ORIGINAL ARTICLE

HEALTH COMMUNICATION METHODS FOR INCREASING AWARENESS AND KNOWLEDGE ABOUT RISK FACTORS FOR CORONARY HEART DISEASE" A RANDOMIZED COMMUNITY INTERVENTION TRIAL

Surya Fazal Hashmi[a*], Muhammad Zubair Jafar[b], Muhammad Jafar Saleem[C], Farida Nasir Khan[a], Anila Kanwal[a], Khawar Abbas Chaudhry[d]

[a]Institute of Public Health, Lahore. [b]University Plaza, Youngstown, Ohio, USA. [c]EPI dept. DGHS, Punjab. [d]Continental Medical College, Lahore.

ABSTRACT:

INTRODUCTION: Coronary heart disease is a major reason of mortality worldwide. Approximately 17 million deaths are anticipated to be due to cardiovascular disease every year. More than 75% of these deaths take place in developing countries. Pakistan is suffering from burden of communicable and non-communicable diseases.[1]

AIMS & OBJECTIVE: To compare health communication methods to increase awareness and knowledge about risk factors of coronary artery disease and relate them to the different levels of knowledge using two different methods of communications.

MATERIAL & METHODS: A randomized community intervention trial was conducted among the general population of age 30 − 45 years residing in LHW's covered area of Gulberg town, union council 54 of Lahore. A pre-intervention survey comprising randomly selected 280 individuals was conducted by using a structured questionnaire for assessing knowledge. Random allocation was used to distribute the study subjects into two groups i.e. group A and group B. Intervention was done by individual approach in group A and by group approach in group B for increasing knowledge. Same health education message was given to both groups weekly for four consecutive weeks. A post-intervention survey was conducted after one month of intervention. The knowledge level variability was assessed between two different methods of health communications.

RESULTS: High level of knowledge was present in 33% in group A while it was present in 40 % of group B subjects. Between group A and group B, no statistical significant difference was noted in knowledge in pre-intervention period (p-value >0.05). However, 10% in group A and 14% in group B identified physical inactivity as a risk factor for heart disease. A statistical significant difference was noticed in pre-and post-intervention level of knowledge of both groups (p-value<0.05). Moreover, post intervention knowledge score of group A (individual approach), mean rank=162 was higher as compared to group B (group approach), mean rank=119 (p-value<0.05). The results of study had shown association of high level of knowledge with group A, age 40 years or above, education > matric, income >10,000, non-smoker, performing regular exercise, and having personal, family or household history of disease (adjusted odd ratio: 2.183, 1.419, 1.894, 1.099, 2.212, 1.224 1.3, 1.008 and 2.296 respectively).

CONCLUSION: *The result of the study has demonstrated that there is low level of knowledge in general population. Health education interventions can effectively promote public health knowledge and the individual approach is the best method of health communication. Doctors, nurses and LHWs have ample opportunities for imparting health education by individual approach. HE programs thus should be collaborated with the LHW program. The study has also shown that patients and their attendants were more receptive. So, health education department should be established in hospitals. These strategies thus will help to reduce the burden of CHD.*

KEY WORDS: *Health Communication, Knowledge, Risk factors, CHD*

Correspondence : Surya Fazal Hashmi, Institute of Public Health, Lahore. Email: suryajafar@gmail.com

INTRODUCTION:

Coronary heart disease is a major reason of mortality worldwide. Approximately 17 million deaths are anticipated to be due to cardiovascular disease every year. More than 75% of these deaths take place in developing countries.[1-2] Pakistan is suffering from burden of communicable and non-communicable diseases.[3] However little consideration has been given to non-communicable diseases. In Pakistan, burden of CVD´s is expected to be increased because of changes in lifestyle.[4,5]

The INTERHEART study has demonstrated that 90% of first cardiac event can be prevented by public awareness and modification of risk factors for CHD.[6] American Heart Association has suggested a strategy to perk up the cardiovascular health by modifying seven of these factors. These modifiable risk factors are physical inactivity, smoking, obesity, unhealthy diet, diabetes, high cholesterol and hypertension. AHA has not included alcohol drinking in these suggestions.[7]

