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RESEARCH ARTICLE

EFFECTIVENESS OF AN EDUCATIONAL INTERVENTION REGARDING KNOWLEDGE ON PREVENTION OF CORONARY ARTERY DISEASE AMONG STUDENTS.

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Abstract

Background and Objectives: Cardiovascular diseases account for a large proportion of all deaths and disability worldwide. Reductions in major risk factors probably accounted for approximately half the decrease in deaths from coronary heart disease. The overall objective of this study was to find out the effectiveness of an educational intervention regarding the knowledge on prevention of coronary artery diseases.

Method and Materials: One group pre-test, post test design was used. Data was collected by using semi structure self administered questionnaire. Proportionate stratified random sampling technique was used to select the desire samples (136). A pretested semi structured questionnaire was used to collect data before and after the intervention. Data was analyzed by using SPSS and various tests such as paired t-test and one way ANOVA.

Results: Out of 136 respondents**,** 40.4% were 21years of age, 56.5% were male, and 41.9% were from Education group. Before educational intervention, the total mean knowledge score on prevention of coronary artery disease was 43.47% whereas after educational intervention was 91.61%. Before educational intervention the highest mean knowledge score was 56.25% on quieting cigarette smoking whereas after educational intervention was95.75% on maintaining healthy weight. Before educational intervention the lowest mean knowledge score was 32% on non preventable risk factors whereas after educational intervention was 82% on control of high blood pressure.There was statistically significant difference between before and after educational intervention ($p < 0.001$).

Conclusion: Educational intervention was effective as it seems to be a powerful tool in raising the knowledge so such kinds of intervention programme must be conducted on a regular basis in different campuses.

Introduction:-

Coronary artery disease (CAD) is a leading cause of morbidity and mortality worldwide and was responsible for 7.2 million deaths. South Asians may have a genetic predisposition to CAD; however, environmental, nutritional, and lifestyle factors may also be responsible. South Asians have a much higher prevalence of metabolic syndrome, diabetes, insulin resistance, central obesity, dyslipidemias, increased thrombotic tendency, decreased levels of

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physical activity, and low birth weights ("foetal origins hypothesis"). In addition, the dietary indiscretions and sedentary lifestyle practiced by most South Asians puts them at a higher risk. [1]

Despite the medical treatments and the encouraging reductions in fatal heart attacks and strokes over the past two decades, there were still 976,700 deaths in the United States alone from cardiovascular diseases in 1987, or 45.9 percent of all deaths that year, according to the American Heart Association and deaths from atherosclerotic disease composed the major share. Heart attacks, the leading cause of death in America, killed 513,700 persons in 1987, and almost 60 percent died before they reached a hospital.[2] There is a strong positive correlation of increase in coronary heart disease in India with primordial risk factors of urbanisation, excessive fat intake, faulty diet, tobacco consumption, and sedentary lifestyle. Major coronary risk factors- high blood pressure, high cholesterol levels, low HDL cholesterol, insulin resistance and diabetes are also escalating in India and correlate strongly with the increase in coronary diseases. [3]

Cardiovascular disease is the most common cause of Nepalese adults' death among which coronary artery disease (CAD) is by far the most frequent pathology. It is estimated that about 5% of the adult population in the capital Kathmandu have severe CAD and the disease is increasing at an alarming rate.[4] Low-to-moderate intensity activities for as little as 30 minutes a day can be beneficial. Climbing stairs, gardening, yard work, moderate-to-heavy housework, dancing, and home exercise. However, more vigorous aerobic activities, done three or four times a week for 30 to 45 minutes, are best for improving the fitness of the heart and lungs. Regular, aerobic physical activity increases a person's capacity for exercise and plays a role in prevention of cardiovascular diseases. Aerobic exercise may also help to lower blood pressure pleasure walking. [5]

The World Health Organization has stated that, since 1990, more people worldwide have died from coronary heart disease (CHD) than any other cause. Further, they reported that 80% to 90% of people dying from CHD had one or more major risk factors associated with lifestyle (6). Exercise-only interventions resulted in a 27% reduction in total mortality and 31% reduction in cardiac mortality while comprehensive rehabilitation reduced mortality to a lesser extent (26%). [6]

