Chapter 6

CHRONIC NCD STRATEGIES & PROGRAMMES

Key Messages

- Surveillance, management and prevention are the three components to achieve the objectives of the WHO Global Strategy for the prevention and control of NCD.
- In May 2004, the 57th World Health Assembly endorsed the WHO Global Strategy on Diet, Physical Activity and Health.
- Various interventions using school children, young adults, pregnant women etc have been done to promote healthy diet and physical activity.
- Tobacco consumption is currently the single leading preventable cause of death. ADIC and Mel Medura are two non governmental organizations who use various strategies to fight against tobacco and alcohol.
- Mental health is an essential component of a healthy lifestyle.

6.1 WHO GLOBAL STRATEGY FOR THE PREVENTION AND CONTROL OF NCD

The three objectives of the strategy are:

- To map the emerging epidemics of NCDs and to analyze the social, economic, behavioural and political determinants of the diseases with particular reference to poor and disadvantaged populations, in order to provide guidance for policy, legislative and financial measures related to the development of an environment supportive of control;
- To reduce the exposure of individuals and populations to the major determinants of NCDs and to prevent the emergence of preventable common risk factors, namely tobacco consumption, unhealthy diet and physical inactivity;
- To strengthen health care for people with NCDs by supporting health sector reform cost-effective interventions, with emphasis on primary healthcare.

To achieve the objectives, the three components are surveillance, management and prevention. Management refers to healthcare innovations and health sector management that address priority needs, provision of cost-effective and equitable interventions for the management of common NCDs. Prevention is the most important component of reducing the burden of premature mortality and disability due to such diseases.

The vast body of knowledge and experience about prevention provides several lessons.

- ***One***, NCDs are to a great extent preventable and the advance is reversible through interventions against the major risk factors and their environmental, economic, social and behavioural determinants in the population. Globally, the most prominent NCDs are cardio-vascular disease, cancer, chronic obstructive pulmonary disease and diabetes. The most common preventable risk factors related to lifestyle are tobacco use, unhealthy diet and physical inactivity.
- ***Two***, interventions against the risk factors need to be integrated at levels of family and community because the causal risk factors are deeply entrenched in the social and cultural framework of the society. Continual surveillance of levels and patterns of risk factors is required for planning and evaluation of these preventive activities.
- ***Three,*** a comprehensive long-term strategy must include the triad of prevention of emergence of risk factors, reduction of exposure to established risk factors and lowering risks of individuals presenting clinical signs of NCDs. Even when implemented together, the last two elements do not achieve the full potential for prevention.

- ***Four,*** a comprehensive prevention strategy must be aimed at reducing risk factor levels among the population as a whole on one hand and high-risk individuals on the other.
- ***Five,*** review of risk-factor intervention studies has demonstrated that to achieve major changes in risk factor levels and disease outcomes, intervention should be delivered at an adequate dose and sustained over extended periods of time. However, even modest changes in risk factor levels will have a substantial public health benefit.
- ***Six***, the success of community-based interventions requires community participation, supportive policy decisions, intersectoral action, appropriate legislation, healthcare reforms, and collaboration with NGOs, industry and the private sector. More health gains in terms of prevention are achieved by influencing public policies in the areas of trade, food and pharmaceutical production, agriculture, urban development, and taxation policies, than by changes in health policy alone.
- ***Seven,*** the long-term needs of people with NCDs are rarely dealt successfully by the present organizational and financial arrangements of health care. Hence, there is a need to address these challenges within the context of overall health system reform.

6.2 PROMOTING HEALTHY DIET & PHYSICAL ACTIVITIES

An article published in the journal of the American Medical Association discussed about a study done to assess the relationship between the death rates of both the males and females and the level of fitness. According to it males and females with low fitness levels have significantly higher death rates than the ones with high fitness levels **(Figure 6- 1).**

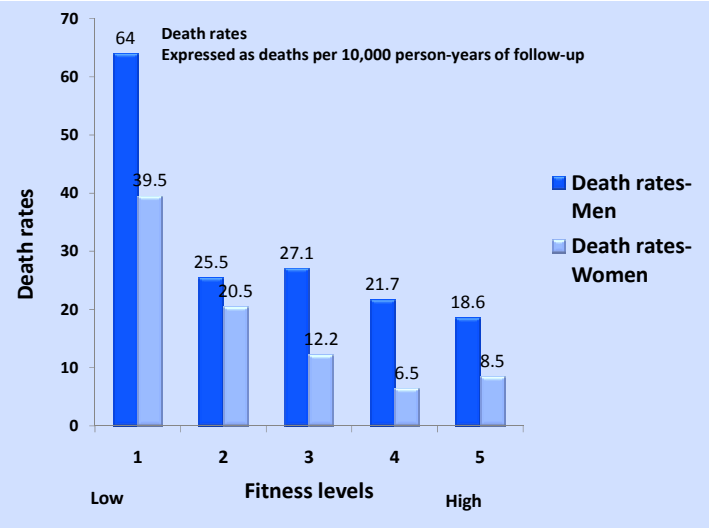

FIGURE 6- 1: THE REWARD OF FITNESS[1]

6.2.1 GLOBAL STRATEGY ON DIET, PHYSICAL ACTIVITIES AND HEALTH

In May 2004, the 57th World Health Assembly endorsed the WHO Global Strategy on Diet, Physical Activity and Health. The overall goal of the global strategy is to promote and protect health by guiding the development of an enabling environment for sustainable actions at individual, community, national and global levels that, when taken together, will lead to reduced disease and death rates related to unhealthy diet and physical inactivity[2].
The four main objectives of the Global Strategy are:

- To reduce the risk factors for non-communicable diseases that stem from unhealthy diets and physical inactivity by means of essential public health action and health-promoting and disease preventing measures;
- To increase the overall awareness and understanding of the influences of diet and physical activity on health and of the positive impact of preventive interventions;
- To encourage the development, strengthening and implementation of global, regional, national and community policies and action plans to improve diets and increase physical

[1]Dean Ornish: Program for reversing heart disease
[2]WHO, Global Strategy on Diet, Physical Activity and Health, 2006

activity that are sustainable, comprehensive, and actively engage all sectors, including civil society, the private sector and the media; and

- To monitor scientific data and key influences on diet and physical activity; to support research in a broad spectrum of relevant areas, including evaluation of interventions; and to strengthen the human resources needed in this domain to enhance and sustain health.

To achieve these objectives, national strategies, policies and action plans should be supported by effective legislation, appropriate infrastructure, implementation programmes, adequate funding, monitoring and evaluation, and continuing research. At present, the activities on diet and physical activity are done in a piecemeal pattern. There is an urgent need for all stakeholders to formulate a national action plan that will contribute to major and sustained improvements in people's health.

Global Strategy Recommendations on Diet:

- Achieve energy balance & a healthy weight
- Limit energy intake from total fats, shift to unsaturated fats & eliminate trans-fatty acids
- Increase consumption of fruits, vegetables, legume, whole grains & nuts
- Limit free sugar
- Limit salt

Based on reports of international and national experts and reviews of current scientific evidence, the Global Strategy recommends specific goals for nutrient intake and physical activity in order to prevent major NCDs that account for the local situation. For diet, the recommendations for populations and individuals include the following: achieve energy balance and a healthy weight; limit energy intake from total fats and shift fat consumption from saturated fats to unsaturated fats and towards the elimination of trans-fatty acids; increase consumption of fruits and vegetables, legumes, whole grains and nuts; limit the intake of free sugars; limit salt (sodium) consumption from all sources and ensure that salt is iodized.

