A Study to Evaluate the Effectiveness of an Information Booklet on Knowledge of Angina Pectoris Among Individuals in a Selected Rural Area

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***Abstract*—Angina pectoris is a common clinical sign of coronary artery disease and remains an important public health problem, particularly among the rural population where there is inadequate knowledge and perceptions of heart health. The present study was aimed to assess the effectiveness of an information booklet to improve knowledge on angina pectoris among the adult males in selected rural area of Rajasthan.**

A quasi-experimental one group pre-test and post-test design was adopted. A total of 100 male adults aged 25 to 50 years-old were selected by non-probability convenience sampling. Structured knowledge questionnaire was used to collect data before and after educational intervention. The booklet shared knowledge and facts about the causes, signs and symptoms, risk factors, preventions and treatment of angina pectoris, which is evidence-based.

The results revealed that before the intervention, the percentage of poor knowledge was 61% and 3% before the intervention was good knowledge. 83% of the participants obtained good knowledge after information booklet; there was no participant who stayed in the poor knowledge category. The mean knowledge score of the pre-test (6.4 ± 2.9) was significantly different from the mean score of the post-test (16.0 ± 2.5) ($t = 24.4$, $p < 0.001$). There was a significant relationship between the knowledge levels and monthly income and exercise habits.

The study concluded, that information booklet, is a good, more economic and cheaper educational tool for increasing awareness of people about angina pectoris among rural male adults. It could help in the community-based cardiac health promotion programs.

***Index Terms*—Angina pectoris, coronary artery disease, information booklet, knowledge assessment, angina awareness, cardiovascular health, rural adults, health education, coronary risk factors, educational intervention.**

I. INTRODUCTION

Angina pectoris is an often-seen clinical manifestation of coronary artery disease (CAD). It is usually referred to as pain, tightness, or pressure in the chest due to decreased blood flow to the heart muscle causing myocardial ischemia because of the imbalance between the activity of the heart muscle and the available oxygen. Stable angina typically is not life-threatening, but it can be a serious signal that more serious heart problems are ahead, including myocardial infarction and stroke.

Angina pectoris imposes a significant disease burden worldwide, impacting millions of people, decreasing their quality of life, their working capacity, and health-care costs. Angina affects more than 7.8 million people in the U.S. and an estimated 500,000 people are newly diagnosed in the United States with chronic stable angina annually. Epidemiologic data show that ischemic heart disease is still the degree one killer of people worldwide, with more than 23% of death due to coronary heart disease in some areas.

Although angina mortality rates have declined in most developed counties due to the improvements of

the facilities for diagnostics and treatment, the issue of angina is still a prevalent one. Especially in low- and middle-income countries, limited access to preventive services and insufficient health education further exacerbates the risk.

The signs and symptoms of angina vary depending on the type of angina. While unstable angina is sudden and unpredictable, happening at random and calls for urgent treatment, stable angina typically happens during exercise and subsides with rest or with nitroglycerin. Microvascular dysfunction is also known as a key contributor to the development of angina with the exception of obstructive coronary artery disease, it is observed among population even among the females who may present with angina symptoms but may have normal major coronary arteries on angiography.

However, risk factors for angina are an important factor, and the main risk factors for developing angina are hypertension, diabetes mellitus, dyslipidaemia, obesity, smoking, physical inactivity and psychological stress. -if these factors aren't determined and controlled, the angina can gradually develop into more serious complications like myocardial infarction, stroke or sudden cardiac death.

Patient education and lifestyle modification are important in prevention and management of angina pectoris. Cardiovascular morbidity and mortality can be greatly diminished with regular physical activity, quitting smoking, healthy eating habits, weight control, and better control of blood pressure and blood glucoses. Using educational materials like information booklets and structured counselling has proven helpful to enhance awareness, adherence to preventative practices, and lower symptoms recurrence.

Yet there are still critical knowledge and practice gaps especially in rural and resource-limited settings, where there is low health literacy and few organized educational programmes. In India, heart disease is one of the major sources of death and is being more prevalent among the rural population. Adult males are more susceptible because of work stresses, smoking of tobacco, unsuitable nutrition intake and the inadequate access to health-care solutions.