Study done in Knowledge of Coronary Artery Disease (CAD) risk factors and Coronary Intervention among University Students showed that 25% of the students refused to quit smoking as a preventive measure for heart disease. This outlines the fact that tremendous efforts need to be made in forms of anti tobacco media coverage and prohibit this young generation from smoking. Cigarette smoking can result in at least two-fold increase in risk of CAD.Adult students graded smoking as the top most risk factor for coronary artery disease. In a multi centrecrossectional study conducted in four tertiary care hospitals, 31% patients' attendants identified smoking as a risk factor. It was however third on list as a risk factor after stress and dietary fat. Low and middle-income countries including the South Asian countries of India and Pakistan contribute significantly to the global burden of cardiovascular diseases accounting for 75% of all deaths and 86.3% of all loss of disability adjusted life years attributable to this cause. [7]

MaterialsAnd Methods:-

One group pre-test, post-test design was used to find out the effectiveness of educational intervention regarding the knowledge on prevention of coronary artery diseases. One group pre-test, post-test design enabled the investigator to determine the influences of the treatment variable on the dependent variable, scores on the pre-measured was compared with scores on the post measure. Bachelor level 3rd year students of different programme (Education, Microbiology, Business Administration, and Business Studies) of HariKhetan Multiple Campus, Birgunj were selected for the study. Then, total 136 samples were selected by using stratified random sampling technique from the sampling frame. Both male and female of bachelor 3rd year student were included. Those who were absent and not willing to participate were excluded from the study. Sample size was determined by using following formula:

$$\frac{z^2 pq}{d^2}$$

Where, z = corresponding to 95% confidence level which is 1.96, d is the degree of precision is 5% and confidence level is 95%

Probability of success p=0.5, Failure of probability q= 1-p=1-.5=.5

$$n = \frac{n_o}{1 + \frac{n_o}{N}}$$

The sample size was: 125
To reduce non response error additional 10% was taken so, 125+10% of 125 =138

Bachelor third year students:-

N=350

Education	150	138/350*150	59
Business Administration	100	138/350*100	39
Microbiology	50	138/350*50	20
Business Studies	50	138/350*50	20
Total			n=138

Educational intervention regarding knowledge on prevention of coronary artery disease had included dietary measure, cessation of smoking, physical activity, weight control, stress, controlling of hypertension and diabetes. Semi structured self administered questionnaire was developed from this educational intervention. This was prepared of about one hour. This education intervention was provided to the respondents and after one week same research instrument was used to collect the data from the same respondents. A pretested**S**elf Administered Questionnaire (SAQ) was developed by the researcher herself on the basis of educational intervention. Before the commencement of the study ethical approval from the Institutional Review Committee was taken from CMC-IRC. Written permission was taken from the authority of HariKhetan Multiple Campus. The written informed consent was obtained from each respondent. The information given by respondents was kept confidential. The respondents' dignity was maintained by giving right to reject or discontinue from the research study at any time. The respondents' privacy was maintained during data collection by maintaining anonymity by coding. During data collection respondents was divided into two groups, one group having 67 respondents and other group having 69 respondents. First group was given the education intervention for about 1 hour by using lecture method and the audiovisual aids (LCD and white board) then after one hour 2nd group was given same educational intervention by same teaching learning media and method for same duration. After one week again data was collected from both groups by the investigator herself by using the same questionnaire that was post-test.
All collected data were reviewed and checked daily for its completeness, consistency and accuracy. The collected data were coded and entered in SPSS version 20. Data was summarized using the descriptive statistics such as frequency, percentage, mean and standard deviation. Inferential statistics (paired t-test) was used to find out the effectiveness of educational intervention and association between effectiveness of educational intervention and selected variables.

Results:-

Table 1:-Socio-demographic Characteristics of Respondents

n=136

Variable	Frequency	Percent
Age group		
20 years	19	14.0
21 years	55	40.4
22 years	40	29.4
23 years	18	13.2
24 years	3	2.2
26 years	1	0.7
Sex		
Male	77	56.6
Female	59	43.4
Major Group		
Education	57	41.9
Microbiology	20	14.7

Business Administration	39	28.7
Business Studies	20	14.7
Ethnic group		
Brahmin/Chhetri	35	25.7
Janjati	33	24.3
Madhesi	47	34.6
Others	21	15.4
Religion		
Hindu	117	86.0
Muslim	19	14.0
Types of family		
Nuclear	83	61.0
Joint	53	39.0

Mean age ± SD= (21.52±1.04) yrs. Min=20yrs, Max=26yrs

Table 1 reveals that:The majority of the respondents 55 (40.4%) were 21 years and minority 1 (0.7%) was 26 years. The mean age of the respondents were 21.52 years with 1.04 years standard deviation. There were 77 (56.6%) male and only 59 (43.4%) female. Majority of the respondents 57(41.9%) were from Education, 39(28.7%) were from Business Administration, 20(14.7%) were from Microbiology and 20 (14.7%) were from Business Studies. Majority of the respondents 47 (34.6%) were Madhesi and minority 21 (15.4%) were others (Muslim and not known). Regarding the religion of the respondents, the majority of the respondents 117 (86%) were Hindu and minority 19 (14%) were Muslim. Regarding the types of family of the respondents, the majority of the respondents 83 (61%) were from nuclear family and minority 53 (39%) were from joint family.