Prevention is the most effective method to combat the epidemic of CVD's. Knowledge about risk factors has importance which will lead towards prevention of CVD's.[8] Secondary prevention of CHD is also possible by modification of risk factors. It reduces mortality and morbidity and thus improves the quality of life.[9] Lack of knowledge about risk factors is the major reason for increase in CVD's in Pakistan.[10] Low level of knowledge about risk factors is associated with high risk of death.[11]

Multiple health communication methods includes individual and group approach or mass media approach. It is not necessary that each method is appropriate for a particular population subset and may vary according to cultural background, gender, age, qualification and nature of job.[12] A specific method of communication might be very useful in a specific setting on a specific group than others. In health education, the search for the best method of communication for a specific audience is a main area of research. The issue of conveying health education through various methods of communication has remained less lighted part of health education research.[13]

Lack of knowledge regarding modifiable risk factors for coronary artery diseaase is prevalent in our neighbouring country as showed by saeed et al.[14]

The purpose of this research was to compare different health communication methods to increase awareness about risk factors for CHD and relate them to the levels of knowledge using the two different methods of communications.

MATERIAL & METHODS:

A randomized community intervention trial was conducted in lady health workers covered area of union council 54 of Gulberg Town, Lahore. Approval was sought from concerned authorities of City District Government Lahore. Out of 2240 houses covered with LHW program in the selected union council, 360 households were selected randomly. A list of eligible individuals in all selected 360 houses was made. A sample of 280 people was selected from this list using Random Number Tables. The sample was divided into two equal

groups i.e. Group-A and Group- B by random allocation using the random number tables. The LHW's were given training to assist in data collection and imparting health education.

Pre-intervention survey was conducted by the researcher. Structured questionnaire was used for interview. Two different methods of health communication i.e. individual approach (Group A) and group approach (Group B) were used to increase the knowledge about risk factors for CHD. Health education message which includes key messages was given to both groups. In both methods of health communication, health education message was the same and was repeated on weekly basis for four weeks. Post intervention survey was conducted after one month of intervention by the researcher along with lady health workers.

Eight specific risk factors for determination of knowledge included in the study were physical inactivity, smoking, obesity, fatty food, diabetes, hypertension, high cholesterol level and consanguineous marriages. Each risk factor was given a score of 1.A categorical variable of knowledge based upon the number of correctly identifying specific risk factors was created. Two categories were made.

Low Level of Knowledge: If an individual identifies 0 - 5 risk factors
High Level of Knowledge: If an individual identifies 6- 8 risk factors.

This grouping of knowledge was based upon a study that has assessed knowledge of CHD.[14]

Sample size was calculated by using online sample size calculator for comparing two proportions with following formula:

An increase of 5% was made in sample size to account for contingency such as non-response or recording error. Hence sample size was 280 individuals.

Descriptive analyses were performed to assess the distribution of data. Chi-square test/Fisher exact test as appropriate were used to find

$$N = \frac{[z\alpha\sqrt{P(1-P)(1/q1+1/q2)} + z\beta\sqrt{P1(1-P1)(1/q1)} + P2(1-P2)(1/q2)]2}{(P1-P2)^2}$$

association between variables. Mann-Whitney U test and McNemar's test were used to compare two population groups. Adjusted odd ratios, using logistic regression were calculated to show association between increase in levels of knowledge and various factors. All the tests were performed at 5 % (α, = 0.05) level of significance.

RESULTS:

A total of 280 respondents, 140 in each group i.e., group A and group B participated in the study. About 33% in group A and 40% in group B had high level of knowledge. However, this difference in both groups was not statistically significant (p-value>0.05).Mean knowledge score based upon the number of correctly identified risk factors for CHD was 3.97 (50 %) in group A and 4.2 (53 %) in group B (p-value>0.05). Only 5% of respondents (4.3% in group A and 5.7% in group B) were able to identify up to 7 risk factors.

