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Effect of educational intervention on knowledge regarding risk factors and early symptoms of coronary artery diseases among school teachers of selected higher secondary school in rural Community, Bankura, West Bengal

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Abstract
A pre experimental study was conducted on effect of educational intervention on knowledge regarding risk factors and early symptoms of coronary artery diseases among school teachers of selected higher secondary school in rural community, Bankura, West Bengal with the objectives to assess the knowledge regarding risk factors and early symptoms of coronary artery diseases before and after educational intervention, to evaluate the effectiveness of educational intervention by the difference in scores obtained in pre-test and post-test and to find out the association between pre-test knowledge score and selected demographic variables. 84 teachers from 3 higher secondary schools of Bankura were selected by non-probability consecutive sampling technique. One group pre-test post-test design was adopted. The semi structured demographic proforma and structured knowledge questionnaire were used for collection of demographic data and knowledge of the samples respectively. The Study findings revealed that the mean post-test knowledge score (26.08±2.16) was apparently higher than the mean pre-test knowledge score (14.51±2.23) with a mean difference of 11.57. The educational intervention was effective on increasing knowledge as evident from the mean difference of pre and post-test knowledge score ('T'=34.52, p<0.05). There was no association between pre-test knowledge score and selected demographic variables. The scope of generalisation of findings were limited to present study population. So the study can be replicated with large sample for wider generalization. The study has implication for nursing practice, education, administration and research.

Keywords: Educational intervention, coronary artery diseases, school teachers, knowledge

Introduction
About 60% of all fatalities are caused by common noncommunicable illnesses such diabetes, chronic respiratory diseases, cancer, and various types of cardiovascular diseases. The main cause of death, which is responsible for 17.7 million fatalities, is cardiovascular disease (CVD), which includes ischemic heart disease and cerebrovascular accidents like stroke [1]. According to a WHO report from April 7, 2022, 17.9 million people worldwide die from cardiovascular diseases (CVDs), the main cause of death. Registrar General of India and the Indian Council of Medical Research conducted a study revealed India accounts for approximately 60 per cent of the world's heart disease burden [2].

Atherosclerotic plaque in the coronary arteries causes the coronary arteries to narrow or become blocked, which reduces the blood and oxygen supply to the heart muscle. Coronary artery disease includes a range of clinical issues brought on by insufficient myocardial oxygenation. The heart needs a sufficient amount of blood flow to operate effectively. Two coronary arteries provide blood to the myocardium. Ischemia and heart muscle infarction are unavoidable if one or both of these arteries are obstructed for any cause, or if collateral circulation does not form. Atherosclerosis, angina pectoris, coronary insufficiency, and myocardial infarction are the main disorders brought on by inadequate blood flow to the myocardium; these conditions are collectively referred to as coronary heart disease (CHD), coronary artery disease (CAD), or ischemic heart disease (IHD) [3].

Adolescence, the transitional period between childhood and adulthood, is a very delicate time for life's growth and development. The main objectives of preventive cardiology are to identify these risk factors for coronary artery disease in childhood and adolescence and to create therapies to reduce them in order to avoid the development of CAD in adulthood. There has been a lot of evidence developed over the past 50 years to support the idea that atherosclerosis can start developing early and grow to an advanced level in adolescence [4].

Sedentary habit, stress, obesity, tobacco smoking, elevated serum cholesterol, hypertension diabetes all are risk factor of CHD. Important symptoms of CHD are chest pain (not relieved by rest, position changed), high blood pressure elevated cholesterol level, anorexia nausea, vomiting, sweating, shortness of breath etc. After gaining knowledge about these risk factors and symptoms individual may conscious about CHD and take precaution to prevent it [5].

An attempt is made by the researcher to design a planned educational intervention on risk factors and early symptoms of coronary artery diseases among higher secondary school teachers in rural community, which will be useful and informative to the Students and both of their family members on CAD and its prevention, which helps them to internalise their risk status and thereby motivated to bring about the desired modification in their lifestyle.

Background of the study

One of the leading cause of death in the world is coronary artery disease (CAD).

CAD is characterised by the accumulation of plaque within the layers of the coronary arteries. The plaques progressively enlarge, thicken and calcify, causing a critical narrowing (greater than 70% occlusion)of the coronary artery lumen, resulting in decrease in coronary blood flow and an inadequate supply of oxygen to the heart muscle [9].

Acute coronary syndrome (ACS) is an umbrella term to describe many associated complication of CAD. These include unstable angina, non-ST-elevation myocardial infraction (NSTEMI), and ST-elevation myocardial infarction (STEMI) [9].

Risk factors for coronary artery disease include: (a) Non-modifiable risk factors for the development of CAD include: age (risk rises with age), male sex (women usually experience heart disease 10 years later than men due to the postmenopausal decrease in cardiac protective oestrogen), race (non-white populations have increased risk), and family history. (b) Modifiable: High blood pressure, obesity, smoking, metabolic syndrome (obesity, hypertension, and diabetes mellitus), sedentary lifestyle, and stress. (c) Recent research has revealed additional risk factors for the emergence of CAD (d) The American Heart Association (AHA) also lists left ventricular hypertrophy (LVH) as a risk factor [9].

An atherosclerotic cardiovascular disease (ASCVD) risk assessment every 4 to 6 years is promoted for short-term and long-term prediction of the development of cardiovascular disease based on age, sex, race, results from a lipid profile, systolic blood pressure, usage of blood pressure medication, status with regard to smoking, and diabetes. Additional risk markers are diastolic blood pressure, chronic kidney disease, body mass index (BMI), and family history [9].

By addressing behavioural risk factors like tobacco use, unhealthy eating and obesity, inactivity and problematic alcohol consumption, the majority of cardiovascular illnesses can be avoided. Early detection of cardiovascular disease is crucial in order to start treatment with counselling and medication. WHO Report, 11-Jun-2021) [1].

Due to different metabolic, social, and cultural maladjustments, poor individuals in affluent nations and rich people in poor countries both suffer from CAD to a greater extent. Other contributing factors could be urbanization-related quick lifestyle changes and dietary changes brought on by such economic advancements. Less than 10% of the population under investigation engaged in regular physical activity, according to a study by the Indian Council of Medical Research-India Diabetes (ICMR-INDIA) [6].

Emerging risk factors: High homocysteine levels, ambient air pollution, temperature fluctuations, psychosocial factors, mental health, and higher high sensitivity C-reactive protein (hsCRP) levels indicating chronic infection and inflammation are also thought to be associated with a high prevalence of CAD [6].

Therefore, it is important to promote student and teacher knowledge of these risk factors.