So, it is reasonable to conclude that simple and inexpensive educational resources like information booklets can fill the gaps in people's existing knowledge and influence positive behavior change to be more protective of health. Therefore, the present study was conducted to assess the effectiveness of information booklet to improve knowledge about angina pectoris among the adult males of select rural area.

II. NEED OF THE STUDY

Though it is already accepted that coronary artery disease (CAD) is one of the earliest and common clinical manifestations and is still one of the leading causes of death in India and worldwide, angina pectoris (AP) stands as a major part. While significant progress has been made in the diagnosis and treatment of cardiovascular diseases, many people, particularly in the rural regions and in resource poor countries, remain poorly informed about the diagnosis, risk factors and prevention of angina pectoris.

This lack of awareness can contribute to delayed medical help-seeking, and missed/late diagnosis, slow uptake of preventive strategies, and increased risk for serious outcomes like myocardial infarction, stroke, and sudden cardiac death. Rural male in the age group of 25-50 years are particularly susceptible groups, since they frequently are exposed to modifiable risk factors including smoking, insufficient physical exercise, diet, work stress and poor utilization of formal health-care services.

Health literacy plays a critical role in recognizing early signs and symptoms of heart disease, getting prompt medical care, and making lifestyle changes. But, in rural areas, people do not necessarily possess sufficient fundamental knowledge about the heart. In rural environments, educational interventions, such as structured information booklets could be low-cost, easy to supply, and have ready acceptance. All the while enhancing the awareness of the community, such materials assist a community to present complex medical information in a clear and understandable manner.

Given the rising burden of coronary artery disease in rural India and the need to identify the symptoms of angina early on, there was a great need for community based and the cost-effective education strategies. This paper is an attempt to meet this need by evaluating the effectiveness of a structured information booklet developed and tested amongst men of rural adults population from Rajasthan. The results could enable policymakers and health-care workers such as community health workers and primary health-care providers to incorporate such educational interventions into their regular health promotional efforts to lower the risk of long-term cardiovascular disease.

III. METHODOLOGY

Study Design and Approach

Pretest and posttest were used with one group that adopted a quasi-experimental design was chosen to evaluate the effectiveness of an information booklet about knowledge about angina pectoris in adult men. This design allowed, for comparing the knowledge level of the participants before and after the educational forays in the same group.

Study Setting

The study has been carried out in a particular rural community in Rajasthan, India. The setting was selected because it would represent the target population and would make it possible to conduct the data collection in the setting.

Study Variables

Participants' knowledge was promoted by the dissemination of an information booklet on angina pectoris which served the independent variable. The dependent variable measured was knowledge and measured with a knowledge structured questionnaire.

Population and Sampling

Adult male (25–50 years) who were in rural communities constituted the population of these studies. The accessible population comprised of adult males residing in selected rural area of Rajasthan region and met the eligibility criteria and accepted to participate in the study.

Only adult males age 25 to 50 years who consented to participate voluntarily and signed written informed consent were included. Those who refused to be involved and those outside of the age range were not included.

100 participants were randomly chosen for this study. A non-probability convenience sampling technique was used which is considered appropriate in conducting field studies in its community setting.

Data Collection Tool

Data collection was through a structured knowledge questionnaire. It has been created following a thorough literature review and expert consultation. The tool was divided into three parts.

The demographic data including age, education, occupation, family type, monthly income, marital status, religion, consumption of food items and preference of physical activity were gathered from the first part. Twenty multiple choice questions were provided in the second section to judge the knowledge about risk factors, symptoms, prevention, and management of angina pectoris. The third section was the information booklet which was used as the educational intervention.

Validity and Reliability

The validity of the tool was carried out based on content by experts from the field of cardiology and nursing. The experts reviewed the questionnaire for relevance, clarity and completeness. They provided a few suggestions to change the tool so that it will be more accurate and of better quality and these were made.

Questionnaire was translated to Marathi so that the participants feel better understanding of it. Reliability was done by giving the questionnaire to 20 participants from a similar setting who met the inclusion criteria. Various results showed that the internal consistency of the instrument was acceptable showing reliability in collecting the data.

Pilot Study

Before the start of the study, a pilot study was carried out with the 10 respondents from a rural community in the Rajasthan. The pilot study was to evaluate the feasibility of the research design, clarity of the questionnaire and suitability of the data collection

procedure. Based on the pilot results, some minor modifications were made. Those that took part in the pilot study were not used in the study.