Global Strategy Recommendations on Physical Activity:

- Maintain adequate levels of physical activity throughout life
- Different health outcomes require different types & amounts of physical activity

For physical activity, it is recommended that individuals engage in adequate levels throughout their lives. Different types and amounts of physical activity are required for different health outcomes: at least 30 minutes of regular, moderate-intensity physical activity on most days reduces the risk of CVD and diabetes, colon cancer and breast cancer. Muscle strengthening and balance training can reduce falls and increase functional status among older adults. More activity may be required for weight control.

6.2.2 INTERVENTION WITH SCHOOL CHILDREN AND SCHOOL CANTEEN POLICY[1]

Apart from offering a comprehensive learning environment, schools could be a centre for learning basic health concepts and acquiring healthy habits. As a place where hundreds or even thousands of children gather at once for 5 days a week, schools provide an effective mode to carry promotional campaigns and various other activities. The school-going population in Sri Lanka consists of 3.9 million children, which is approximately 20% of the population. More than half of them are adolescents falling into the age groups of 10-19 years. Half (53%) of the 9,826 schools have more than 200 children. Below are some of the programmes and a policy that directly or indirectly contribute to promoting healthy diet and physical activity among school children.

A. SCHOOL HEALTH PROGRAMME

The School Health Programme (SHP) was started to ensure that children are healthy and capable enough to promote their own health as well as that of the family and community along with reaping optimal benefits from educational opportunities. It was started on a very small scale in 1918 with just one medical officer and grew over the years giving rise to 270 health units by the year 2005. The integration of the programme with the health unit system in 1926 and the expansion of school health work to other areas in 1935 were some of the stepping stones of this programme. It was further enhanced when school health was incorporated into the family health programme in 1980.

The SHP consists of 5 components that consider the multiple needs and demands of school children: health-related practices; school medical services (including counseling which provides the opportunity for the child to come out with issues that he or she is facing); healthy school environment; life skills-based health education; and school community participation. It improves the children's' capabilities to understand health concepts and guides them in putting it all to practice.

One of the main strategies of the School Health Programme is to strengthen the partnership between the Ministry of Education and the MoH. This partnership is further strengthened by the participation of NGOs and various other organizations. The basic idea has been to create a functioning unit with the participation of various bodies in order to ensure the final result.

B. HEALTH PROMOTING SCHOOL

A pilot project on Health Promoting Schools was carried out at Royal College, Colombo. Its main objectives were advocacy to parents, teacher motivation, parent participation, creating supportive environment and knowledge transfer about the concept of health promotion. Through the pilot project, the common nutritional problems of school children were discussed. A health promoting "Community Advisory Committee" was established to ensure the

[1]Rajarathna R (Head/ School Health Unit), 28 July 2006

sustainability of the activities. This committee has already started a "kolakenda programme" that put up posters promoting healthy foods, and introduced green gram and red rice in place of fast foods.

C. SCHOOL-BASED PHYSICAL TRAINING AND OTHER ACTIVITIES

A physical activity programme has been integrated into the curriculum of 200 pilot schools and will be implemented island wide in 2007. For the upper grades, the programme allocates 3 periods per week to health and physical and physical education as well as to physical activities. Additional 15 minutes of music with physical activity is included in the programme for upper schools. Nationwide implementation of this programme will face a major challenge – there are only 2,000 Physical Training teachers in the country for the 9,086 schools. Also, it needs to allocate more time for physical training so that the children can take part in a moderate physical activity at least 30 minutes per day.

D. MID-DAY MEAL PROGRAMME

The school Mid-Day Meal Programme was launched in January 2006 to improve the nutritional status of children so that the incidence of malnutrition could be brought down. It inculcates good eating practices, promotes healthy food choices and other health habits. It also supports the education objectives as better attendance of school children has been noticed. At present, the Mid-Day Meal Programme is being implemented in 6,075 schools. The MOH are responsible for the safety and quality of the food while the PHI coordinates the entire programme.

E. SCHOOL CANTEEN POLICY

The school canteen policy was formulated with the aim of optimizing the educational performance and overall development of the school children by improving their nutritional status and promoting healthy dietary habits. This policy focuses on health issues which prevail among children such as under-nutrition, over-nutrition and oral health problems. It highlights the importance of the food delivery services in the school premises to be child-friendly so that nutritious, safe and good quality food in the school premises will be available. If not properly guided and regularly monitored, the school canteens could be an agent causing both acute and chronic health problems.

6.2.3 PROGRAMMES/PROJECTS WITH YOUNG ADULTS[1]

A diet and physical activity programme was initiated at the Sri Lanka Air Force that targets young adults who are or with a risk of being overweight. Its main goal is to reduce the NCDs by changing the lifestyle of young adults. Its specific behavioural objectives are for the participants to engage in exercises so as to convert the sedentary life style into an active one, and to

[1] Dr.Nanayakkara, 28 July 2006

change food habits into healthy and nourishing ones. As such, there was a need to:

- Change the behaviour of the risk group
- Sustain the behaviour of the healthy group; and
- To provide an enabling environment through community/ social mobilization.

After an energetic team of determined professionals was organised to launch the programme, several activities were undertaken:

- Advocacy – so the leadership will mobilise resources;
- Awareness programmes – for the participants to realize that their present attitudes keep them away from participating in exercises and eating healthy and, consequently, is worsening their health conditions;
- Skill development – on the various kinds of exercises;
- Change & development of behaviour – of those who are at a risk;
- Social/ Community mobilization – to make healthy eating habits and physical exercises trendy, a vogue, an "in thing" so as to encourage broader participation among young people; to create a value for these habits; to promote the idea that these habits are basic needs and are the most important investment they could make on their health; and
- Policy changes – to provide an enabling environment. Including facilities

To sustain the benefits of the ongoing programme, there is a need for a review process, for additional trainers, for expansion in target coverage, for a refresher course, and practical sessions on individual counselling that can complement the existing awareness programmes.

Young Executives' and Ladies' Perceptions of Obese People:

- Incompetent
- Poor time managers
- Unable to take decisions
- Not smart
- Not good looking
- Unattractive

6.2.4 PROGRAMMES/PROJECTS WITH ELDERLY[1]

The Directorate of the YEDD initiated a programme entitled "Promotion of Active Ageing" to improve the health of elders in the communities and to ensure that they are well enough to carry out their daily activities. Along with age, movement is compromised and elderly patients are seen to be complaining most of the time of stiffness, aches and pains in the joints and bones etc. Debilitating illnesses make the elderly less independent. Since its inception in 2000, the programme has expanded and is now being implemented in 252 MOH areas.

Aside from training of the MOH and staff, the programme includes training of volunteers in MOH areas for care of elderly, establishment of day centres, promotion of healthy ageing in MOH areas with government initiatives and supported by community and NGOs, and mobile baseline assessment clinics for early detection of NCD. The day centres are encouraged to provide healthy meals, physical exercise programme, and recreational facilities.

[1]Perera, 28 July 2006

The exercise programme for the promotion of health in old age are aimed at improving flexibility, agility, muscle strength, balance, endurance, coordination, and resistance training **(Table 6- 1).** Some of the trained MOHs believed that the exercises were simple, easy to do and could be used by them to teach their elderly patients.