Need of the study

The need for the study is that atherosclerotic alterations progress significantly during adolescence, starting in the early years. Today's teenagers are more susceptible to coronary artery disease due to physical inactivity, poor habits, eating fast food, unhealthy competition, and stress. In its study, the WHO suggested that by identifying risk factors in teenagers, schools could teach students about coronary artery disease risk factors and incorporate early lifestyle modification into the curriculum. Early on, the necessary lifestyle change can be implemented. Coronary artery disease is linked to a person's habit and lifestyle. Any effort to promote a healthy lifestyle among the populace can lower the morbidity and mortality rates associated with coronary artery disease [7].

On World Heart Day in 2022, the WHO will state that there have been more than 25,000 heart attack-related deaths in India over the previous four years and more than 28,000 over the previous three [8].

De Sima, Roy Rama Bishnu, and Kundu Kabita (2020) did a study in a particular adolescent clinic in Kolkata, West Bengal, to identify the risk factors of coronary artery disease in adolescents. The study's goal was to determine the causes of coronary artery disease in young people and how those causes interact with other factors. Measurements of body weight, blood pressure, and BMI were made, and the results were analysed using both descriptive and inferential statistics. 72% of teenagers had a moderate risk and 16% had a higher risk of developing coronary artery disease. 57% of teenagers reported a history of hypertension or coronary artery disease in their families [4].

Majumder Suprabha (2019) did a study to assess the effectiveness of a planned training program on risk factors and symptoms of coronary heart disease among school teachers of selected higher secondary schools in a rural community in Nadia district of West Bengal. The study's goals were to assess school teachers' knowledge of coronary heart disease risk factors and symptoms before and after PTP administration and to assess the program's performance in terms of knowledge gain score. The study's findings indicated that the pre-test knowledge score of school teachers was average (26.66%) and that their post-test knowledge score was good (34.48%), the pre-test and post-test SDs were 5.369 and 2.619, respectively; the mean difference between the two scores was 8.03. The knowledge score after the test was significantly different from the pre-

test level of [9].

Pattnayak Ujjwal, Banerjee Debdutta, Madhwani P. Kishore, and Singh Kumar Jitendra (2019) conducted a cross-sectional community survey to estimate the prevalence of risk factors for coronary artery disease in 418 people a rural community in Howrah, West Bengal. The objective was to calculate the prevalence rates of the main CAD risk factors and pinpoint the high-risk populations in the rural area. The study's findings showed that the most important risk factor was the prevalence of tobacco use (42. 3%) in the studied population. Other coronary risk factors were present in between 10% and 20% of people. Males were substantially more likely to use tobacco products, drink alcohol, and lead sedentary lifestyles. Conversely, females are more likely to have truncal obesity and systolic hypertension. 9.3% of participants tested positive for the DM family. All other coronary risk factors, such as a sedentary lifestyle, alcohol use, a BMI greater than or equal to 25, socioeconomic class, truncal obesity, and systolic and diastolic hypertension, were present in 10-20% of people. Males were substantially more likely than females to engage in coronary risk factors such smoking, leading a sedentary lifestyle, and drinking alcohol (p 0.001) [10].

Though Coronary artery diseases may be reduced by controling the modifiable risk factors, and early identification of signs and symptoms may lower the mortality and morbidity rate. Teachers are the important pillar of the society. There was limited study on the school teacher related to assessment of knowledge regarding coronary artery disease. Very few study had been conducted in West Bengal regarding risk factors and early symptoms of coronary artery disease among higher secondary school teachers. So, the researcher felt need to aware the secondary school teachers regarding risk factors and early symptoms of coronary artery diseases by educational intervention.

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Problem Statement
Effect of educational intervention on knowledge regarding risk factors and early symptoms of coronary artery diseases among school teachers of a selected higher secondary school in rural community, Bankura, West Bengal.

Purpose of the study
- To prepare an educational intervention program on risk factors and early symptoms of coronary artery diseases, which will help to improve the knowledge of the higher secondary school teachers in rural community.
- To identify the risk factors and early symptoms of coronary artery diseases, to take care of their family members with the coronary artery diseases, and prevent further progression of the diseases.

Objective of the study
- To assess the knowledge regarding risk factors and

early symptoms of coronary artery diseases before and after educational intervention.
- To evaluate the effectiveness of educational intervention by the difference in scores obtained in pre-test and post-test.
- To find out the association between pre-test knowledge score and selected demographic variables.

Assumptions
- School teachers may have some knowledge regarding coronary artery diseases.
- Teaching increases the knowledge.

Delimitation
The study will be delimited to only three higher secondary schools in rural community of Bankura District, West Bengal.

Conceptual Frame work
This study is based on and derived from general system theory as postulated by Ludwig Von Bertalanffy since 1968. According to general system theory, a system is a set of units interacting with each other within a boundary that filters the kind and rate of flow of inputs and outputs to and from the system. There are four basic elements to the systems model, i.e., input, process, output and feedback.

Input
It refers to the target group, demographic data and general information.

Process
It refers to different activities and manipulation that facilitate to acquire knowledge

Output
It is the end product of this system. It is the change of knowledge after the administration of educational intervention. The change of knowledge score can be measured by conducting posttest.

American Heart Association (AHA) estimates 1.2 million people will have coronary artery disease annually and about $1/4^{th}$ of these Will an emergency department of before reaching the hospital. Although mortality rate of coronary artery disease increased by 26.3% between 2008 and 2016, due to cardio vascular disease [4].

World Health Organization (WHO) estimates that there will be About 20 million death in 2015, and coronary artery disease recently where commonly in high income countries are how become dominant source of morbidity and mortality worldwide [5].

World Health Statistics has reported the prevalence of major Coronary artery disease risk factors in India, 32% adult death in 2010 to 2013.

Feedback
Feedback is necessary for judging adequacy of knowledge and modification of input, output and process phase.

