=6.15 P=0.01**	2.3 (1.2 -4.7)

***P<0.05 significant ** P<0.01 high significant S=Significant**

The above table 8 shows the identification of influencing factors for bio-physiological parameters reduction score using univariate analysis with their selected demographic variables of adults in experimental group. Univariate analysis identifies demographic variables such as age group more than 30 years, females, moderate work pattern, married adults and more monthly income adults had reduced more bio physiological parameters score than other variables.. Unadjusted odds ratio was given with 95% CI.

Table 9 Identification of influencing factors for bio-physiological parameters reduction score using multivariate logistic regression with their selected demographic variables of adults in experimental group.
N=150

Demographic Variables	Univariate analysis		Multivariate analysis	
	p-value	Unadjusted OR(95%CI)	p-value	Adjusted OR(95%CI)
Age (≤30 years Vs >30 years)	0.01**	3.3(1.3 -8.4)	0.02*	2.1(1.1– 64)
Sex(Female Vs Male)	0.02*	2.4(1.1 -4.9)	0.03*	1.9(1.0- 4.2)
Work pattern (Sedentary/moderate Vs Heavy)	0.05*	1.9(1.0 -3.7)	0.05*	1.7(1.0 -3.5)
Marital status (Married Vs Others)	0.03*	2.2(1.1 -5.3)	0.17	1.1(0.4- 2.0)
Monthly income (>Rs.11816 Vs < Rs.11816)	0.01**	2.3(1.2 -4.7)	0.04*	1.8(1.2- 4.4)

P>0.05 not significant *P<0.05 significant ** P<0.01 high significant S=Significant
NS=not significant S=Significant.

The above table 9 shows the identification of influencing factors for bio-physiological parameters reduction score using multivariate logistic regression with their selected demographic variables of adults in experimental group. Multivariate analysis logistic regression identifies the demographic variables such as age group more than 30 years, females, moderate work pattern and more monthly income adults had reduced more bio physiological parameters score than other variables. Adjusted odds ratio was given with 95% CI.

Regarding the comparison in the experimental and control group, the Extended McNemar's test revealed that there was no statistically significant difference in the mean of bio physiological parameters of CVDs risk with in experimental and control group in the pre test and also in post test very high level statistical significance was found p<0.001 at SBP (χ^2 =28.24), FBS (χ^2 =15.73), PPBS (χ^2=23.11) and LDL(χ^2=21.00) level proving the effectiveness of selected intervention package.

The Chi square value was SBP (χ^2=19.33), DBP(χ^2 =9.78), FBS(χ^2 =9.03), PPBS(χ^2 =7.85) and HDL(χ^2=3.99) which showed p<0.01 moderately statistical significance between in the experimental and control group in the post test but there

is no significant pre test. This shows that there was a statistical significance in the bio physiological parameters reduction score among adults in the experimental group.

The statistical analysis above proved that the selected intervention package had significant impact in reduction in bio physiological parameters among adults with modifiable risks of CVDs risk within and between the experimental group and control group at p<0.001 level. Thus the null hypothesis **NH_1 and NH_2** stated that "There is no significant difference and correlation in bio physiological parameters in reduction of modifiable risks of CVDs among young adults' was not accepted for the experimental group and accepted for the control group.

With regard to association between the pre and post test level of bio physiological reduction score and demographic variables in experimental group. There was statistically significant association found for the demographic variables such as age (F=3.08 at P<0.05), gender (t=2.18 at P<0.03), monthly family income (F=2.41 at P<0.03), work pattern (F=3.10 at P<0.04) and marital status (F=3.54 at P<0.03).

At the same time, no statistical significant association was established with mean differed pre test and post test level of bio physiological parameters reduction score with any of the selected demographic variables in control group.

Hence, the **NH_3** stated earlier that **"**To associate the pre and post test mean difference level of bio physiological parameters in reduction of modifiable risks of CVDs among adults with their selected demographic variables" was not accepted for age, gender, type of family, education, type of work pattern, marital status and family monthly income and accepted for the other demographic variables.

The evidence generated from the study revealed that for the experimental group the selected nursing intervention had significant impact in improving the knowledge at p<0.001 level.