TABLE 6- 1: EXAMPLES & OBJECTIVES OF EXERCISE

Objectives	Exercises
To increase flexibility	Holding the head with one hand then flexing the head sideways
	Touching the toes with ones hands
	Bending sideways while raising the hand over the head
	Bending sideways while lifting a rod
Aerobic training session	Speed walking
To improve muscle strength	Walking on all fours
	Pulling the knee up to the chest

Volunteers play an important role in running the day centres. They are trained to carry out various responsibilities such as to be in charge of the place, to conduct exercise programmes, and to prepare healthy and balanced meals. The meals are prepared to meet the nutritional demands of old age.

"MRI Promoting Healthy Eating and Life Style Habits"

"The Nutrition Department, which is a part of the MRI, was set up in 1952 to carry out research and investigations on the nutritional aspects of health in Sri Lanka. It is mainly responsible for monitoring the levels of iodine, vitamin A and iron among specific population groups. Also they are involved in monitoring protein malnutrition levels and are responsible for food analysis. The MRI plays an important role in carrying out research linked to NCD. At present they are advocating the 'once-use' of coconut oil for cooking which has been proved to reduce cardiac problems that may arise as a result of using the same oil repeatedly for frying. Dr C. Piyasena, who has been working for the MRI for a number of years, has been involved in developing dietary guidelines in Sri Lanka and has given her inputs in drafting the national nutrition policy which has promoted rice-based products and traditional Sri Lankan diet. She has also advocated the labelling of genetically-modified food products. MRI has sought the support of media to promote correct food habits and the importance of life style changes. MRI provides training on nutrition for its staff and also for primary health care personnel. Postgraduates and undergraduates are also trained on the new guidelines...."

- See Annexure 1 for the full text of the case study

Aside from the programme on "Promotion of Active Ageing", the Directorate of Youth, Elderly and People with Disability also conducts a "Pre-Retirement Awareness Programme" to tackle the issues that could crop up after retirement, to offer solutions to the concerned party and to promote healthy post-retirement life style. This programme has activities

on physical exercise, fall/accident prevention, healthy diet, adequate sleep, regular medical checkups and safe drug use. Through these productive activities, the psychological well-being of elderly is improved.

Although these programmes have been successfully launched, the following constraints have to be addressed: lack of staff at central level; lack of infrastructure for accommodating more staff at central level; and no identified cadre to specifically implement and monitor the activities in the peripheral areas.

6.2.5 PHYSICAL EXERCISE WITH PREGNANT WOMEN[1]

The CSHW regularly conducts a physical activity programme for pregnant women. The programme is held on Saturdays from 8 am to 1 pm for both the parents (about 200-250 participants)) at the hospital auditorium. The facilitators include consultant VOG, SR, SHO, ward sister, and members of the health education unit. On days of antenatal clinics, the exercise programme is conducted by trained nursing officer and midwife from the health education unit.

5 Parts of the Programme for Pregnant Women at the CSHW:

- Introduction about hospital facilities and benefits from the programme
- Importance of achieving the ideal weight gain during pregnancy
- Facts and fallacies about exercise and nutrition during pregnancy
- Antenatal and post natal exercises
- Mental preparations

About 20 mothers are accommodated in a group and the exercises are demonstrated and the mothers are given practical training.

The programme for pregnant women is composed of 5 parts. The first part is an introduction to the hospital highlighting the facilities available and the benefits of attending workshops of this nature.

The second part of the programme emphasizes the importance of proper diet and achieving the ideal weight gain of 12 kg/term, and being over- or underweight could have negative impact on both the baby and the mother. Being overweight leads to complications such as backaches and leg pain, tiredness, varicose veins, gestational diabetes, high blood pressure, ischemic heart disease and syndrome X. In addition, being overweight makes natural delivery difficult, thus, increases the chance of caesarean delivery.

Another part of the workshop is aimed at clarifying fallacies about pregnancy, diet and exercise. In Sri Lanka, there is a popular belief that a pregnant woman should eat for two and that physical exercise could have fatal effects on the baby. Because of these misconceptions, pregnant women are reluctant to engage in exercise on the one hand and, on the other hand, tend to overeat.

Then, the participants are made knowledgeable about antenatal and postnatal exercises as well as ideal level of activity and exercise. The importance of being physically active during pregnancy is emphasized to lessen the complications due to overweight as previously mentioned.

The mother has to be physically and mentally prepared for the delivery of the baby and the events that follow afterwards. Henceforth an insight to delivery, postnatal care, neonatal care and breast feeding is given to the

[1]Liyanage, 28 July 2006

parents. Family planning ensures that children get the best of facilities and enough attention needed for their proper growth and wellbeing. Also the number of children that a couple could have based on their income and facilities too determine the health and wellbeing of their children. This is also highlighted during the programme.
Parents who attend these workshops are at liberty to put forth their questions to the professionals who try their best to answer each of them in the best possible way.
The programme has several noted constraints. For one, the parents seem to be less interested in the physical exercise programme and they are more interested in other services such as consultations, scans and other tests. Mothers are not motivated to participate because they are less aware of the importance of physical activity. Sri Lankan women are believed to be less concerned over their shape/figure/looks. Space is another major limiting factor. At the CSHW, there are over 200 mothers per day at clinics and only 20 mothers can be accommodated in a group. The awareness of healthcare workers needs to be enhanced as well; there is a need for more trained staff. Maternal exercise programmes are not commonly seen in Sri Lanka due to monetary constraints.
Some of the recommendations, therefore, include programmes to heighten the health care workers' awareness, to train some staff, and to provide facilities that reach the rural population. In upgrading maternal and child health, the Sri Lankan health care system needs more trained staff and facilities that would reach out to the rural population. Above all, there is a need to develop a national programme that will create awareness and change the attitudes of parents regarding healthy diet and physical activity for pregnant women.

6.2.6 HEALTH PROMOTION IN KALUTARA

- **Region** **:** Two MOH areas from Kalutara
- **Population** **:** 3500 people
- **Duration** : 6 months
- **Target groups:** Housewives and children

The program was initiated with home visits to the two MOH areas. The midwives of the areas introduced her to the villagers and it was a successful initiation to the program as they are more close to the community. First she got friendly with the people and then the objectives of her program were introduced. Then a health baseline assessment campaign was done. The height, weight and the blood pressure measurements were taken from each individual and then the BMI was calculated. At the same time a description of meal times, quantity and quality of the meals and the sleeping time etc. were taken from each housewife. Villagers in the age group of 25-50 with the BMI values above 25 were taken as the risk group. The identified risk group was informed to be present to the clinic and the next follow ups were done at the clinic as it was easier.
The next step done was to educate the risk group on preventive aspects. The session was started by making introductions of each other to make the atmosphere friendlier. Four such sessions were held. Mainly four important

topics were introduced: **Nutrition, Exercise, Relaxed mind** and the **bad effects of NCD**. Several key massages were given on every aspect.

- Nutrition
  - Need to take regular, nutritious meals in adequate amounts.
    The meaning of a nutritious meal was taught to the women. The need of reducing certain types of food was described. The exact amount of each of these foods that is adequate enough for the person was told.
  - Need to take the meals on time.
    Morning meal is very important for good health. Early morning breakfast will regularize the timing of the lunch and the dinner. Avoid drinking milk before the breakfast.
  - Do not sleep within 2 hours of the lunch.