Materials and Methods
The research methodology indicates the general pattern for organizing the procedure of gathering valid and reliable data for an investigation. It includes the strategies to be used to collect and analyze the data to accomplish the research objectives and to test the research hypotheses.
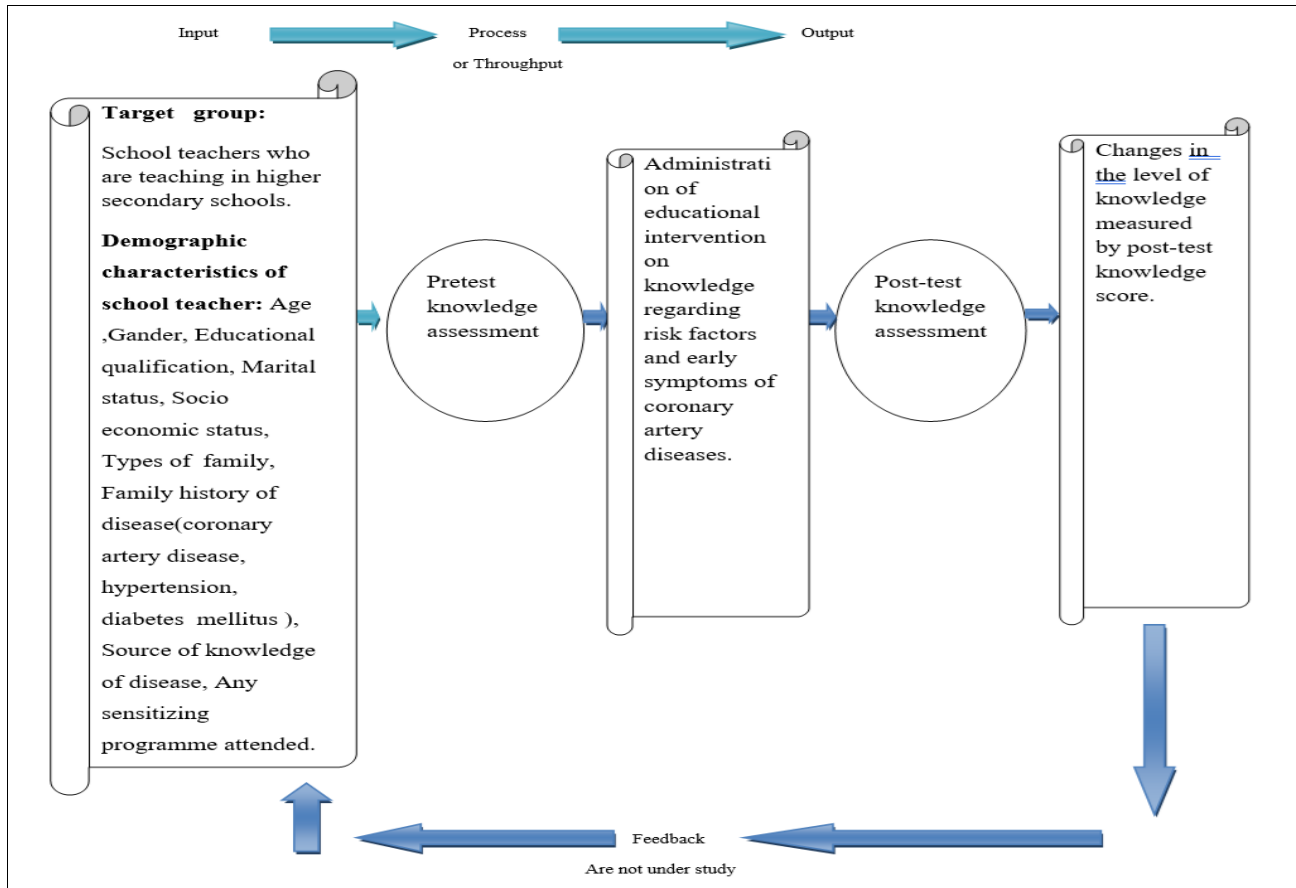
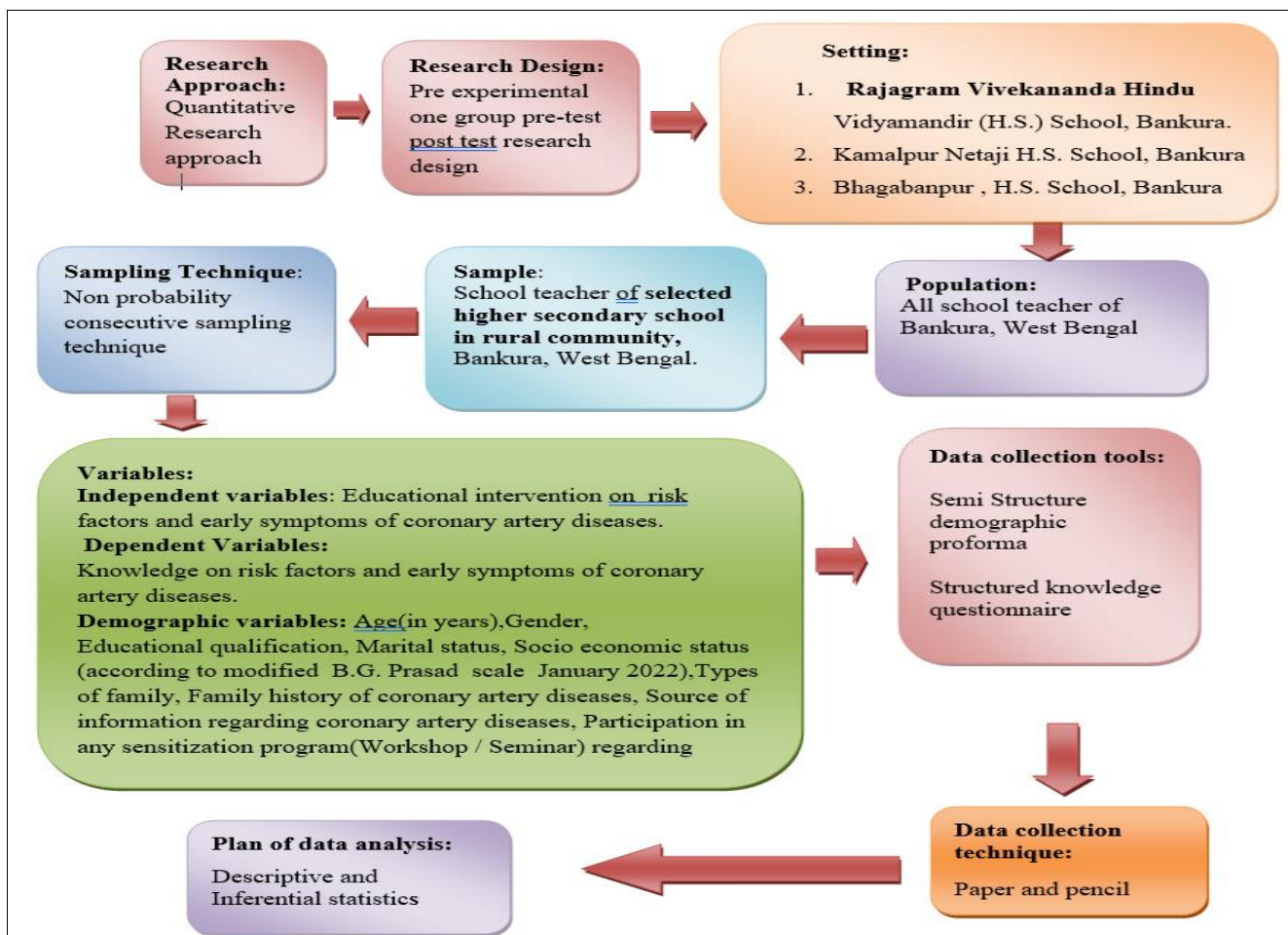**Fig 1:** Conceptual framework based On Karl Ludwig von Bertalanffy general system theory (1968)