Table 2:-Respondents' Knowledge Score Regarding Prevention on Coronary Artery Disease Before and After Educational Intervention

n=136

Variables	**Before educational intervention**		**After educational intervention**		**Maximum Possible Score**	**p -value**
	Mean Score ± SD	**Percent of Mean Score**	**Mean Score ± SD**	**Percent of Mean Score**		
Non preventable risk factors	1.67±.99	32	4.64± .55	92.8	5	0.000
Different types of diet to be taken	8.18± 3.19	45.5	16.15±1.68	89.72	18	0.000
Food containing high Cholesterol	1.79 ±1.22	35.8	4.58±0.88	91.6	5	0.000
Food containing high Salt	2.05± 1.24	34.16	5.36±0.96	89.33	6	0.000
Quieting Cigarette smoking	2.25± 0.73	56.25	3.71±0.54	92.75	4	0.000
Control of high blood pressure	4.54± 1.76	50.44	7.38±1.16	82	9	0.000
Exercise	2.52 ±1.12	36	6.51±0.70	93	7	0.000
Control of diabetes	1.89± 1.07	37.8	4.63±0.87	92.6	5	0.000
Maintaining healthy weight	2.20 ±0.94	55	3.83±0.41	95.75	4	0.000
Managing stress	2.43± 1.39	48.6	4.66±0.77	93.2	5	0.000
Total	**29.56± 7.68**	**43.47**	**62.3± 3.52**	**91.61**	**68**	**0.000**

Significant level is 0.05 **paired t test is computed for p-value**

The table 2 reveals the comparison between the mean knowledge score of the respondents' on knowledge on prevention of coronary artery disease before and after educational intervention. The difference between mean knowledge score on prevention of coronary artery disease before educational intervention and after educational

intervention of each Variable was calculated by paired't' test. The p value was 0.000 of each variable and there was statistically significant difference at 5% level of significance (P< 0.05).

Table 3:-Comparison of Level of Knowledge on Prevention of Coronary Artery Disease Before and After Educational Intervention

n=136

Types of intervention	Level of knowledge		
	Poor	Fair	Good
Before Educational intervention	78(57.4%)	56(41.2%)	2(1.5%)
After Educational intervention	0	1(0.7%)	135(99.3%)

Table 3 reveals the comparison which shows that, before educational intervention the majority of the respondents 78 (57.4%) had poor knowledge where as minority 2 (1.5%) had good knowledge. After educational intervention majority of the respondents 135 (99.3%) had good knowledge where as 1 (0.7%) had fair knowledge.

Table 4:-Comparison of Mean and Standard Deviation Knowledge Score Before and After Educational Intervention

n=136

Types of intervention	Mean Score	Standard Deviation	p-value
Before educational intervention	29.56	7.68	.000
After educational intervention	62.38	3.52	

Significant level is 0.05 paired t test is computed for p-value

Table 4 reveals that, before and after educational intervention, the total mean score and standard deviation were 29.56 ±7.68 and 62.38 ±3.52 respectively. The effectiveness of educational intervention programme was tested by paired t-test. The p- value was 0.000. There was statistically significant difference between before and after educational intervention.

Table 5:-Percentage of Mean Knowledge Score Changes Before and After Educational Intervention

n=136

Before educational intervention	After educational intervention	Score changes before and after educational intervention
43.47	91.73	48.26

Table 5 reveals that, the percentage of mean knowledge score before educational intervention was 43.47, after education intervention was 91.73 and changed mean score before and after educational intervention was 48.26.

Table 6:-Comparison of Mean and Standard Deviation Knowledge Scores among Major Groups Before and After Educational Intervention

n=136

Major groups	Before educational intervention		After educational intervention		p-value
	Mean Score	Standard Deviation	Mean Score	Standard Deviation	
Microbiology	31.4	6.82	61.7	5.39	.000
Education	29.82	8.58	62.57	2.97	.000
Business Administration	28.76	6.52	62.12	3.47	.000
Business Studies	28.55	8.02	63.05	2.81	.000

Significant level is 0.05 paired t test is computed for p-value

Table 6 reveals that, before and after educational intervention, the effectiveness of educational intervention programme was tested by paired t-test. The p value was 0.000 of each major group and there was statistically significant difference at 5% level of significance of each group before and after educational intervention.