Almost 50% males and 50% females from both groups were enrolled. In population under study, socio-demographic characteristics of the respondents did not differ significantly in both groups (p-value>0.05) About half of the respondents (43% in group A and 49% in group B) were under matric. About half of the respondents (51% in group A and 49% in group B) were having monthly income between 10,000 to 20,000 Rs. Almost two third of the respondents in both groups were living as separate family. Majority of the respondents (92% in group A and 90% in group B) were married. About 50% in group A and 43% in group B are currently employed. Current smokers in this study were about 20% in group A and 14%in group B. Only minority of the respondents (7% in both groups) were doing routine exercise. About 30% in both groups, 63% in group A and 57% in group B and 44% in group A and36 % in group B were having personal, family history and/ or household history of disease* i.e., high blood

Input		Results	
α ○ one sided test ● two sided test [0.05]	Calculate		
β [0.1]	Reset	m	134
P₁ [0.3]			
P₂ [0.5]		N	268
r [1]			

Note:

Variables	Descriptions
α	Significance level
1-β	Power of the test
P₁	Success proportion in arm 1
P₂	Success proportion in arm 2
r	Ratio of arm 2 to arm 1
m	Sample size for arm 1
N	Total sample size for arm 1 and 2

Table 1: Pre-Intervention Knowledge of Specific Risk Factors of the Population Groups. (n=280)

Knowledge of Specific Risk Factors	Group A	Group B	P-value
	Percentage	Percentage	
Smoking	91.4	92.3	.657
Physical Inactivity	10	14.3	.272
Fatty Food	77.1	84.3	.130
Obesity	75.5	81.4	.244
Hypertension	57.1	52.9	.471
Diabetes	35.7	42.9	.221
Cholesterol	48.6	47.1	.811

Table 2: Difference between Pre-and Post-Intervention Levels of Knowledge of Group A and Group B (McNemar's test). (n=140 Group A, n= 140 Group B)

Interventional Levels of Knowledge		Post-intervention		P-value
		Low	High	
		Percentage	Percentage	
Group A Pre-intervention	Low	95.5	61.9	<0.001
	High	4.5	38.1	
Group B Pre-intervention		Post-intervention		P-value
		Low	High	
		Percentage	Percentage	
Pre-intervention	Low	88.9	50.0	<0.001
	High	11.1	50.0	

Table3: Difference between Two Population Groups regarding Pre-and Post-Intervention Knowledge Scores (Mann-Whitney U test). (n=280)

Knowledge Score	Mean Rank	Sum of Ranks	P-value
Pre-Intervention			
Group A	136.28	19079.00	.369
Group B	144.72	20261.00	
Post-Intervention			
Group A	161.77	22648.00	<0.001
Group B	119.23	16692.00	

pressure, diabetes mellitus, high cholesterol and/ or CHD respectively. (p-value >0.05).

Regarding physical inactivity, only 10% in group A and 14% in group B were able to associate. However, there was no statistically significant difference in pre-intervention knowledge about specific risk factors for CHD between group A and group B (p-value >0.05) (Table 1).

Table showed that there was highly statistically significant difference between pre- and post-intervention levels of knowledge of group A and group B (p-value<0.01) (Table 2).

There was no statistically significant difference in both groups regarding pre-intervention knowledge scores (p-value>0.05). The post intervention knowledge score of group A was higher as compared to group B (p-value>0.001) (Table 3).

Table had shown association of high level of knowledge with group A, age 40 years or above, education > matric, income >10,000, non-smoker, performing regular exercise, and having personal, family or household history of disease (Table 4).

Table 4: Adjusted Odd Ratio (Logistic Regression (Full Model)): Association between Level of Knowledge and Various Factors.