Fig 2: Schematic representation of the study methodology

Research Methodology
Research Approach: A quantitative research approach.
Research Design: Pre experimental one group pre-test post-test research design.
Pre experimental one group pretest post test research design.

$$K_1 \rule{3cm}{0.4pt} X \rule{3cm}{0.4pt} K_2$$

(Pretest)   (Intervention)   (Posttest)
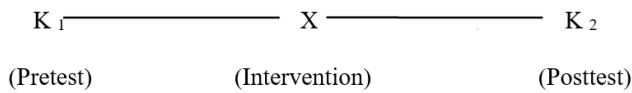
Fig 3: Schematic representation of research design

K$_1$-Assessment of pre-test knowledge regarding coronary artery disease.
X-Educational intervention on coronary artery disease.
X$_2$-Assessment of post-test knowledge regarding coronary artery disease.

Variables under study
Independent Variable Educational Intervention on risk factors and early symptoms of coronary artery diseases.
Dependent Variable: Knowledge score regarding risk factors and early symptoms of coronary artery diseases.

Demographic variables
- Age (in years),
- Gender,
- Educational Status,
- Marital status,
- Socioeconomic Status (B.G. Prasad scale 2022),
- Type of family Family history of coronary artery diseases,
- Source of information regarding coronary artery disease,
- Participation in any sensitization program (workshop/seminar etc.) regarding coronary artery diseases.

Setting of the Study
Pilot study
Khairullachak Netaji Bidyamandir (H.S.), Sadar West (rural community), Paschim Medinipur district, West Bengal.

Final Study
1. Rajagram Vivekananda Hindu Vidyamandir (H.S.) School Shyamdanga, Rajagram, Sadar West (rural community), Bankura district, West Bengal.
2. Kamalpur Netaji H.S. School, Bankura District, West Bengal.
3. Bhagabanpur, H.S. School, Bankura District, West Bengal.

Study Population
All school teacher of higher secondary school of the rural community, West Bengal.

Study Sample
The sample of Final Study was the higher secondary school teachers who met the inclusion and exclusion criteria, of →
1. Rajagram Vivekananda Hindu Vidyamandir (H.S.) School Shyamdanga, Rajagram, Sadar west (Rural community), Bankura district, West Bengal.
2. Kamalpur Netaji H.S. School, Bankura District, West Bengal.
3. Bhagabanpur, H.S. School, Bankura District, West Bengal.

Sample size of the Final Study: 84
[$N = Z^2 pq/l^2$ Where Z=Standard normal deviation at a desired confidence (95%) i.e., 1.96, previous prevalence= p =26.66% =.266=.27, allowable error=l=(.1) Majumder Suprabha (2019), CI, College of Nursing NRS Medical College, Kolkata, India has conducted "A study to evaluate the effectiveness of a planned teaching programme on risk factors and symptoms of Coronary Heart Disease among school teachers of selected higher secondary school at rural area in Nadia district, West Bengal].

Z= 1.96, p= 0.27, q = (1-p) = (1-.27), l = (.1)
$N = Z^2 pq/l^2$ = (1.96) x (1.96) x (.27) x (1-.27) / (.1) x (.1) = 0. 7571 / 0.01
=75.71 = 76 (approximate)

So, my sample size will be approximately 10% of sample size = 76 x10% =7.6
So, total sample size =76 + 8= 84

Sampling technique Non probability consecutive sampling technique who met the inclusion and exclusion criteria.

Sample criteria
Inclusion criteria
Both male and female teacher of higher secondary school
Participant willing to participate and available on 1st day and 7th day of study program.

Exclusion criteria
Acute physical illness.
School teacher having diagnosed coronary artery disease.

Sampling frame /Sampling process
- List of Rural Higher Secondary School was collected from DI office, Paschim Medinipur.
- Khairullachak Netaji Bidyamandir (H.S) was selected by purposive sampling technique among the Sadar Rural Higher Secondary Schools of Paschim Medinipur District.
- Total 84 samples of school teachers were selected from the school by consecutive sampling technique.

Table 1 Data collection tools and techniques

Table 1: This was based on the objectives of the study, The following data collection tools were developed in order to obtain necessary information.