Table 7:-Mean Knowledge Score Changes Before and After Educational Intervention in the Four Major Groups

n=136

Major Group	Before educational	After educational intervention	Score changes before and after educational intervention

	intervention		
Microbiology	31.4	61.7	30.3
Education	29.82	62.57	32.75
Business Administration	28.76	62.12	33.36
Business Studies	28.55	63.05	34.5
ANOVA, P- value	0.583	0.610	0.402

Significant level is 0.05

Table 7 reveals that, from the one way ANOVA test, before the educational intervention the p value was 0.583, after the educational intervention the p value was 0.610 and the p value of score changed was 0.402 at 5% level of significance. That is there was no statistically significant of mean knowledge score among the major groups before and after educational intervention. It concludes that before educational intervention there was no different in knowledge among four major groups and after educational intervention also the knowledge different among four major groups was not found.

Discussion:-

This study attempted to find the effectiveness of an educational intervention regarding knowledge on prevention of coronary artery disease among students. Regarding the demographic characteristics, this study revealed that the mean age of students was 21.52±1.04. The male respondents were (56.6%) and female respondents were (43.4%) which is similar to one of the study where mean age of the students were 20 yrs ± 2.2 and male students were 38% and female 62%. [7]The findings of this study showed that after the educational intervention, almost all of the respondents 99.3% had good knowledge, 0.7% had fair knowledge and no onehad poor knowledge but one the of the study revealed contradictory finding with 32% excellent knowledge, 40% as very good, 24% as good, 4% as fair, and <1% as poor knowledge.[8]

The mean knowledge score on risk factors of coronary artery disease, before educational intervention was 32% and after educational intervention was 92.8% ($p < 0.001$). One of the study revealed similar findings, out of 34 points before educational intervention, the mean score was 25.7 and after educational intervention, the mean knowledge score was 30.3 and ($p < 0.001$).[9] Satisfaction data demonstrated that 22 participants (73.3%) earned cardiovascular risk factors of which they were previously unaware. The mean knowledge score of cigarette smoking, before educational intervention was 56.25% and after educational intervention was 92.75% ($p < 0.001$). One of the study revealed similar findings that before educational intervention percentage of knowledge on smoking was 7.3%, after educational intervention was 35.8% ($p < 0.001$) and knowledge about quitting of smoking pre-test mean was 5.78 and post-test mean was 5.93 ($p < 0.005$).[9]

The mean knowledge score of diet to be taken before intervention was 45.5% and after intervention was 89.72% ($p < 0.001$) and the mean knowledge score on exercise before intervention was 36% and after intervention was 93% ($p < 0.001$). One of the research studies have supported the finding, the mean knowledge score of diet to be taken before and after educational intervention was 15.4% and 40.5% respectively ($p < 0.001$), the mean knowledge score on exercise before educational intervention was 87.1% and after educational intervention was 96.2% ($p < 0.001$).[10]

In this study, the mean knowledge score of food containing high cholesterol, before educational intervention was 35.8%, after educational intervention was 91.6%, ($p < 0.001$) and the mean knowledge score of control of blood pressure before educational intervention was 50.44 %, after educational intervention was 82% ($p < 0.001$). The finding is supported by similar results.[11] In this study, the total knowledge score on prevention of coronary artery disease, there was statistically significant difference between before and after educational intervention ($p < 0.001$). The findings of this study was supported by few studies ($p < 0.001$ & ($p = 0.002$ respectively).[11,12]After educational intervention there is increase in few or more knowledge. But concerning the types of exercise to be performed before and after educational intervention the knowledge of percentage remain same. It may be due to misinterpretation of the questions alternative option because respondents might have felt that different types of exercise are given on television and one can perform by watching.

Conclusion:-

The conclusions made are based on the findings of the study. Regarding the knowledge on prevention of coronary artery disease, mean knowledge score before educational intervention was 43.47% and after education intervention was 91.73%. Therefore this study reveals that an educational intervention is an effective measure to prevent from the coronary artery disease and can be conducted in mass population in most of the developing countries like Nepal. So, the study concludes that such type of educational intervention is found to be powerful tool and plays an important role in increasing the knowledge on prevention of coronary artery disease in students. The study was conducted only at one campus. The finding of the study may help the health policy makers and health planners andcurriculum planners for designing the programme related to the prevention of coronary artery disease.Intervention programme must be conducted on a regular basis in different colleges toincrease the knowledge on prevention of coronary artery disease.This study can be replicated in a large sample and in different setting to increase theknowledge on prevention of coronary artery disease.

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