Factors	Adjusted Odd Ratio	P-value	95% CI
Interventional Group A	2.183	.017	1.161-3.984
Occupation (Unemployed/Housewives)	1.383	.356	0.663-2.604
Age (40 years or above)	1.419	.320	0.675-2.582
Education (Matric or above)	1.894	.177	0.935-3.394
Family Income (10,000 or above)	1.099	.779	0.457-1.864
Marital Status (Unmarried)	4.167	.069	0.894-15.909
Ever Smoker (Yes)	1.102	.935	0.093-9.828
Current Smoker (No)	2.212	.508	0.212-22.711
Household Smoker (Yes)	1.395	.351	0.348-1.439
Routine Exercise (yes)	1.244	.745	0.384-5.579
Having Personal History of disease	1.300	.488	0.562-2.524
Having Family History of disease	1.008	.982	0.528-2.227
Having Household History of disease	2.296	.024	1.07-4.608

Table5: Adjusted Odds Ratio: Logistic Regression Final Model (Backward Stepwise (Likelihood Ratio)): Association between Knowledge level and Various Factors.

Factors	Adjusted OR	P-value	95% CI
Interventional Group A	1.862	.044	1.104-3.773
Marital Status (Unmarried)	4.098	.063	0.879-12.609
Having Household History of disease	2.233	.016	1.087-4.049

The final model of logistic regression showed a statistically significant difference in knowledge levels of the participants regarding interventional groups (group A and group B) and having household history of disease (p-value<0.05) (Table 5).

DISCUSSION:

The level of knowledge in the present study regarding coronary heart disease was not adequate in majority of the included subjects i.e. 5% of the study participants identified up to seven risk factors according to AHA criteria. These findings were not similar to previous studies done in Western Massachusetts, where the level of knowledge of the participants was adequate i.e. 40% of the study population was able to identify seven factors as mentioned by AHA.[15] but the findings of our study were similar to previously carried out study in Pakistan.[16]

In a study carried out in Karachi , pre-intervention level of knowledge was shown to be around 42% which is quite similar to our study in which 33% of group A and 40% in group B were having good level of knowledge.[3] However, these observations were not similar to a study conducted among cardiac patients in Abbottabad which determined that only 28.7% were having good level of knowledge.

This difference might be due to difference in study setting.[8] These findings emphasize need for educational programs.

The ability to identify risk factors, knowledge gaps were observed. Most commonly smoking was identified as having association with heart disease and it was more than 90% in both of the study groups. Similar findings were noticed in other studies done in past.[3] The findings were also noticed in a study carried in Kuwait in which 80% participants had knowledge about smoking as a risk factor.[17]

Physical inactivity was identified by only a small number of the included population i.e. (10% in group A and 14% in group B). These findings were also noticed in a study carried at Karachi which showed a figure of 25%.[3] This low level knowledge about physical inactivity may be due to lack of educational programs or mass media campaigns.

High cholesterol level and high blood pressure were identified by more than half of the study population while diabetes mellitus was not identified by majority as a risk factor and it was consistent with a study done in India that also showed low level of knowledge about diabetes as

a risk factor.[14] These findings were also shown in a study done at Massachusetts.[15] The prevalence of diabetes is growing worldwide.[18]

Multiple health education and awareness strategies can be adopted for public education as it was indicated in our study that pre and post-intervention, the knowledge level of both groups was better (p-value<0.05).[19]

The level of knowledge in both the study groups, pre-intervention phase was low as compared with post-intervention and was quite significant (p-value>0.05 vs <0.001). It was noticed that using Individual approach was more efficacious than group approach and it was consistent with previous studies.[20]

In present study, method of health communication was an important factor about high level of knowledge (P-value<0.05). The odds of having high level of knowledge were 2.183 times more in group A (individual approach) as compared to group B (group approach) which was similar to studies done in past. After imparting intervention, there was a significant increase in ability to recognize the coronary risk factors (p=0.003).[21]

In participants who were matric, the knowledge was 1.894 times greater than under matric participants (P-value>0.05). These findings were similar to previously done studies.[8,14,22] In the light of these findings, the low education level groups need more awareness through the health education.