Did not say to not to eat as it is very difficult to make people do it. More compliance can be expected by not saying to avoid, but asking to reduce the amount.
It was emphasized the fact that if the person really need to, it is very easy to change their food habits.

- Exercises
  - Need regular exercise to maintain good health.
    Walking is the most effective way of exercising. A walkathon was arranged to be held on next month. The idea was to make them aware how easy it is to, how people can make it an enjoyable regular event of their life style with a group of people. This way it will make people more enthusiastic walking in a group is very relaxing and they can have their relationships improved.
- Relaxed mind
  - Relaxed mind is a key to have a healthy life.
    It does not take much effort to relax. If the family members can get together at a certain time specially at night and have a friendly conversation with each other about their day it will ultimately help to improve their mental health.
  - Relaxation techniques
    Fun games and certain exercises that can be done sitting as a group were introduced to them at sessions. These were asked to practice at home with each other. People were moderated to think and talk, listen and actively involve in activities.

- Bad impact of NCD
  - Even though they are disease free today they can be a victim tomorrow, if they do not focus on preventive aspects now before it is late.
  - The risk factors (genetics, family history, obesity, food habits and sedentary life style) were introduced to them as they were unaware.

She did not try to make them develop fear, but to make them aware.
Certain specific aspects were focused on different groups of people other than the general messages.

- For the Montessori children

  The teachers and the parents were educated to stop the milk before breakfast. Their breakfast was asked to be provided at home instead of the morning milk. Then At about 10.00 a.m. a drink was given. The lunch was to be prepared in the Montessori and provided for them. This was done to regularize meals.

- For pregnant mothers

  Importance of early breastfeeding was introduced. During the weaning period specific things were introduced to be considered. The child should be given nutritious meal from the beginning. Meals must be given on a table and the mother must eat with the child. The meal should be an enjoyable event to both parties.

- How to measure the progression?

  Serial BMI measurements are going to be used for the evaluation of success. Subjective and quantitative questions will be asked to assess the improvement.

A. PROBLEMS ENCOUNTERED

From the beginning the nurses and the midwives were reluctant to get involved in home visits as it increase their workload. To overcome it the home visits were done when they were free and the follow up was done at the clinics. Some staff members did not like visits. So they were not involved. They were used for the clinic work only.
She has tried to change the meal time of school children. But as they have set meal times in school, principals have rejected to change it.
Males were not involved as she believed they are difficult to change and it is difficult to expect their corporation as they are working.
Need a special person to carry out this work until people are really changed and these become part of their routine. The Montessori and the midwives are changed. But the procedure won't sustain in the community without a special person to look at it.

B. LESSONS LEARNT

- Behaviour change should be started at the youngest age possible for better success.
- It is not easy to change people as it takes a lot of time to change their set behaviours.
- Being friendlier with the community enhances the chances of success in community based work. When addressing the issues related to the villagers it is important to get the involvement of the midwives or the public health nurses as they are closer to the community and they are involved in the work already.

- It is difficult to change some people and the working mothers are also reluctant to change due to their attitudes as well as their time restraints.
- Even though to change the life style different stake holders need to be addressed, it is possible to change it by addressing one or two parties as well initially without going for large scale issues.
- It is believed that she has succeeded in changing some of the people. She is sure about the change in the Montessori and the midwives attitudes. She thinks that by educating can help people change even without using high standard techniques if you have the initiative.
- It is very difficult to change those above the age of 45 years. Still she believes by education they can be made aware at least.
- Community should be made aware of the preventive aspects of the NCD similarly as in Dengue programs.

c. FUTURE

Hope to involve the other 35 midwives in the district to improve the community involvement and also to spread the messages.
From next month half an hour is given in the monthly meeting of the MOHs to address the issue on healthy life style.

6.3 REDUCING THE USE OF TOBACCO AND ALCOHOL

6.3.1 WHO FRAMEWORK CONVENTION ON TOBACCO CONTROL

Objectives of the WHO Framework Convention on Tobacco Control (FCTC):

- To protect present and future generations from devastating health, social, environmental and economic consequences of tobacco consumption and exposure
- To provide a framework for tobacco control measures that will be implemented by national, regional, and international level

Tobacco consumption is currently the single leading preventable cause of death, which results in the premature death of nearly five million people a year. If current smoking patterns continue, the number of deaths will double to 10 million a year by 2020. The WHO FCTC is an international treaty which was adopted in May 2003 by the 56th World Health Assembly. It has 168 signatories, including the European Community, which makes it the most widely embraced treaties in UN history. It is the first treaty negotiated under the auspices of the World Health Organization and the first legal instrument designed to reduce tobacco-related deaths and disease around the world. It is an evidence-based treaty which reaffirms the rights of all people to the highest standard of health.

The document on the FCTC described the following[1]: objectives, guidelines and general obligations; measures relating to the reduction of demand for tobacco; measures related to reduction of the supply of tobacco; protection of the environment; questions related to liabilities; scientific and technical cooperation and communication of information; and institutional arrangements and financial resources. The FCTC has provisions that set international standards and guidelines for tobacco control in the following areas: tobacco price and tax increases, sales to and by minors, tobacco advertising and sponsorship, labeling, illicit trade and second-hand smoke.

6.3.2 NATIONAL LEGISLATIONS ON ALCOHOL AND TOBACCO

There are two main factors that contribute to the consumption levels of alcohol. These are the retail availability and the demand for the substance. These two factors interact with each other. The overall goal will be to regulate the level of consumption, which is influenced by the retail availability on one hand and the demand for the substance on the other[2]. These two factors interact with each other. To effectively reduce the consumption, policies must be able to:

- Reduce access and availability;
- Reduce affordability by increasing prince;
- Restrict the advertising and promotions; and
- Enforce special measures directed at a specific group of individuals or situations (e.g. drunk driving).

[1]Tissera, 14 August 2006

[2]Dr.Nanayakkara, 28 July 2006

Legislations governing the use of alcohol and tobacco in Sri Lanka abound. Below are some of them.

- Excise Ordinance No 8 of **1912**

  At the inception, primary objective was to collect revenue from the subjects, rather than to curb offences detrimental to the society. The offences were in the areas of possession and transport; manufacturing; illicit tapping; sale of arrack, unlawfully distilled spirit) or toddy; and illegal transport or import. Section 46 of the ordinance stated that "Whoever in contravention of this ordinance or of any rule, or order under this ordinance, or of any license, permit or pass, obtained under this ordinance: Imports, exports, transports, or posses any excisable article; or Manufactures any excisable article; or Taps any toddy- producing tree, or draws toddy from any tree; or Establishes or works any distillery, brewery, or warehouse; or Uses, keeps, or has in his possession any materials, utensil, implement, or apparatus whatsoever for the purpose of manufacturing any excisable article other than toddy; or Sells or keeps or exposes for sale any excisable article; or Bottles any liquor of purpose of sale, shall be guilty of an offence."

- Children and young persons Act 2/**1978** Sec 76

  Sale of tobacco to persons under sixteen is prohibited; the Commissioner of Internal Trade can direct manufacturers regarding the health warning in the pack. (Earlier Consumer Protection Act)

- Act No 41 of **1979** Sec. 02 (Offences committed under the influence of liquor - special provision)

  Any person who being under the influence of liquor in any public place or in any place or where it is trespass for him to enter and there conducts himself in such a manner as to cause annoyance to any person shall be guilty of an offence. The offences include damage to public property while under the influence of liquor (Sec. 3), giving of liquor to child under 12 years of age (Sec. 4), and sale of liquor to persons under the age of 18 years (Sec. 5).