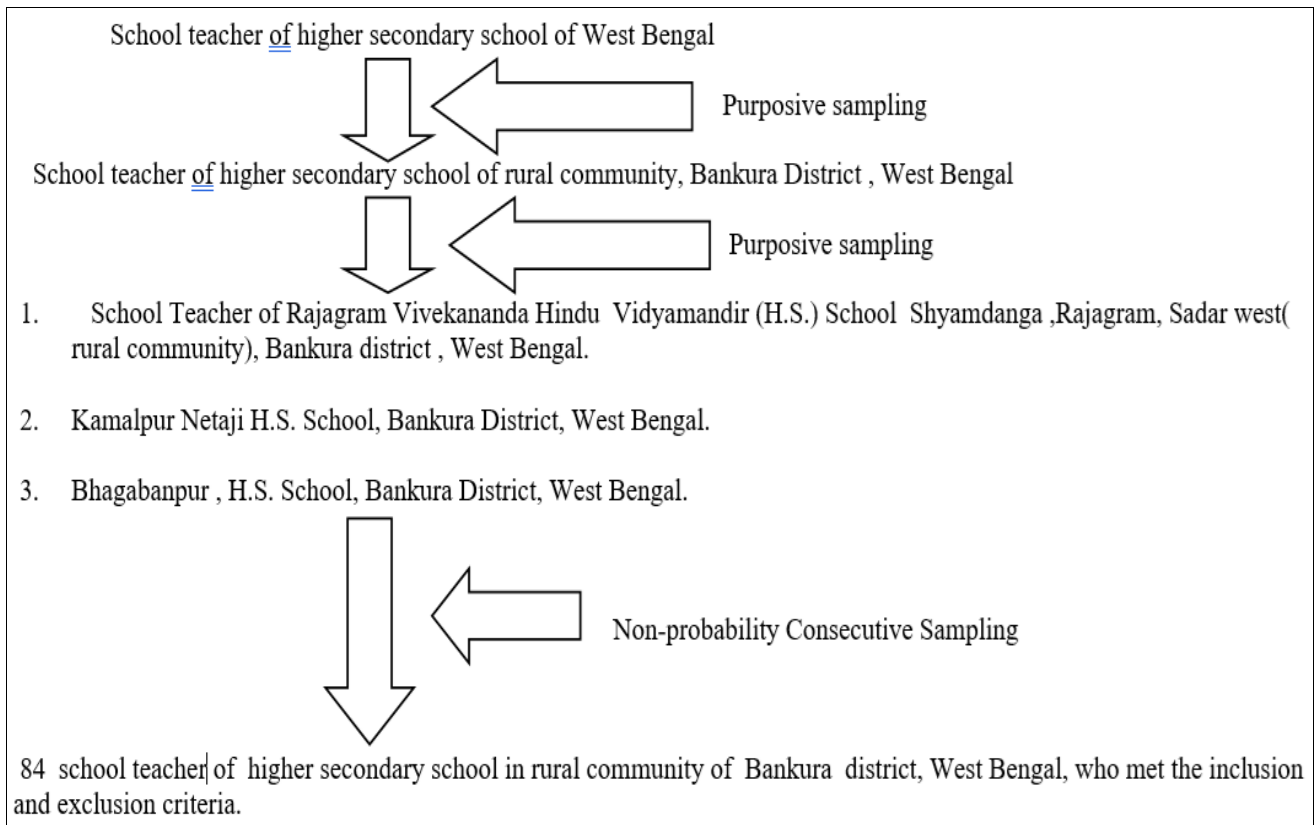| Tool No	Variables	Tools	Techniques
1.	Demographic variables	Semi-structured Demographic Proforma.	Paper and Pencil method.
2.	Dependent variables. Knowledge score of risk factors and early symptoms of coronary artery diseases.	Structured knowledge questionnaire.	Paper and Pencil method.

Fig 4: Diagrammatic representation of sampling technique.

Validity of the tools

The prepared tool and criteria check list was given to 9 experts for establishing the validity of the tool. The experts were asked to consider regarding addition, omission, suggestion to improve clarity of items.

Content validity index has been calculated for each item.

Tool-1: In demographic variable, there was 0.99% agreement on 9 questions.

Tool-II: In structured knowledge questionnaire to assess knowledge regarding risk factors and early symptoms of coronary artery diseases.

30 questions had 0.95% agreement. Only one item was omitted and one item was added and also 4 questions were modified because of partial agreement.

Table 2: Content Validity of Tool

Name of the Tool	Modified Item	Item omitted	Item added	Content validity index	Final item
Tool-I					
Semi structure Demographic Proforma	0	0	0	0.99	9
Tool-II					
Structured knowledge questionnaire	4, 12, 14, 16, 20	1(7)	1	0.95	30

Item analysis was done to find out the difficulty index and discrimination index. One question was found too easy and one question was found too difficult. So these two items were omitted from the items.

Table 3: Item analysis

Name of the Tool	Modified item	Item omitted	Final item
Tool II			
Structured knowledge questionnaire	0	2 (16,25)	30

Reliability of the tools

The reliability was obtained by calculating internal consistency using split-half technique on 20 subjects. The result was found to have $r = 0.80$ indicating that tool had highly acceptable level of reliability.

Table 4: Reliability of tools by the split half method

Name of the tool	Method of reliability testing	"R" Value
Tool II Structured knowledge questionnaire	Split Half formula	0.80

Table 5: Mean, median and standard deviation of knowledge score of the study sample about risk factors and early symptoms of coronary artery diseases, N=84

Knowledge score	Range of possible score	Range of obtained score	Mean	Median	S. D
Pre-test	0-30	10-19	14.74	14	1.91
Post-test	0-30	24-28	26.96	27	1.10

The data presented in the table 5 showed that the mean post-test knowledge score 26.96 was higher than the mean pre-test knowledge score (14.74) with the mean difference of 12.22

Table 6: Area wise Maximum possible score, mean, mean percentage and distribution of knowledge score of study sample. n= 84

Area of knowledge	Maximum Possible score	Pre-test		Post-test		Mean-Gain%		Modified gain
		Mean score	Mean% score	Mean score	Mean% score	Actual gain	Possible gain	
Meaning and Concept	6	3.65	61	5. 84	97	36	39	0. 92
Risk factors and causes	10	4.53	45	8. 7	88	43	55	0. 78
Diagnosis, Signs and symptoms	2	0.88	44	1. 65	83	39	56	0. 69
Prevention	12	5.8	48	10. 7	89	41	52	0. 78

The data in table 6 showed that knowledge was gained in pre-test and post-test in different areas regarding coronary artery diseases and its prevention. The data also depicted that the post mean percentage is higher compared to pre-test mean percentage knowledge score in all areas of awareness programme. So it concluded that awareness programme was effective in all areas in terms of knowledge of school teacher.

Table 7: Class interval wise distribution of knowledge, Frequency (pre-test) Frequency (post-test), N= 84

Class Interval	Knowledge: Frequency (pre-test)	Frequency (post-test)
10-12	8	0
12-14	37	0
14-16	21	0
16-18	16	0
18-20	2	0
20-22	0	0
22-24	0	5
24-26	0	17
26-28	0	62
28-30	0	0

Maximum possible score is 30 Minimum score is 0

Data presented in Table 7 showed that most modified gain score (0.92%) took place in the area of meaning and concept. majority modified gain score (0.69%) was in the area of diagnosis and signs and symptoms.

