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REVIEW ARTICLE

A REVIEW OF RISK FACTORS FOR PRIMARY PREVENTION OF CARDIOVASCULAR DISEASES IN PAKISTAN

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ABSTRACT

The feasibility of instituting primary prevention of cardiovascular diseases in Pakistan was explored. For this purpose the reports of Metroville Health study (MHS) were reviewed in light of the experience of developed countries. The MHS showed that it is possible to implement risk factor modification study in lower middle class urban community in Pakistan. Diet was significantly modified; awareness of risk factor was enhanced. Mild reduction in serum cholesterol was achieved in over one year of intervention. After 5 years of intervention the awareness regarding cardiovascular diseases and the effect of risk factors on the genesis of heart diseases remained high. The current smokers' prevalence decreased significantly and serum cholesterol showed decrease, though not statistically significant. Physical activities improved, Blood pressure showed no change and BMI was increased in the intervention group. The non adherence increased after 5 years. It is concluded that it is possible to implement risk factor modification in a lower middle class community in Pakistan. For sustained intervention to impact mortality and morbidities the community needs to remain engaged which can be achieved by establishing a community center.

Keywords: Community intervention, Community health delivery, Primary prevention, Risk factors.

INTRODUCTION

In the developed world primary prevention by risk factors modification at the community level has shown modest success in the short term[1-7]. But for North Karelia study, the long-term results in other studies are unknown[1-3]. The feasibility of modification of risk factors in the developing countries is largely undetermined. The recent WHO data shows that the epidemiologic transition from communicable to non-communicable diseases is occurring at a fast rate in the developing world[4-6]. In the developed world non-communicable diseases have replaced the communicable diseases[7-9]. This transition in developing world is occurring when communicable diseases are still prevalent. The large part of deaths due to cardiovascular disease are occurring in the developing countries while in developed countries the death rates due to cardiovascular diseases are falling[10].

This review was done to find out of primary prevention by risk factor modification is feasible at the community level in Pakistan. There is no doubt that there is an urgent need of primary prevention of cardiovascular diseases in Pakistan. The high cost of secondary prevention is prohibitive for large population of Pakistan.

Metroville health study (MHS), conducted during the 1995-2000 is the only risk factor modification study undertaken in a lower middle class urban Pakistani community[11-13].

METHODOLOGY

The published and unpublished reports of MHS (14-21) and similar community studies in the developed countries[1-4] were reviewed. National level and targeted risk factor modification studies were excluded.

Metroville Health Study

The study was a household based study conducted in 1995 to 2000 period. It was a

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randomized controlled intervention study targeting all the risk factors for modification in a low middle class urban community (LMCUC), situated in the environs of Karachi. The study showed that risk factors were significantly prevalent in the community as well as other LMCUC of Karachi[14-17]. Even in children the risk factors are significantly prevalent[18] and obesity is increasing at an accelerated rate[19]. The study targeted all of the risk factors, diet modification involved, direct interaction with the household cooks and smoking and sedentary life styles through health camps, one to one interviews and structured lectures to the community leaders. Awareness regarding cardiovascular diseases risk factors and their role in the genesis of stroke diabetes and heart attack was increased at above activities. In the short term awareness was enhanced and significant reduction in the consumption of saturated fats and substitution of saturated with unsaturated oils and reduction of salt in the diet in the intervention group. Risk factors such as blood Pressure, Body Mass Index (BMI) or blood sugar showed no change but serum cholesterol in intervention group showed decrease, which however was not significant[13].

Table-I: Changes in risk factors from baseline to screen111.