- Excise (Special provisions) Act No 13 of **1989**, by Sec 3(1)

  Minister can declare excise duty on cigarettes.

  Excise Notification no 781 published in the Gazette Notification (extra Ordinary) 572/6 of 22.8 **1989** empowers to sell (retail), transport and posses 7.5 litres (10 bottles) of arrack. In Sec. 22, the minister with the concurrence of the minister in charge of the subject of finance may, by order published in the Gazette, from time to time impose a duty at such rate or rates, either generally or for any specified local area on any excisable article (Alcohol).

- Gazette no 928/1-**1996**.06.17

  The distance from the sales point to a school or place of workshop must be 100 meters if for selling only, but must be 500 meters if consumption in the same place.

- Tobacco Tax Act 8/**1999**

  An Act to impose a tax on cigarettes cigars, beedies, cigarette substitutes, and pipe tobacco.

- Public Administration Circular No 08/**99**

  Smoking in all state institutions should be prohibited; sale of cigarettes and tobacco based products in canteens of these institutions should be stopped; advertising in any form for the promotion of smoking within state intuitions should be prohibited; and accepting sponsorship by state institutions from those who promote smoking should be prohibited.

- Motor Traffic Act Sec. 151

  No person shall drive any motor vehicle on a highway after he has consumed alcohol or any drug

- Some Acts/ Regulations aimed at protecting the public from exposure to tobacco smoke

  Railways Ordinance No: 9 of **1902**, Transport Board 19/**1978**, Private omnibus services Act 44/**1980**, Sri Lanka Railways Authority Act 60/**1993**

- Regulation No **2004**/21 Ministry of Education

  Using, selling, advertising and promotion of alcohol and tobacco products are prohibited in school premises

- National Authority on Tobacco and Alcohol (2006)

  A landmark legislation that prohibits the sale of any tobacco products or alcohol product to persons under the age of 21 years (Sec. 32); prohibits vending machines (Sec. 33); prohibits the sale of tobacco products without health warnings and tar, nicotine content in each tobacco product (Sec. 35); prohibits tobacco or alcohol advertisements (Sec. 36); prohibits sponsorship and free distribution (Sec. 37); and declared smoking in any area where public have access as an offence (Sec. 40).

The constraints in enforcement are partly attributed to lack of budgetary allocation. There is a need to improve the motivation of the officers and the general public. Some companies make use of certain loopholes in legislation for their promotion campaigns.

6.3.3 STRATEGIES FOR PREVENTION OF TOBACCO AND ALCOHOL USE[1]

Many governments have taken measures to control the increasing trend in the consumption of tobacco and alcohol by issuing license with several regulations, closing liquor outlets on certain Poya days, banning of the sale of alcohol to young people, progressively increasing taxes and bringing in

[1]Samarasinghe, 14 August 2006

regulations on drunk driving. In spite of all of these, the consumption of alcohol and the alcohol-related problems in particular have been on the rise. The hurdles to effective interventions are having unclear ***goals***, the lack of ***models*** to test on, reliance on ineffective methods, and lack of skills for effective interventions. The ***goals*** of an effective intervention may be any of the following:

- Prevention of all types of uses of alcohol and tobacco;
- Prevention of initiating the use or from being initiated or introduced;
- Prevention of dependence;
- Prevention of problematic use; and
- Prevention of hazardous or risky use.

In working out ***models***, one must be clear about the determinants of alcohol and tobacco use and the ways to change them. The image which tags with the consumption of alcohol and tobacco is one that is attractive and impressive. The image of one abstaining from alcohol is portrayed to be weak and unattractive while that of the one who does is glorified. In fact most of the determinants are social. Apart from this the abundant availability and the affordability of these products too promote the usage of these substances. The trade does a great job in promoting these products in every possible way, using every mode possible advertisements, movies, billboards, posters and many other methods are used in their promotional campaigns. Other determinant factors are the influence of the immediate environment, the privileges of use for users and the reduced pressure towards giving up or reducing the use of alcohol and tobacco, incorporation of use in events where it becomes a part of social activities, and the increase of sales points. In addressing the determinants there should be individual-focused efforts as well as local and community efforts in order to bring about national and global changes. The actions should be community driven.

"Tackling Irresponsible Media the ADIC Way"

"One of the main ways of marketing alcohol as well as tobacco is by promoting them in the programme content of movies, tele dramas etc. without going into direct advertising. ADIC a non profit organization which is dedicated to reducing the consumption of Tobacco and Alcohol in the country, has understood clearly the role media plays in controlling as well as promoting the use of alcohol, tobacco and other drugs among young people. Trying to raise awareness on harm caused by these substances among the media personnel was a very practical strategy ADIC has adopted where individuals belonging to all levels of the media field were addressed on the issue. Persistence as well as perseverance of this organization has achieved a significant reduction in smoking and alcohol in the society while the perception of these hazardous substances among the younger generation is beginning to change."

- See Annexure 1 for the full text of the case study

Special attention should be given to pricing and health policy. Increasing taxes or price is rarely perceived as good. The argument being that

increased prices would hurt the poor or that it would increase the sales of illicit or untaxed sales. Yet in terms of tobacco and alcohol the ***increase in taxes would be a step taken towards solving the problem***. Increasing the price of the substances decreases the easy availability as well as the purchasing power of the substance. However, the overemphasis on pricing may promote the illicit trade; as such, intervention models on pricing and health policy should not ignore this.

Measurement of impact of interventions as well as feedback is essential in order to monitor the progress. The problems which have been encountered in assessing the impact arise most of the time because some health professionals are not too familiar with social science outcome and impact assessment. Conducting a double-blind controlled clinical trial involving the use of alcohol and tobacco is a challenge as it poses many operational and ethical issues. Nonetheless, monitoring and evaluation indicators could still be developed and below are some examples vis-à-vis the determinants:

- Image of use - how attractive the smoker looks, as most determinants are social in nature;
- Availability - incorporation of use in events such that it becomes an integral part of social activities such as weddings and funerals;
- Affordability - increased price of substance;
- Promotion by trade - increase of sales points; and
- No pressure to reduce or quit.

Despite the challenges in developing and selecting intervention models, despite the difficulties in assessment, there are many strategies that can be done by paying attention to the simple things to protect the young as well as the old from becoming untimely victims of various diseases and death caused by alcohol and tobacco consumption.

- "Deglamorise" the use of tobacco and alcohol or change the false positive image created by the alcohol and tobacco industry - The subtle yet destructive method behind the idea of fun and fashion as well as the many ill effects of using these products should be brought out to the open.

- Decrease the unfair privileges accorded to those who drink – when a wife rationalizes the violent behaviours of her drunkard husband, then she gives him an unfair privilege. When people in a social event pretend that someone has suddenly developed a sense of humour because of his drunkard state, then they encourage him further to indulge in that habit.

- Re-orient the culture which encourages the taking up of these habits – For the fear of being rejected and for the need of belonging to a group, many get into these habits. Many young people take their first drink or smoke the first cigarette due to peer pressure. Measures are taken to prevent such individuals from indulging in such habits are considered to be a violation of their liberty and enjoyment.

- Increase the price and taxes.