The non-smoker participants have a high knowledge i.e 2.212 times more than current smokers (p-value>0.05) which was quite similar to past data.[3]

The participants who had a personal, family and/or household history of diabetes, hypertension, high cholesterol and/or CHD have high level of knowledge i.e 1.3, 1.008 and 2.296 times. Similar findings were observed in a study conducted among cardiac patients.[8]

Patients with CHD are potential candidate for recurrence of the disease until change in lifestyle.[9]

Health education programs are beneficial towards motivational people. Health education program have rapid outcome to the patients and their attendants.[11]The doctors and nursing staff have an important role and can be good health educator in prevention of CVD, by recognizing and modifying risk factors.[23]

Health education interventions can increase public health knowledge and develops changes in society to promote healthy behavior for prevention of CVD's. [24] Moreover, the doctors and nursing staff have an important role in prevention of CVD's by recognition and modification of risk factors and have ample opportunities for health education in hospitals.[25]

The present study had certain limitations. This study was conducted in a particular geographic area. There may be different response in areas with different socio-demographic background.

CONCLUSION:

There is low level of knowledge about risk factors for CHD. Moreover, the study has identified knowledge gaps especially regarding association of exercise and diabetes mellitus with CHD. The study has identified groups having low knowledge particularly young individuals, having low education, low income, sedentary life style and smokers. Health education programs thus should be tailored accordingly.

The result of the study has demonstrated that health education interventions can effectively promote public health knowledge and the individual approach is the best method of health communication. Doctors, nurses and LHWs have ample opportunities for imparting health education by individual approach. HE programs thus should be collaborated with the LHW program. Moreover,the result of the study has shown that patients and their attendants were more receptive. So, health education department should be established in hospitals. This study will help to establish useful communication strategies to promote public health programs for prevention.

References:

1. World Health Organization. Cardiovascular diseases (CVDs) Fact sheet N°317 [Internet]. 2017 [Accessed May 2017]. Available from: http://www.who.int/mediacentre/factsheets/fs317/en/

2. Jafary FH, Aslam F, Mahmud H, Waheed A, Shakir M, Afzal A, Qayyum MA, Akram J, Khan IS, Haque IU. Cardiovascular health knowledge and behavior in patient attendants at four tertiary care hospitals in Pakistan. BMC Public Health. 2005; 5: 124.

3. Khan FS, Lotia-Farrukh I, Khan AJ, Siddiqui ST, Sajun SZ, Malik AA, et al. (2013) The Burden of Non-Communicable Disease in Transition Communities in an Asian Megacity: Baseline Findings from a Cohort Study in Karachi, Pakistan.

4. WHO Regional Office for Eastern Mediterranean. WHO country office in Pakistan, News/ [Internet]. 2013 [Accessed 1 October 2013]. Available from: http://www.emro.who.int/pakistan/news.html

5. WHO Regional Office for Eastern Mediterranean. WHO country office in Pakistan, Programme areas, Non-Communicable Diseases [Internet]. 2010 [Accessed 2010] Available from: http://www.emro.who.int/pakistan/programmes_ncd.htm

6. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas,F, McQueen M, Budaj A, Pais P, Varigos J, Lisheng L. on behalf of INTERHEART Study Investigators. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. The Lancet. 2004; 364(9438) 937-52.

7. American Heart Association. (2010) AHA Special Report: Defining and Setting National Goals for Cardiovascular Health Promotion and Disease Reduction:The American Heart Association's Strategic Impact Goal Through 2020 and Beyond [Internet]. 2010 [Accessed 20 January 2010].

8. Zahid M, Kazmi S, Farooq U, Khan IA, Aziz T, Aziz S, Rahim M. (2014). Knowledge of modifiable risk factors of cardiovascular diseases among patients with acute myocardial infarction. J Ayub Med Coll Abbottabad. 2014; 26(3):364-67.