In each domain the mean percentage of post-test knowledge score was higher than the mean percentage of pre-test knowledge score.
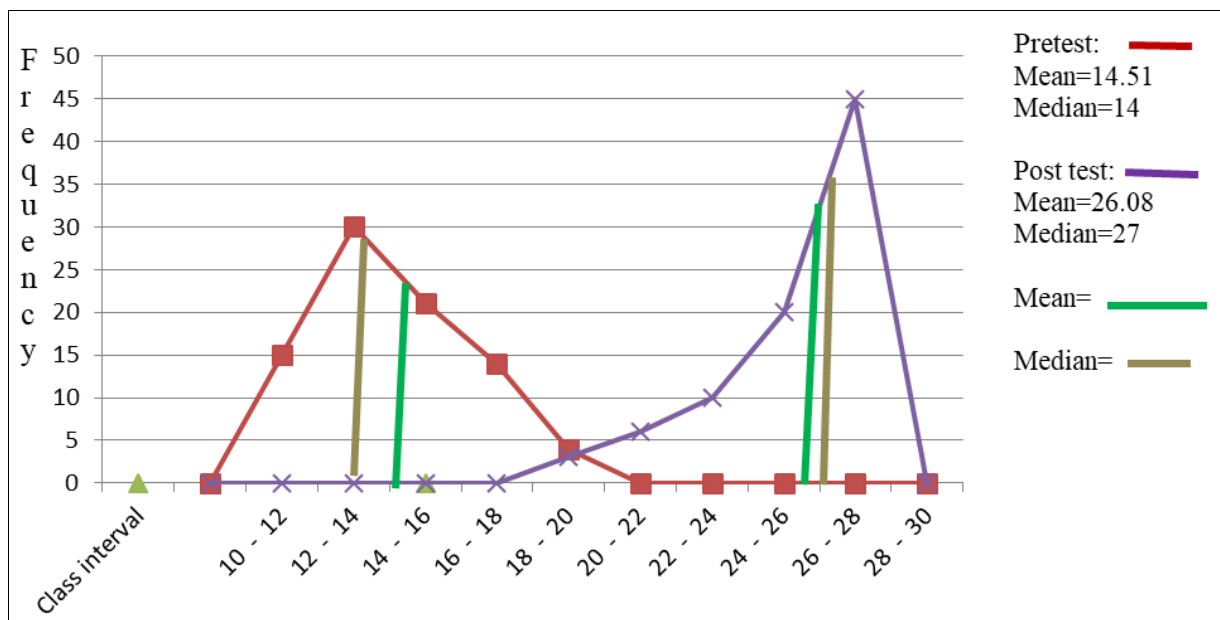
Fig 5: Frequency polygon showing distribution of pretest and post-test knowledge score regarding risk factors and early symptoms of coronary artery diseases

Section III: This section deals with the effectiveness of the educational intervention by comparing the pre-test and post-test knowledge scores

H0: After administration of the educational intervention, there is no significant difference between the mean pre-test knowledge score and the mean post-test knowledge score of the higher secondary school teachers at 0.05 level of significance.

H1: After administration of educational intervention on knowledge regarding risk factors and early symptoms of coronary artery diseases, the mean post-test knowledge score of the school teachers is significantly higher than the

mean pre-test knowledge score at 0.05 level of significance. Frequency polygon in figure 5 showed the distribution of pre-test and post-test knowledge score with depicted mean and median. The pre-test knowledge score range from 10-20 with mean 14.51 and median 14. The post-test knowledge score range from 20-28 with mean 26.08 and median 27. In the pre-test knowledge score mean lies to the right side of the median, so the skewness is +0.07. In the post test knowledge mean lies to the left of the median. So the distribution is negatively skewed and skewness is -1.2. Hence, it could be concluded that the values of the skewness is negligible, indicating that the scores are almost normally distributed.

Table 8: Mean, Median, mean difference, Standard deviation and paired 't' test value of pre-test and post-test knowledge score of school-teachers, N=84

Knowledge Score	Mean	Median	Mean difference	SD	T-Value
Pre-test	14.51	14	11.57	2.23	34. 52
Post-test	26.	08	27	2.16	

T'=1. 98; DF (83); p=0. 05

Data presented in the table 8 revealed that the mean post-test knowledge score (26.08±2.16) of the school teacher was apparently higher than the mean pre-test knowledge score (14.51±2.23) with a mean difference of 11.57.

Paired "T" value was computed from the above data which was found statistically significant as evident from corresponding 't' value (34.52) indicating that the mean difference (11.57) was a true difference and not by chance. Hence null hypotheses (H$_0$) was rejected and research

hypotheses (H$_1$) was accepted. So, it could be concluded that the educational intervention regarding risk factors and early symptoms of coronary artery diseases was effective in increasing the knowledge of school teachers.

Section IV: This section deals with the association of knowledge of school teacher with the selected demographic variables.

Table 9: Chi-Square values showing association between pre-test knowledge score of school teachers according to their age, gender, educational qualification and marital status, N=84

Variables	Knowledge score		χ2	DF	P-Value
	≤ Median	> Median			
Age (in years)					
30-40 yrs.	17	12			
41-50 yrs.	13	14	0.62	2	0.73
51-60 yrs.	15	13			
Gender					
Male	30	29	1.23	1	0.27
Female	16	9			
Educational qualification					
Graduate	17	9	2.113	1	0.15
Post-graduate	28	30			
Marital status					
Married	43	37	0.022 *	1	0.88
Unmarried	02	02			

χ2 DF(1)=3. 84, p = 0. 05 χ2 DF(2)=5. 99, p = 0. 05 * Yates correction done

Table 10: Chi-Square values showing association between pre-test knowledge score of school teachers according to their socioeconomic status and types of family, N=84

Variables	Knowledge score		x^2	DF	P-Value
	≤ Median	> Median			
Socioeconomic status					
Class I(>Rs. 8220/-)	33	25			
Class II (Rs. 4110 to Rs. 8219/-)	4	2	2.15*	2	0.34
Class III (Rs. 2465/- to Rs. 4109/-)	8	12			
Types of family					
Nuclear family	26	18	1.132	2	0.29
Joint family	19	21			

X^2 DF(1)=3. 84; p = 0. 05 X^2 DF(2)=5. 99; p = 0. 05 * Yates correction done

The data presented in the Table 9 showed that chi square test between pre-test knowledge score and selected demographic variables like age in years, gender, educational qualification and marital status was not statistically significant at 0. 05 level of significance. Hence it can be concluded that there was no association between pre-test knowledge score and their age, gender educational qualification and marital status. Thus it can be concluded that the knowledge score of the school teachers in the present study was not dependent of their age, gender, educational qualification and marital status. Data presented in table 10 showed that chi-square value between pre-test knowledge score and socioeconomic status and types of family of school teacher. There was no significant association between pre-test knowledge score and socioeconomic status and types of family of the school teachers. Hence it can be concluded that there was no significant association between pre-test knowledge score of school teachers with their socioeconomic status and types of family. Thus the knowledge score of the school teachers in the present study were not dependent on their socioeconomic status and types of family.

Table 11: Chi-Square values showing association between pre-test knowledge score of school teachers according to their family history of coronary artery diseases, hypertension and diabetes mellitus, information regarding coronary artery disease, attending any sensitization program/workshop/seminar regarding coronary artery diseases.