6.3.4 HEALTH PROMOTION TO REDUCE ALCOHOL AND TOBACCO USE: EXPERIENCE OF ADIC[1]

ADIC started its health promotion approach in 1989. The approach requires facilitation of its target group, the young people, to explore the idea that alcohol increases happiness but limits the enjoyment of life. It motivates social drinkers to critically analyze their alcohol use even while drinking by asking questions like "Am I enjoying the alcohol or the other factors attached to the setting such as the friends, the mood, the freedom etc?"
The health promotion approach also asks young people to observe alcohol users' enjoyment of life as well as to compare alcohol or tobacco users' early life with his present life. In the end, the participants perceive alcohol users not as bad people but as people who limit their repertoire. By getting young people to observe alcohol user's minimized chances of enjoyment and opportunities in life, their chances of getting into such habits could be lowered. Young ones sometime form these habits being unaware of the long-term consequences and the only way to make them see and learn is by bringing their focus towards the already affected group of people. When they understand that the many chances of seeking happiness have been limited now because of indulgence in drinking, the craving for these habits would diminish a great deal.

Promotional Activities to Curb Alcohol and Smoking Use

"Effects on physical and mental health caused by consumption of alcohol and smoking are immense. ADIC- Sri Lanka was inaugurated in April 1987 but was established in 1990 as an independent organization. Its aim is to create a reduction in the demand for these substances and they have approached their objectives in two ways. One way is to control promotion of alcohol and smoking in media. The other is by carrying out promotional activities on reduction of smoking and alcohol consumption among public. They are determined to create lasting changes in the community by changing behaviours and therefore they have introduced innovative and scientific based drug demand reduction methods to Sri Lanka and to other countries in the SAARC region. Their vision is to create a world where people realise that using drugs is an impediment to happiness. They have carried out successful promotional campaigns at all levels of the community achieving positive results. Battling tobacco and alcohol industry has not been an easy one but theirs is a story of success. Their efforts have won them the prestigious WHO award, Tobacco or Health medal in 1993 and the Commonwealth Youth Service Award in 1998/99 granted by the Health Secretariat."

The ADIC participants are facilitated to uncover the strategies of the tobacco and alcohol industries that attach alcohol use with all fun activities and positive feelings by, for example, projecting a girl to look more attractive with a glass of wine in her hand while a group of macho men are seen at the bar drinking, laughing and trying to prove that they are having the time of their lives. The young people in the health promotion programme are made aware that the industries try and condition the mind of the non-users to this image of "enjoyment equals the use of alcohol".

[1]Sumanasekara

Through the experience of ADIC, at least three lessons have been learned: always use simple, fun and attractive activities; recruit people who like to enjoy life mobilizing the community; and the approach is not recommended to people with firm convictions.

6.3.5 TREATMENT/REHABILITATION OF ALCOHOL AND TOBACCO USERS: EXPERIENCES OF MEL MEDURA[1]

The objectives of treatment are to prevent premature deaths, to reduce harm, and to overcome problems. Substance- related goals includes abstinence, reduced use / controlled use or continued use with reduced harm. On the other hand, personal growth goals (or quality of life goals) are improving interpersonal relationships, promoting responsible behaviour particularly in the job, acquiring coping skills (handling emotions), money management, time management, and reduced "negative" behaviours.
The available treatment methods are categorised into:

- Drug substitution – the aims of drug substitutions may be to lessen the risks (e.g. contracting or transmitting HIV/AIDS), to minimize the risk of overdoses and other medical complications, to reduce the motivation and need for addicts to commit crimes and keep them out of prisons, to maintain contact with drug users;
- "Psychotherapy" & "counselling" – e.g. cognitive behavioural therapy, relaxation, empathy, bonding;
- Therapeutic community – therapeutic communities are drug-free residential settings that use a hierarchical model with treatment stages that reflect increased levels of personal and social responsibility. They differ from other treatment approaches principally in their use of the community, comprising treatment staff and those in recovery, as key agents of change. This approach is often referred to as "community method." Therapeutic community members interact in structured and unstructured ways to influence attitudes, perceptions, and behaviours associated with drug use.
- Alcoholic anonymous approach.

The Mel Medura Programme has two major programmes – the In House and the Outreach. Through the Day Care activities, Mel Medura helps the users by getting in contact with them and providing them with services such as assessment, diagnosis, detoxification or treatment of withdrawal, therapy, relapse prevention, and maintenance (including follow up & long-term support). Users who exhibit severe withdrawal symptoms are referred. Individual support and group support are extended as part of psychotherapy. The two other In-House Programmes are called "Strengthening the Family Members" and "Poya Day Awareness Programme".
Mel Medura conducts focus group discussions and community outreach interventions as well as supports group formation as part of its Outreach Programmes.

[1]Fernando, 14 August 2006

Mel Medura strives to improve quality through the development and use of manuals and documents, staff training, evaluation and management, and clearly defining implementation mechanisms.

6.4 IMPORTANCE OF MENTAL HEALTH

During the recent past there have been so many discussions going on regarding prevention of non-communicablediseases. Promotion of healthy life styles has been identified as a key step in preventing non-communicablediseases. There has been some doubt about the components of a healthy life style. Even though healthy diet, physical activities, abstinence from alcohol and tobacco have been recognised as the components of the healthy life style there has been some doubt over stress management. But there is adequate amount of evidence to prove that mental health is an important component in healthy life styles.

In Alameda County a study was done using 6928 people living near San Francisco and in the North Karelia Study which was done with the involvement of 13301 men and women living in Eastern Finland participants were studied for five to nine years. Those who were socially isolated had a two to three fold increased risk of death from both heart disease and from all other causes when compared to those who felt most connected to others.

Similar results were found in 2059 subjects from Evans County, Georgia, where the greatest mortality was found in older people with few social ties.

In another study reported by Dr. Ruberman in the New England Journal of Medicine, interviews with 2320 male survivors of heart attacks revealed that patients who were classified as being socially isolated and having a high degree of life stress had more than four times the risk of death from heart disease and from all other causes when compared with men who had and from all other causes when compared with men who had low levels of both stress and isolation.

6.5 IMPORTANCE OF OPPORTUNISTIC SCREENING

Opportunistic screening is to perform screening for a certain condition on people visiting the doctor for other health concerns. It can be easily incorporated into a patient's care and offers advantages, including cost-effectiveness and a better chance for follow-up care.

A research done at the Veterans Affairs Medical Centre in Durham revealed that among 1253 outpatients without recognised diabetes, 4.5% were found to have the diseases. Of these, 61% require a change in treatment for conditions including undesirable blood sugar levels and hypertension.

Another team at the University of Michigan health system studied opportunistic screening in 5752 non diabetic patients $\geq$45 years of age. 4% (202) of those screened had abnormal results. Out of the 202 patients with abnormal results 17% (35) were diagnosed with diabetes within 6 months of screening.

Internet search was done to find out the cost effectiveness of opportunistic screening. In the Pubmed there is only one study has been done regarding NCD to find out the cost effectiveness of opportunistic screening. This study has been done in Hong Kong by Harvard Centre for risk analysis, Harvard school of public health in USA to assess the cost-effectiveness of organized versus opportunistic cervical cytology. Compared with no screening, opportunistic screening using cervical cytology produced a nearly 40 per cent reduction in the lifetime risk of cervical cancer. However, with organized screening every 3, 4 and 5 years, corresponding reductions with conventional cytology were 90.4, 86.8 and 83.2 per cent per cent compared with no screening. For all cytology-based screening strategies, opportunistic screening was more costly and less effective than an organized programme of screening every 3, 4 and 5 years. As such, ompared with the status of opportunistic screening, adopting a policy of organized, mass cervical screening in Hong Kong can substantially increase benefits and reduce costs.