Data Collection Procedure

Prior to data collection formal permission was sought from local authorities and community leaders. The participants were informed regarding the purpose of the study and assured on confidentiality; written informed consent was obtained.

The data collection process was done in 3 phases. In the first phase, a pre-test was taken with the structured knowledge questionnaire to determine the pre-test knowledge about angina pectoris. At the second phase, the information booklet containing objective evidence about the causes, risk factors, symptoms, prevention and management of angina pectoris was provided. In order to have a proper understanding of the booklet, the contents of the booklet were explained to the investigators. The post-test in the third phase was carried out by the same questionnaire to see the improvement of knowledge after intervention.

Data Analysis

Data obtained were coded organized and entered in a master sheet for analysis. Data collected were analyzed using SPSS. Demographic information and knowledge scores were summarized by descriptive statistics, such as frequency, percent, mean, and standard deviation.

An inferential statistics method was used to analyze the effectiveness of the intervention. An paired t-test was used to compare the difference between the mean knowledge score pre and posttest. The Fisher's exact test was used for associations between the demographic variables and the knowledge levels.

For inference purposes 95% confidence interval was formed and level of significance was taken $p < 0.05$. Statistically significant results were obtained from p-values < 0.05.

IV. RESULTS

The total populations reached were 100 adult male in the selected rural area. The age distribution was 32.1 ± 9.9 years with most being young to middle aged. Prior to the intervention, little was known about angina pectoris, its risk factors, prevention and management by the participants. This led to the implementation of an educational intervention for rural adult males, which was structured.

The age group of 20-30 years was the most common amongst majority of the participants followed by 31-40 years age group. Fewer proportion were in the 41-50 years and above 51 years age group. Education wise, almost half of the students were undergraduates followed by secondary, post graduate and primary education. In terms of occupation, the largest group of all participants was employed in service followed by business then daily wage and masonry work.

The number of people who had a nuclear family was more than half and the remaining were from joint or extended family. Most of the respondents earned Rs. 20,001 and Rs. Those earning Rs. 30,000 were next, followed by those who earned Rs. 30,001 and above. Majority of the participants were unmarried with a considerable predominance of the Hindu religion. As per dietary pattern, majority (more than 50%) ate mixed diet whereas the remaining dietates were vegetarian or non-vegetarian.

The most frequently exercised activity was walking, followed by swimming, cycling and meditation. In the pre-test, it was found that the percentage of poor and average knowledge about angina pectoris was 61% and 36% respectively, while 3% had good knowledge about angina pectoris. There was a marked improvement after administering the information booklet. No individual who was initially in the poor knowledge category stayed there. 83% of responses in the post test showed a good knowledge rating and 17% showed an average knowledge rating.

There was a mean difference of 9.6 points between the pretest and posttest mean knowledge scores (6.4 ± 2.9 points before the intervention, 16.0 ± 2.5 points after the intervention). The p-value of the paired t-test was < 0.001 with 99 degrees of freedom.

This means it was statistically highly significant that there was an increase in people's knowledge after the provision of an information booklet. Results on an item basis also revealed improvements in each of the knowledge areas. Pre-intervention, 40, 32 and 44 percent respectively knew the correct answer of identifying angina pectoris, knowing the signs and

understanding the main cause of angina pectoris. Even knowledge about risk factors was low with only 34% of respondents answering correctly. Only 24% were knowledgeable on what kinds of angina patients were suffering from and 21% on what usually relieves angina pain. The least awareness was observed regarding angina vs heart attack with correct answers provided given by only 10%.

Following the intervention, there was a significant rise in knowledge in all domains assessed. RR 97% answered the question of angina pectoris correctly, 94% understood the symptoms and 95% understood the primary cause. The percentage of knowledge of Risk Factor has risen from 34% to 91% and the percentage of knowledge on the type of Angina has risen from 24% to 78%.

There was an appreciable rise in knowledge of lifestyle modification for prevention and management after booklet was introduced. An improved awareness regarding diagnostic assessment, therapeutic targets, acute situations, and management pertaining to angina pectoris was observed among participants as well. There was significant change in the difference between angina and heart attack after the pretest at 10%, and the post test at 58%.