CONCLUSION

The study concludes that selected nursing intervention is an effective intervention strategy in the reduction of modifiable risks of CVDs among adults living with cardiac risks. People living in urban community with cardiac risks can be prevented from many diseases and complications through the selected interventional package. It will also help the adults living with cardiac risks to lead healthy life style along with reduction of cardiac risks. The study shows an increased percentage of benefit score after having interventional package on bio physiological parameters of the experimental and control group. In experimental group reduction of bio physiological parameters in 25.79 percentage whereas in control group reduction of bio physiological parameters in 2.61 percentage. It shows the effectiveness of selected intervention package on reduction of modifiable risks of CVDs in experimental group. The family members those who are living among adults with cardiac risks can also prevent cardiac risks and disease by adhering the life style changes through selected interventional packages. The intervention also recommended the use of this structured intervention package by necessary to educate the people on CVDs and adhere to lifestyle changes in preventing complications.

RECOMMENDATIONS

1. A similar study can be conducted on a large sample size and in different settings.
2. A comparative study can be conducted among adolescent and adults at risk of CVD
3. A similar study can be done in rural areas.
4. A study to assess the effect of structured teaching programme regarding non pharmacological management of CVDs like diet and relaxation techniques can be done.
5. Similar study can be done without pharmacological management with adults with CVDs risk.
6. A study can be performed by developing a selected intervention package which enables the care givers to become aware of effectiveness of complementary and alternative therapies like exercise, relaxation technique and diet and its benefits.
7. A further study can be conducted to assess the knowledge, attitude and practice of complementary and alternative therapies like exercise, relaxation technique and diet.

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REFERENCES

1. NHS choices on cardio vascular diseases.2016.
2. https://www.nhs.uk/conditions/cardiovascular-diseases/
3. Rich MW, Chyun DA, Skolnick AH, Alexander KP, Forman DE, Kitzman DW.etal. Knowledge Gaps in Cardiovascular Care of the Older Adult Population: A Scientific Statement From the American Heart Association.Circulation. 2016May24;133(21):2103 22.doi: 10.1161/CIR.0000000000000380.

4. 4. K, Veerasekar G, Kuppusamy S, Sundaresan M, Velmurugan G, Palaniswami NG. Noncommunicable disease in rural India: Are we seriously underestimating the risk? The Nallampatti noncommunicable disease study.Indian J Endocrinol Metab. 2017 Jan-Feb; 21(1): 90–95. doi: 10.4103/2230-8210.196001
5. Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. Lancet. 1997;349:1498–504.
6. Olmas M .The CDC recommends the following steps to help prevent cardiovascular disease,Medicare.com.1-844-847-2660 TTYusers 711.https://medicare.com/health/what-are-the-risk-factors-for-cardiovascular-disease/
7. DorairajPrabhakaran .Global burden of cardiovascular diseases.Cardiovascular diseases in India.Current Epidemiology and Future Directions. CirculationAHA. April 18, 2016;133:1605-1620.
8. Kumar. Mortality rate due to heart diseases highest in T.N.THE HINDU NEWS.Cuddalore: march 06, 2013.
9. Jing Fang.Reporting of Adherence to Healthy Lifestyle Behaviors among Hypertensive Adults in the 50 States and the District of Columbia.J Am SocHypertens. 2016 Mar; 10(3): 252–262.
10. Mazloomy SS, Baghianimoghadam MH, Ehrampoush MH, Baghianimoghadam B, Mazidi M, Mozayan MR. A study of the knowledge, attitudes, and practices (KAP) of the women referred to health centers for cardiovascular disease (CVDs) and their risk factors. Health Care Women Int. 2014 Jan;35(1):50-9. doi: 10.1080/07399332.2012.755980. Epub 2013 May
11. Petrogianni M, Kanellakis S, Kallianioti K, Argyropoulou D, Pitsavos C, Manios Y. A multicomponent lifestyle intervention produces favourable changes in diet quality and cardiometabolic risk indices in hypercholesterolaemic adults. J Hum Nutr Diet. 2013 Dec;26(6):596-605. doi: 10.1111/jhn.12041. Epub 2013 Mar 20.
12. Cardiovascular Disease American heart association. Apr 13, 2018.
13. World health organization. The top 10 global health issues to world 2013.
14. Park K. Textbook of Preventive and Social Medicine Jabalpur: BanarsidasBhanot Publishers; 2008.
15. Polit F.D, Hungler PB. Nursing Research Principles and Methods. J.B Lippincott Company; 2011.