Chapter 7

EARLY LIFE FACTORS

Key Messages

- Chronic diseases are now the major cause of death and disability worldwide.
- A study on Early Life Factors was done at CSHW to assess the relationship of it with NCD.
- The main effects of family history with diabetes and high blood pressure were significantly associated with the current diabetes status.
- Significant patterns of the probability of getting NCD have emerged from the study despite the fact that the sample size is low.
- The study clearly demonstrates a relationship between low birth weight and hypertension supporting the fetal origin hypothesis.

7.1 INTRODUCTION

The rapidly increasing burden of chronic diseases is a key determinant of global health. Chronic diseases are now the major cause of death and disability worldwide. Conditions including cardiovascular diseases, type 2 diabetes, obesity, cancer, and respiratory diseases, now account for 59% of the 57 million deaths annually and 46% of the global burden of disease. Chronic diseases increasingly affect people from developed as well as developing countries. In the developing world it is estimated that already 79% of deaths are attributable to chronic diseases.

A life course approach emphasizes a temporal and social perspective, looking back across an individual's or a cohort's life experiences or across generations for clues to current patterns of health and disease, whilst recognizing that both past and present experiences are shaped by the wider social, economic and cultural context. In epidemiology, a life course approach is being used to study the physical and social hazards during gestation, childhood, adolescence, young adulthood and midlife that affects chronic disease risk and health outcomes in later life. It aims to identify the underlying biological, behavioral and psychosocial processes that operate across the life span[1].

The fetal origin hypothesis which was put forward by David Barker in 1989 states that the life course begins in the womb, and the influences the fetus is exposed to during this time may leave a lasting mark on it. Current research strongly suggests that adverse influences during fetal life, including under nutrition and lack of oxygen, prompts the fetus to make numerous adaptations to sustain its development. These adaptations may result in persisting changes to organ structure and metabolism, which are called programmed. They are thought to lead to disease in adult life, such as circulatory diseases, diabetes, chronic airflow obstruction and disorders of lipid metabolism.

Moreover, the effects of fetal development may be carried into the following generation. It has been shown that the two main determinants of a baby's weight are the mothers' weight before she conceives and her own birth weight. It may therefore take generations before nutrition in the womb can be optimized. Further intensive research is needed to establish the cellular and molecular mechanisms, which may determine fetal nutrition and growth, and therefore guide interventions.

The concept of programming does not dismiss the influences and importance of risk factors operating later in life, such as smoking, excessive alcohol consumption, inadequate exercise, and obesity, all of which contribute to the development of chronic diseases. Instead it proposes that these environmental factors amplify the disadvantages that may have occurs in fetal life[2].

Dozens of large-scale epidemiological and experimental studies conducted in Europe, USA, Asia, and elsewhere have demonstrated a strong link between low birth weight and increased risk of developing chronic disease in later life. The list of chronic diseases linked to birth weight now also includes osteoporosis, chronic obstructive lung disease, polycystic ovarian

[1] Journal of Epidemiology and Community Health 2003, 57; 778 – 783
[2] WHO, Geneva, 199

syndrome, cancers of the breast, ovary and prostate, and mental disorders including schizophrenia and depression.

Curhan et al conducted a study to identify the relationship between birth weight and cumulative incidence of adult hypertension, incidence of non–insulin-dependent diabetes mellitus, and prevalence of obesity in a cohort of 22 846 US men (Health Professionals Follow-up Study). Compared with men in the reference birth weight category (7.0 to 8.4 lb), men who weighed <5.5 lb had an age-adjusted odds ratio for hypertension of 1.26 and for diabetes mellitus of 1.75. There was no material change after controlling for adult body mass index and parental histories of hypertension and diabetes mellitus. Compared with men in the referent group, the age-adjusted odds ratio of being in the highest versus the lowest quintile of adult body mass index for men with birth weight ≥10.0 lb was 2.08 (95% CI, 1.73 to 2.50). These findings supported the hypothesis that early life exposures, for which birth weight is a marker, are associated with several chronic diseases in adulthood[1].

Tian J.Y et al conducted a similar study to assess the relationship between birth weight and the risk of type 2 diabetes, abdominal obesity and hypertension among Chinese adults. The results showed that fasting plasma glucose was highest in subjects with the lowest birth weight (< 2500 g) compared with those with the highest birth weight. Waist circumference and systolic blood pressure showed U-shaped relationships with birth weight. Birth weight was found to be an independent risk factor for type 2 diabetes, abdominal obesity and hypertension. The highest prevalence of type 2 diabetes (34.5%) was observed among those with the lowest birth weight and abdominal obesity. The conclusions were that birth weight is inversely associated with the risk of type 2 diabetes. Subjects with the lowest or the highest birth weight were associated with a high risk of developing abdominal obesity and hypertension[2].

Doyle et al conducted a cohort study of 210 preterm survivors who had birth weights less than 1501 g and 60 randomly selected normal birth weight infants following them up to late adolescence to observe a relationship between very low birth weight and blood pressure. The conclusion was that blood pressure was significantly higher in late adolescence in very low birth weight survivors than in normal birth weight subjects[3].

A similar study was conducted by Rich Edwards et al of birth weight and risk of cardiovascular disease in a cohort of women followed up since 1976. The setting was the Nurses' health study, a cohort of 121 700 women followed up since 1976.

The main outcome measures were Non-fatal CVD, including myocardial infarction, coronary revascularisation, and stroke.

Among the 70 297 women free of CVD at baseline who reported birth weight in the 1992 questionnaire, there were 1309 cases of non-fatal CVD. Increasing birth weight was associated with decreasing risk of non-fatal CVD. The inverse trend was apparent for both coronary heart disease and stroke.

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[1]Curhan, Willet, Rim, Spiegleman, Ascherio, & Stamter, 1996;94;33-46,325

[2]Tian JY, Cheng Q, Song XM, Li G, Jiang G X, Gu YY, Luo M

[3]Doyle, Faber, Callanan, & Morley

The conclusion was that the results provide strong evidence of an association between birth weight and adult coronary heart disease and stroke[1].

Morikawa et al conducted a study to determine whether birth weight and childhood growth, especially rate of height increase, were independently related to major CVD risk factors in adult life. The authors conducted a 20-year follow-up study in a Japanese population, using the record-linkage method. The authors estimated that a 1-standard-deviation higher birth weight was significantly associated with systolic blood pressure that was lower by 1.6 mmHg in men and by 1.0 mmHg in women, and with a serum cholesterol level that was lower by 0.07 mmol/liter in men and by 0.04 mmol/liter in women, after adjustment for current weight and rate of height increase. The results suggested that lower birth weight and lower rate of height increase during childhood were both independently associated with increases in blood pressure and serum cholesterol in adult life[2].

In contrast to all the studies described above a study conducted by Stene et al revealed that the incidence for type 1 diabetes increased almost linearly with birth weight. The design was a population based cohort study by record linkage of the medical birth registry and the National Childhood Diabetes Registry in Norway. The results showed that the rate ratio for children with birth weights 4500 g or more compared with those with birth weights less than 2000 g was 2.21 (95% confidence interval 1.24 to 3.94), test for trend p = 0.0001[3].