Variables	Knowledge score		x^2	DF	P-Value
	≤ Median	> Median			
Family history of heart diseases					
Yes	12	9	0.14	1	0.70
No	33	30			
Family history of hypertension					
Yes	25	23	0.10	1	0.75
No	20	16			
Family history of D. M Diabetes Mellitus					
Yes	9	14	2.65	1	0.103
No	36	25			
Information regarding CAD					
Yes	14	19	2.715	1	0.099
No	31	20			

X^2 DF(1)=3. 84; p ≤ 0. 05 X^2 DF(2)=5. 99; p ≤ 0. 05 * Yates correction done

The data presented in the Table 11 showed that Chi square value of association between pre-test knowledge score and selected demographic variables as family history of coronary artery diseases, hypertension and diabetes mellitus and source of information regarding coronary artery diseases was not statistically significant at 0.05 level of significance.

Hence it can be concluded that there was no association between pre-test knowledge score with selected demographic variables as family history of coronary artery diseases, hypertension and diabetes mellitus, source of information regarding coronary artery diseases. Thus it can be concluded that the knowledge of the school teachers on coronary artery diseases in the present study was not dependent on their family history of coronary artery diseases, hypertension and diabetes mellitus and source of information regarding coronary artery diseases.

Results
Major findings of the study
Summarization of Major findings of the study are as below

1. Findings related to demographic characteristics of the study samples
- Maximum (34.53%) of school teacher belongs to the age group of 30-40 years
- Majority (70.24%) of the school teachers were male.
- Most (95.24%) of the school teacher were married.
- Majority (69.05%) of the school teacher had post graduate level of education.
- Majority (69.05%) of school teachers belong to upper class of socio economic status.
- Majority (52.38%) of the school teacher were belongs to nuclear family.
- Majority (75%) of the school teacher did not have family history of coronary artery diseases. Maximum (25%) of them have family history of coronary artery diseases.
- Majority (57.14%) of them had family history of hypertension.
- Majority (72.62%) of the school teacher did not have family history of diabetes mellitus.
- Majority (75%) of the school teacher were not received information about coronary artery diseases. Data also depicted that maximum (25%) of study participant received information about coronary artery diseases from books, magazines and newspapers.
- All (100%) school teachers had not attended any sensitization program/workshop/ seminar regarding coronary artery diseases.

2. Findings related to knowledge level of the school teachers
- Majority (53.57%) of the school teachers had poor knowledge and maximum (46.43%) had average knowledge in the pre-test and no one scored good or excellent.
- Most (77.38%) of the study participants scored excellent knowledge and maximum (22.62%) scored good knowledge in post test
- The maximum modified gain score (0.92) took place in the area of meaning and concept regarding coronary artery diseases and the minimum modified gain score (0.69) was observed in the area of signs and symptoms of coronary artery diseases.

3. Effectiveness of educational intervention on knowledge regarding risk factors and early symptoms of coronary artery diseases among school teachers

- The mean post-test knowledge score (26.08±2.16) of the school teachers was significantly higher than the mean pre-test knowledge score (14.51±2.23) with a mean difference of 11.57.
- Paired 't' value was computed from the above data which was found to be statistically significant as evident from corresponding 't' value (34.52) was more than the tabulated value ('t'=1.98) for DF (8) indicating that the mean difference (11.57) was a true difference and not by chance.

4. Findings related to association between pre-test knowledge and selected demographic variables

- There was no statistically significant association between pre-test knowledge score and selected demographic variables (age, gender, educational qualification, marital status, socioeconomic status, types of family, family history of coronary artery diseases, hypertension and diabetes mellitus, any information received about coronary artery diseases and any sensitizing program attended on coronary artery diseases) at 0.05 level of significance.

Thus the knowledge of the school teachers on coronary artery diseases in the present study was not dependent on their demographic variables.

Discussion
On the basis of the finding of the present study and objectives of the study, a discussion was made

- Discussion related to demographic variables of school teachers
- Discussion related to knowledge of school teachers
- Discussion related to effectiveness of educational intervention regarding risk factors and early symptoms of coronary artery diseases
- Discussion related to association between pre-test knowledge with selected demographic variables

Discussion related to demographic variables
In the present study shows that Maximum (34.53%) of school teacher belongs to the age group of 30-40 years, majority (70.24%) of the school teachers were male, most (95.24%) of the school teacher were married, majority (69.05%) of the school teacher were post graduate level of education, majority (69.05%) of school teachers belong to upper class of socio economic status, majority (52.38%) of the school teacher were belongs to nuclear family, majority (75%) of the school teacher did not have family history of coronary artery diseases. Maximum (25%) of them have family history of coronary artery diseases, majority (57. 14%) of them had family history of hypertension, majority (72.62%) of the school teacher did not have family history of diabetes mellitus, majority (75%) of the school teacher were not received information about coronary artery diseases, maximum (25%) of study participant received information about coronary artery diseases from books, magazines and news-papers. All (100%) school teachers had not attended any sensitization program/workshop/ seminar regarding coronary artery diseases. The present study was partially supported by the study of Majumder Suprabha

(2019) conducted on "Effectiveness of a planned teaching program on risk factors and symptoms of Coronary Heart Disease among school teachers of selected higher secondary school at rural area in Nadia district, West Bengal". The study findings revealed (60%) of the teachers were within the age of 25 to 34 years, most (80%) of them were male, most (93.33%) of the participants were belongs to Hindu religion, majority of the teachers (56.66%) were having Master's Degree, most (86.66%) of them were vegetarian. Among the teachers maximum 26.66% had habit of smoking, majority 66.66% of them had not mentioned their habit of smoking [26].

The present study also partially supported by the study conducted by Ofoegbu CC, Okedo-Alex IN, Ilika AL, Ifeadike CC (2018) on a comparative cross-sectional study on Awareness of Cardiovascular Diseases and Knowledge of Cardiovascular Risk Factors and Risk Reduction Measures among primary school teachers in Anambra state, South-Eastern Nigeria, both urban and rural. The study findings indicated that majority of the school teachers belongs to age group of 38-59 years and mean age was 50. 78±5.13 years, most (97.81%) of the school teachers were females, most (90%) of the participants were married, majority (72.34%) of the study participant received information about coronary artery diseases from TV and Radio, magazines and news-papers [33].

The present study also partially supported by the study conducted by IF Familoni, OA Moronkola, OB Familoni (2021) on Knowledge, Attitude and At-Risk Behaviour for Heart Diseases among Secondary School Teachers in Ibadan Metropolis. In the study majority (61%) of the study participants were female, majority (58.5%) of them were in the age group of over 40 years with a mean age of 40.2±3.1 years [31].