Variables		Control Mean ± S.D	Intervention Mean ± S.D	Difference	% Difference	*p*-value
Body Mass Index (kg/m2)	Baseline	23.7 ± 5.4	24.4 ± 7.5	0.7	2.95	0.288
	Re-Screen	25.9 ± 4.9	27.4 ± 7.5	1.5	5.79	0.019
Systolic Blood Pressure (mmHg)	Baseline	118.7 ± 17.8	118.3 ± 16.0	0.4	0.33	0.814
	Re-Screen	124.2 ± 18.4	127.0 ± 19.0	2.8	2.25	0.138
Diastolic Blood Pressure (mmHg	Baseline	79.0 ± 11.3	77.1 ± 11.1	1.9	2.40	0.093
	Re-Screen	82.0 ± 12.3	82.2 ± 12.5	0.2	0.24	0.873
Total Cholesterol (mg/dl)	Baseline	174.3 ± 43.3	166.6 ± 40.9	7.7	4.41	0.070
	Re-Screen	182.2 ± 42.6	174.9 ± 39.7	7.3	4.00	0.079

No significant change was observed in blood pressure and cholesterol $p>0.05$*

Table-II: Exercise evaluation in men and women in screen 111 compared to Base line.

	Responder % Men Base line Screen 111	Times mean	Women	Responder % women Base line Screen 3	Times mean
Run/swim/exercise/m	76 41	5.3 2.1	-	74 12	0.5 1.4
Play hockey, football/m	54 11.7	1.2 3.4	-	76 3.1	0.97 0.72
Play Games/;m	51 12.9	0.21 0.0	-	77 3	0.32 2.5
Flight of stairs/d	92 94	11 14	-	99 87.5	7 10
Shoping trips /w	92 87	5.2 4.4	-	98 69	4 2.4

Abbreviations m = monthly, d = daily , w =weekly*

RESULTS

After five years of intervention and continued contact with households, 44.2 percent of the original 398 households completed the final screen, which showed significant awareness of risk factors. The awareness of healthy food was tangible and the role of saturated oils and organic

fats in genesis of heart disease was high (fig-1) and significant decrease in current smokers in intervention group (fig-2) and some reduction of serum cholesterol. The BMI increased and resulted in higher prevalence of hypertension in women (fig-3). Serum cholesterol showed decrease, which was not significant (table-I). The physical activities at the end of 5 years of study did not improve but by enlarge population in both groups remained sedentary the main activities were walking stairs and weekly trips for shopping (table-II). Compared to base line, the heart attack or stroke did not change, the overall hypertension prevalence remained same as at baseline however in women the rate increased. In spite of sustained efforts a community center in the community could not be established.

DISCUSSION

MHS was a landmark study, which demonstrated that the primary intervention can be implemented in a LMCUC with limited education, low middle class economy and without health delivery infrastructure. It showed that in a conservative community one can access the household kitchens and interaction with the cooks. It demonstrated the diet can be modified in spite of strong cultural bias. Awareness regarding risk factors and their role in the genesis of heart attack and stroke Statistically significant impact on prevalence of smoking in men was demonstrated while decrease in serum cholesterol was statistically not significant. Non-adherence levels increased to more than half of the participants.

In spite of efforts to establish a community center in the community this could not be accomplished. In communities where health delivery systems are not in place, continued engagement with community is intermittent or absent for long periods. The community centers were Institutes responsible for the community manned by residents and community social workers would serve educating the community and provide primary care. Constant engagement is essential for developing the will to change. In MHS the will to change was inculcated by explaining the reason of high mortality due to heart attack and stroke was the high prevalence of risk factors such as hypertension obesity and cooking food with Ghee. After multiple meetings with elders and religious leaders, lectures and health camps we were able to access the household cooks[20]. MHS made serious unsuccessful effort to establish a community center which could have been used for sustained intervention and interaction with the community. The community centers run by the community would have been so useful.