There was a general improvement in all knowledge areas, which shows that the information booklet was successful in improving the participants' understanding of angina pectoris. When the relationship between demographic variables and knowledge level was examined, there was no significant relationship between age, education, occupation, types of family, marital status, religion and dietary habits and knowledge. But there was a highly significant association between monthly income and knowledge level (p value = 0.048). The second and third variables (blood pressure level, and exercise practices) were also statistically significant at the p-values of 0.036 and 0.027, respectively.

This indicated that there was comparatively higher knowledge about angina pectoris among the participants in higher income group and who were involved in regular physical activity. From the overall results, it can be seen that the use of structured information booklet in improving rural adult male's knowledge of angina pectoris was effective. This big gap between before and after knowledge scores demonstrates that the learning was a positive effect of the educational intervention.

V. DISCUSSION

Quasi-experimental study was done among the rural male adults in Rajasthan and it was found that information booklet had brought about a significant difference in knowledge about angina pectoris. The mean before-after knowledge score was 6.4 ± 2.9 to 16.0 ± 2.5, respectively, which was a good aftereffect of the booklet to increase the understanding of the condition.

The positive change found in this study corroborates the current literature that structured cardiovascular health education interventions lead to an increase in knowledge and positive health behaviours. There is evidence that comparable community-based education interventions have been associated with benefits in terms of raise in awareness of CHD or CHD risk factors. Giving education things that are simple, and organized, can help make symptom, risk factors, prevention and management more understandable.

When looking item-wise findings it was found that there were improvements in different fields such as symptoms, risk factors, prevention and management of angina pectoris. There was increased knowledge, for example, in distinguishing between angina and myocardial infarction, where there was baseline knowledge of very limited proportions. This shows that the information booklet was useful in answering some key gaps in knowledge on cardiovascular health.

The results are particularly important in rural settings, where there is often low awareness of cardiovascular risk and there are significant modifiable risk factors. Information booklets, as an example of low-cost educational interventions, are feasible and relevant in these contexts, especially if access to e-health or specific health education is unavailable or insufficient.

The results of the study are also aligned with contemporary methods to managing coronary disease that include lifestyle modification, risk factor control, adherence, and patient education. The content of the booklet; symptoms, triggers, risk factors, prevention

and management was suitable for raising awareness and promoting early health-seeking behaviours.

Association between monthly income and the knowledge level and between exercise habits and the knowledge level was also found to be significant. There was a possible positive relationship between baseline knowledge and income level and regular physical activity. This implies that in the future greater attention should be paid to implementing some health education programmes for the lower income groups and individuals with poor lifestyle.

There are several strengths in the study such as clearly planned intervention, structured and validated questionnaire and complete pre and post test data from 100 participants. But there were also some drawbacks. A single group design without a control group was used in the study; therefore, there are only limited possibilities for comparing the findings to an untreated group. There may also have been response bias, as some information was self-reported. Further, this study measured short term knowledge gain, not long-term behavior changes or clinical benefits.

The next step in the research should be to implement control groups and follow-up periods of several years, to investigate if the acquisition of knowledge can be linked to long term lifestyle change and improved health status. potentially cost-effective studies could also serve as an indication of whether or not to expand such interventions at larger scales.

Implications

In rural and resource limited communities, simple explanation together with a short, culturally appropriate information booklet, can make a great difference in angina pectoris knowledge. Such educational content can be integrated into community health education, outpatient providers, village health education, and into home visits provided by health workers. This can improve awareness, assist people to recognise the signs and symptoms early and seek help for coronary artery disease.

VI. CONCLUSION

A key part of the prevention of cardiovascular diseases is health education. This paper emphasizes the importance of organized community education in increasing awareness on angina pectoris among the rural adults. Using a simple and culturally appropriate information booklet proved to be practical, sustainable and effective in terms of improving knowledge about preventive measures, warning signs and healthy lifestyle practices.

All such low-cost education delivery activities could be a part of primary diagnosis health care, and help to alleviate the burden of angina pectoris and to sustain the general cardiovascular health promotion activities especially in the rural areas with limited health resources. Future programmes should be directed at the replication of these interventions to other populations and studies of the long-term effects on behaviour change and clinical effects.

Conflict of Interest

All the authors declare the absence of conflict of interest with respect to this study.

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