9. Hall SL, Lorenc,T. Secondary prevention of coronary artery disease. Am Fam Physician. 2010; 81(3): 289-96.

10. Wasif S. (2011). Pakistanis at higher risk of developing heart diseases: Report. [Internet]. 2011 [Accessed 6 March 2011]. Available from: http://tribune.com.pk/story/128350/pakistanis-at-higher-risk-of-developing-heart-diseases-report/

11. Waśniowska A, Kopeć G, Szafraniec K, Kozela M, Sarnecka A, Knap K, Pająk A, Podolec P. Knowledge of cardiovascular disease (CVD) risk factors in population of Małopolska voivodeship in two independent cross-sectional studies. Przegl Epidemiol. 2018;72(1):75-85. PMID: 29667383.

12. Mahajan BK, Gupta MC. Textbook of Preventive and Social Medicine. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2013. pp. 562.

13. Saha A, Poddar E, Mankad M. Effectiveness of different methods of health education: A comparative assessment in a scientific conference. BMC Public Health [Internet]. 2005 [Accessed 22 August 2005]. Available at: http://www.biomedcentral.com/1471-2458/5/88

14. Saeed O, Gupta V, Dhawan N, Streja L, Shin J S, Ku M, Sanjeev- Bhoi S, Sanjay-Verma S. Knowledge of modifiable risk factors of Coronary Atherosclerotic Heart Disease (CASHD) among a sample in India. BMC International Health and Human Rights, [Internet]. 2009 [Accessed 4 February 2009]. Available from: http://www.biomedcentral.com/1472-698X/9/2

15. Wartak SA, Friderici J, Lotfi A, Verma A, Kleppel R, Naglieri-Prescod D, Rothberg MB. Patients' Knowledge of Risk and Protective Factors for Cardiovascular Disease. Am J Cardiol. 2011; 107(10): 1480-8.

16. Dodani S, Mistry R, Khwaja A, Farooqi M, Qureshi R, Kazmi K. Prevalence and awareness of risk factors and behaviours of coronary heart disease in an urban population of Karachi, the largest city of Pakistan: a community survey. J Public Health (Oxf). 2004; 26(3): 245-9.

17. Awad A, Al-Nafisi H. Public knowledge of cardiovascular disease and its risk factors in Kuwait: a cross-sectional survey. BMC Public Health. 2014; 14(1): 1131

18. Wild S, Roglic G, Green A, Sicree R, King H. WHO-global prevention of diabetes: estimates for the year 2000 and projections for 2030. Diabetes Care. 2004; 27: 1047-53.

19. Mooney LA, Franks AM. Impact of health screening and education on knowledge of coronary heart disease risk factors. J Am Pharm Assoc. 2011; 51(6): 713-8.

20. Ebrahim S, Taylor F, Ward K, Beswick A, Burke M, Davey-Smith G. Multiple risk factor interventions for coronary heart disease [Internet]. 2013 [Assessed 28 February 2013]. Available from: http://summaries.cochrane.org/CD001561/multiple-risk-factor-interventions-for-coronary-heart-disease

21. PowersBJ, Danus S, Grubber JM, Olsen MK, Oddone EZ, Bosworth HB. The effectiveness of personalized coronary heart disease and stroke risk communication. Am Heart J. 2011; 161(4): 673-80

22. Varghese S. Knowledge regarding cardiovascular risk factors among people in South India: a community-based study. Nitte University Journal of Health Sciences. 2014; 4(1): 42-5.

23. Park K. Park's Text Book of Preventive and Social Medicine. 23rd ed. Jabalpur: Banarasidas Bhanot Publishers; 2015. pp. 760-6.

24. Aminde LN, Takah N, Ngwasiri C, et al. Population awareness of cardiovascular disease and its risk factors in Buea, Cameroon.BMC Public Health. 2017; 17:545.

25. Verma A, Mehta S, Mehta A, Patyal A. Knowledge, attitude and practices toward health behavior and cardiovascular disease risk factors among the patients of metabolic syndrome in a teaching hospitalin India. J Family Med Prim Care [serial online] 2019 [cited 2019 Nov 26];8:178-83. Available from: http://www.jfmpc.com/text.asp?2019/8/1/178/251150