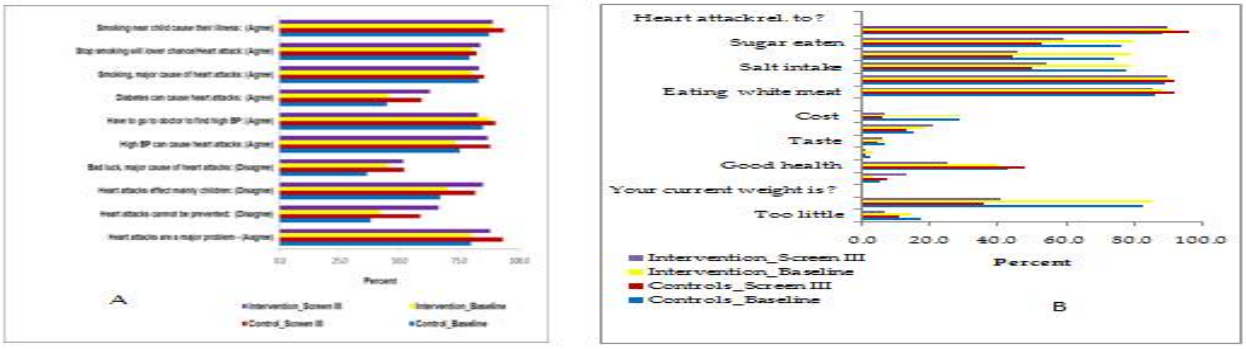

Figure-1(A): Knowledge about Heart attack in Adults (≥18 years) in base line control and intervention and screen 111 control and intervention groups. Figure-1(B): Knowledge about Heart attack in Adults (≥18 years) in controls and intervention

The phenomenon of non-adherence has been noted in lower income communities even in the developed countries. MHS showed 60 percent non-adherence, the reason was lack of sustained interaction with the community. In order to solve this problem the studies undertaken in the poor

communities developed coalitions from among the poor communities in the state of Missouri in USA, who were willing to change. These coalitions determined their own priorities of intervention, successful out come was shown in coalition of the willing compared to controls those who were not willing for interventions thus obviating the risk of non adherence[7].

The imperative of unplanned urbanization haunts Pakistan so that lower middle class slums surrounded by affluent communities and a unhealthy economic balance between rich employers and household workers provided by urban slums, have created an economic balance

Cultural practices and beliefs have profound influence on the will to change. The MHS showed that fate was attributed to heart and not to what they ate, smoked and physical inactivity. Women culturally are confined to home, a major cause of physical inactivity as MHS has shown. The

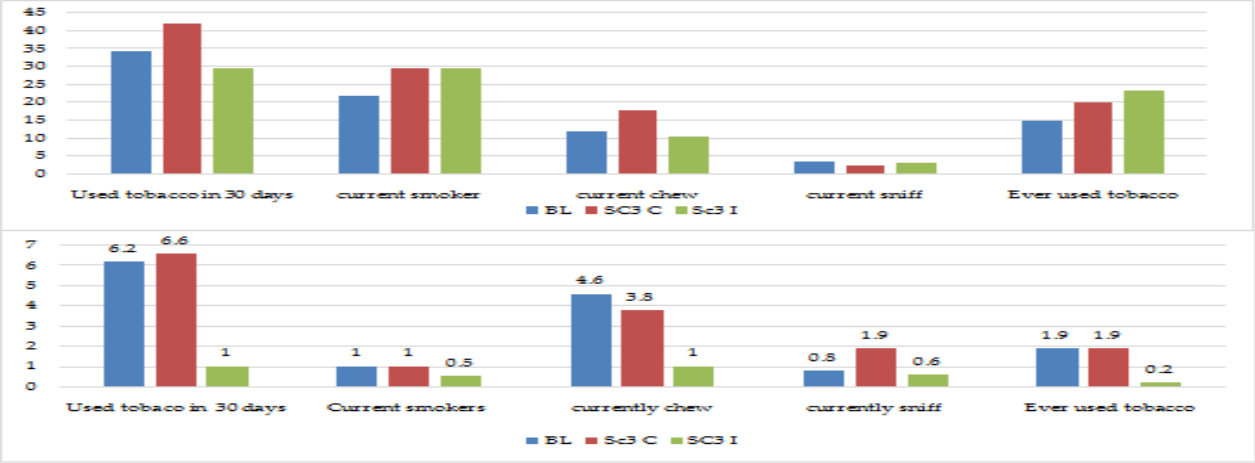

Figure-2(A): Smoking profile in Men at base line (blue) and screen 3 control (red) and intervention (Grey). The smoking rate though decreased in screen 3 intervention group compared to control was not significant, *p*<0.07. Figure-2(B): Tobacco use in women at base line and screen 3 control and intervention groups.