Discussion on the level of knowledge in pre-test and post-test in relation to other study
In present study researcher found that in pre-test majority (53.57%) of school teachers had poor knowledge and (46. 43%) of them had average knowledge and no one scored good or excellent knowledge. But in post-test most (77. 38%) of school teacher had excellent knowledge and maximum (22.62%) scored well. The post-test knowledge score was significant higher than the pre-test knowledge score.

The present study was partiality supported by the study conducted by Majumder Suprabha (2019) on "Effectiveness of a planned teaching program on risk factors and symptoms of Coronary Heart Disease among school teachers of selected higher secondary school at rural area in Nadia district, West Bengal". The study showed that in pre-test majority 21(70%) (N=30) of school teachers had poor knowledge, maximum 9(30%) of them had average knowledge and no one scored good or excellent knowledge. But in post-test most 25(83.33%) of school teacher had excellent knowledge and maximum 5(16.67%) scored good. The post-test knowledge score was significant higher than the pre-test knowledge score [26].

Discussion on the effect of educational intervention on knowledge (mean and standard deviation) in relation to other study
In present study finding reveals that in post-test mean knowledge score was (26.08±2.16) of the school teacher

was apparently higher than the mean pre-test knowledge score (14.512.23) with a mean difference of 11.57. Paired "t" value was computed from the above data which was found to be statistically significant as evidenced from corresponding 't' value (34.52), indicating that the mean difference (11.57) was a true difference and not by chance. So, null hypotheses (Ho) was rejected and research hypotheses (H) was accepted. So, it could be concluded that the educational intervention on knowledge regarding risk factors and early symptoms of coronary artery diseases was effective and increasing the knowledge of school teachers.

The present study is partiality supported by the study of conducted by Majumder Suprabha (2019) on "Effectiveness of a planned teaching program on risk factors and symptoms of Coronary Heart Disease among school teachers of selected higher secondary school at rural area in Nadia district, West Bengal". The study showed that in post-test mean knowledge score was (28.431.61) of the school teacher was apparently higher than the mean pre-test knowledge score (18.87+3.19) with a 27 mean difference of 9.56. Paired "t" value was computed was found to be statistically significant as evidenced from corresponding 'T' value (29), P=0.05, indicating that the mean difference (9.56) was a true difference and not by chance. So, null hypotheses (Ho) was rejected and research hypotheses [26].

Discussion on association in relation to other study
In present study indicated that the association between pre-test knowledge score and selected demographic variables (age in years, gender, educational qualification, marital status, socioeconomic status, type of family, family history of coronary artery diseases, hypertension and diabetes mellitus, source of information regarding coronary artery diseases) was not statistically significant at 0.05 level of significance. Thus the knowledge of the school teachers on coronary artery diseases in the present study was not dependent on their demographic variables

The present study is partiality supported by the study conducted Majumder Suprabha (2019) on "Effectiveness of a planned teaching program on risk factors and symptoms of Coronary Heart Disease among school teachers of selected higher secondary school at rural area in Nadia district, West Bengal". The study result found that there was no significant association between pre-test knowledge score and selected demographic variables (age in years, gender, educational qualification, marital status, socioeconomic status, type of family, family history of coronary artery diseases, hypertension and diabetes mellitus, source of information regarding coronary artery diseases) was not statistically significant at 0.05 level of significance. Thus the knowledge of the school teachers on coronary artery diseases in the study was not dependent on their demographic variables [26].

Implication of the study
The findings of the study has several implications for nursing practice, nursing education, nursing administration and nursing research.

Nursing practice
Coronary artery disease is one of the major problem in our society and country. Prevention of the coronary artery diseases is possible if proper knowledge is provided in time.
- The nurse can planned for health education program among the school teachers to provide adequate knowledge on the risk factors and early symptoms of coronary artery diseases to prevent coronary artery diseases in higher secondary school teachers and their family members.
- In the present study findings revealed that the appropriate teaching will improve the knowledge regarding risk factors and early symptoms of coronary artery diseases among the samples.

Nursing education
- Education on risk factors and early symptoms of coronary artery diseases, helps the nursing students to prepare themselves in practicing prevention strategies of coronary artery diseases.
- Student nurses can utilize the technique in health education program to the people

Nursing Administration
- It is the responsibility of the nurse to motivate the nursing personnel to participate and conduct health education programs on various aspects.
- The nurse administrator should plan to organize teaching program for nursing personnel, in order to prepare them to impart knowledge to the community people.
- The nursing administrator have more responsibilities as supervisor to organize awareness program among all nursing personnel regarding prevention of coronary artery diseases.

Nursing Research
- Longitudinal research could be done to focus on the life style modification in relation to coronry artery diseases.
- The study findings would help to expand the quality of nursing service.
- There is a need for extensive research in the area of knowledge on risk factors and early symptoms of coronary artery diseases.
- The findings of the study would help to expand the scientific body of professional Knowledge upon which further research can be conducted.
- Researches should publish the research findings carried out regarding effect of educational intervention on knowledge regarding risk factors and early symptoms of coronary artery diseases among higher secondary school teachers in professional Journal to disseminate the research finding and its implication in nursing society.
- Nurse researches can be motivated, so that they conduct research in the same and different specialties and thereby profession independence can be achieved.

Limitation
The school teachers exhibited their impatience during data collection procedure due to their busy work schedule.

Recommendations
- A similar study can be conducted at community people.
- A comparative study can be done to find out between the rural and urban population on knowledge regarding risk factors and early symptoms of coronary artery diseases.
- A similar study can be replicated with larger sample size and in various other settings.

- A study can be conducted by using other teaching methods like video assisted teaching, information booklet etc.
- A study can be done to assess the quality of life of a patients with coronary artery disease.

Conclusion

Among the common heart diseases, coronary artery diseases can be prevented if proper knowledge is provided at proper time at an early stage or before occurrence. The study findings indicate that the school teacher had inadequate knowledge regarding risk factors and early symptoms of coronary artery diseases as determined by pretest knowledge score, that is majority (53.57%) of them had poor knowledge score, maximum (46.43%) of them had average knowledge score, and no one had scored good or excellent knowledge. There were low modified knowledge score in the area of diagnosis and signs and symptoms. But in the post test most (77.38%) of the school teachers had excellent knowledge score and maximum (22.62%) scored well. After assessing the post-test level of knowledge, the intervention is proven effective. Modified gain score in the area of knowledge on signs and symptoms of coronary artery diseases was poor that was 0.69. So, it can be concluded that more educational intervention is need to be conducted to increase the level of knowledge.

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