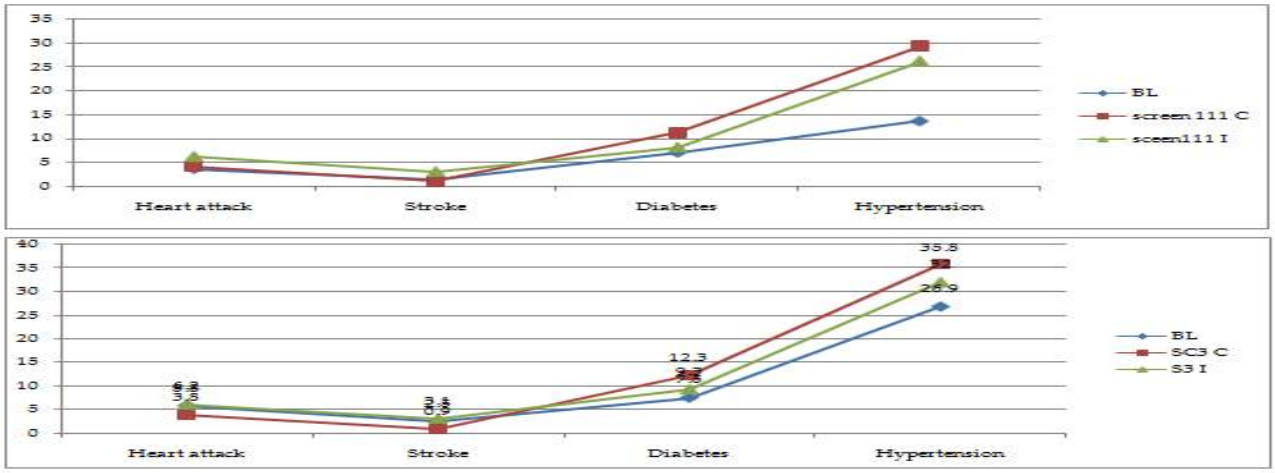

Figure-3(A): Morbidities in men Base line (blue) and control (red) and intervention group (green) screen111. Hypertension rates were significantly higher in screen 3 intervention and control groups compared to the base line rates *p*<0.001. Figure-3 (B): Morbidities in women at base line and screen 3 control and intervention, no significant difference was observed in scree3 control and intervention groups as compared to the baseline *p* = 0.144.

communities, with significant prevalence of risk factors, are increasing at an alarming rate. Urban people in Pakistan traditionally think that disease management is pills and concept that diseases

can be prevented is not in psyche. Most however do believe as in Unani medicine which teaches that certain foods are cold (thandi) and certain hot and that causes disease. One could use such a lexicon to define foods associated with CVD. One needs to find how a conviction that risk factor modification shall prevent heart attack and other CVD can be inculcated within the cultural lexicon.

Poverty did impact MHS and made prevention difficult to achieve. A study was conducted in poor communities of Birmingham Alabama USA, housing state, a low income and targeted physical activities. There was no significant improvement in physical activities and considerable difficulties in obtaining participation.

Japanese and Chinese food is mostly rice based with soya sauce and sea food while Mediterranean food is based on olive oil and herbs, both these cultures had low prevalence of coronary heart disease till recently when wheat and fast food was introduced with significant increase in coronary heart diseases. The food in Pakistan and India is based on saturated fat lentils rice and wheat and high salt content resulting in high prevalence of risk factors and coronary heart disease. The food industry is in infancy, thus open choices determine what people like. Puppet shows dramatizing that diet is responsible for heart attack and stroke and hypertension may affect food choices.

CONCLUSION

MHS was a pivotal study and showed the method of interaction with the community even the households. Its model of interaction with the community is as valid today as when it was applied. The households, elders and religious leaders were interacted with so that diet could be successfully modified. For the sustained risk factor reduction 5-10 year period is required and for significant reduction in mortality and morbidities as long as 20 year period is required (Karelia). In spite of the difficulties, which are a part and parcel of LMVUC in Pakistan, we believe that the prerequisite of sustained effort by the community can be ensured by physical presence in the community. The pivotal role of a permanent establishment of a community center is emphasized where education regarding healthy diet, risk factor modification and life style changes can be taught. The sustained long term interaction with the community would build the will of the community to change.

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CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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