The successes achieved in the Sri Lankan health sector are well known. The vital health statistical parameters indicate the successes achieved by the country. The infant mortality rates, the maternal mortality rates and the crude death rates have been significantly lowered since the beginning of the last century due to successful health policies in the country. At present the life expectancy for males and females are at 71 and 75 respectively and Sri Lanka, although having a modest GDP, has been hailed as a country that enjoys a good health status, which compares favourably with the developed countries

Due to these factors Sri Lanka is at present undergoing an epidemiological transition similar to the developed countries with diseases such as CVD (Coronary and Ischaemic heart diseases), Cerebro-vascular illnesses, Diabetes and Cancer playing a greater role in the morbidity and mortality patterns, whilst still having a considerable share of communicable diseases like malaria, tuberculosis, other vector borne diseases like Dengue Hemorrhagic Fever, Japanese Encephalitis, Diarrhoea and Acute Respiratory infections.

With the increase in the life expectancy of the population and the steady decline in fertility, Sri Lanka is also aging rapidly. It is projected that by 2020, 20 % of Sri Lanka's population will have reached 60 years of age or over. All this means that the health sector in the country will be overburdened in the future with a heavy toll of NCDs. Unlike Communicable diseases, NCDs

[1] BMJ 1997; 315

[2] American Journal of Epidemiology, Vol 153, No 8, 783 – 789

[3] Lars C Stene, Per Magnus, Kjersti S Ronningen, Geir Joner, Diabetes 50:2879-2882

require more finances for management on a long term basis. Also as life expectancy at birth increases, health expenditure per capita increases slowly at the beginning and rapidly at around the age of 68 years[1]**.** Therefore to provide the new services, delivery strategies are required to face the challenges of the health transition, and the existing policy framework needs to be reoriented in order to cope with new requirements. The HMP spells out three principles to meet the epidemiological changes,

1. Prioritizing & Characterization of Disease,
2. Exploration and Development of a New Strategy
3. Linking and Integrating Services and Systems.

Prioritization and categorization of the disease groups according to their natural history and characterization would help in planning and managing service delivery. Therefore policy for integration within the preventive area has to be based on tackling the risk factors for NCDs from the fetal stage to old age which is called the "Life Course Approach". This life course approach thus suggests that if a long term increase in healthcare expenditure is to be contained, it is necessary to understand the exposures that occur early in life in order to carry out early interventions in the high risk groups. It also highlights the necessity for the development of innovative health policies such as minimizing the low birth weight rate targeting each generation.

[1]Healthy and Shining Island, Health Master Plan 2007 – 2016, Sri Lanka

7.2 OBJECTIVES

This study was conducted therefore with the following objectives in mind,

- General Objective :
  - To study the relationship between early life factors and NCDs such as Ischemic Heart Disease, Hypertension, Diabetes Mellitus and Hyperlipidaemia in a cohort of adults over forty years of age who were born at CSHW, Colombo
- Specific Objectives :
  - To study the strength of relationship between LBW and specific NCDs - Diabetes Mellitus, Hypertension, Hyperlipidemia, and Ischemic Heart Disease;
  - To study the time trends between birth weights and different birth cohorts in a specific population; and
  - To identify the impact of confounders such as family history, BMI and lifestyle such as smoking etc and identify levels at which interventions can be used to prevent the evolution of NCDs.

7.3 METHODOLOGY

7.3.1 STUDY POPULATION AND SAMPLE

The study population consisted of all those who were born at the CSHW from 1950 – 1965. All those who responded and accepted the invitation to participate were included in the sample.

7.3.2 RESEARCH DESIGN

The available birth record, including the birth weight of all those who were born at CSHW between 1950 and 1965, were accessed and entered into an excel data sheet program.
About 15,000 letters were sent to the study sample in the data set explaining the purpose of the study with an invitation to participate to the addresses listed in the birth records.
A list was made of all those who responded to the invitation letter and dates were given for interview and examination in batches of thirty.
An interviewer-administered questionnaire was given to the participants following which blood investigations were done of the fasting blood sugar level and the lipid profile.
Analysis of results was done using the SPSS and SAS software packages.

7.3.3 DATA ANALYSIS

For the Univariate Analysis, the Chi-square test was used for finding significant variable for each response. When cell frequencies are less than 5, the Chi-square test is not valid for test of significance. Then Fisher's exact test is used for the checking significance of the Variables. For both tests significance level is taken as 20%.
For an advanced analysis process, each disease was taken as the Response Variable. Response variables are in categorical form with two outcomes. Therefore Logistic regression method was used for the advanced analysis. In the Model Fitting process, forward selection procedure was used for finding effective factors for the diseases. Significant variables for each disease which are identified from the univariate analysis are considered as the explanatory variables.
As the first step of the model fitting process, the main effect of each variable was added to the model one by one using a forward selection procedure. Then interaction terms of those variables were added to the model. For Diabetes, Model 1 was achieved as the best model with main effects. Interaction terms are not significant. Therefore they are not included to the model.

- P_{ij} =Probability of getting Diabetes

Model 1 : $$\log it(P_{ij}) = \text{constant} + \beta_i^{fhdia} + \beta_j^{hbp}$$

According to model 1, Model diagnostics proved that the selected model as the best model. The above selected model can be used for the Odd Ratio calculations.

In SAS for all Parameters, the last level is taken as reference level. Therefore odd ratios are interpreted with respect to last level of each parameter. Calculation of Odd ratio of having Diabetes for a person with a positive family history of Diabetes with respect to a person with a negative family history of Diabetes is 2.803. 95% confidence interval is 1.182, 6.646.

All the procedures that are used for getting model for diabetes are followed in building a model for High Blood Pressure, Myocardial Infarction(MI)/Angina Pectoris & Cholesterol.

- Q_{ijkl} : Probability of getting High Blood Pressure

Model 2: $$\text{logit}(Q_{ijkl}) = \beta_0 + \beta_i^{edu} + \beta_j^{bw} + \beta_k^{age} + \beta_l^{mi}$$

$$i = 1, 2, 3$$
$$j = 1, 2$$
$$k = 1, 2, 3$$
$$l = 1, 2$$

- R_i =Probability of getting Myocardial Infraction/Angina pectoris

Model 3: $$Logit(R_{ij}) = \beta_0 + \beta_i^{income} + \beta_j^{fhmi}$$

$$i = 1, 2, 3, 4, 5$$
$$j = 1, 2$$

- S_i =Probability of getting cholesterol

Model 4: $$Logit(S_i) = \beta_0 + \beta_i^{dia}$$

i=1, 2

7.4 RESULTS

The main effects of family history of diabetes, and high blood pressure were significantly associated with the current diabetes status.

There is a 2.8 times higher chance of having diabetes for a person with a positive family history of diabetes than a person with a negative family history of diabetes. There is a 2.4 times chance of developing diabetes for people with high blood pressure compared to people without high blood pressure.

The results did not show an association between the level of education and the blood pressure.

There is a four times higher chance to get hypertension in a person with a low birth weight, than in person with a birth weight more than 2.5kg. In comparison to the persons in the age range between 51 to 55 years, the persons in the age range between 41 to 45 years have a lower chance of getting hypertension. In comparison to the persons in the age range between 51 to 56 years, the persons in the age range between 46 to 50 years also have a lower chance of getting hypertension. Persons with a past history of myocardial infarction/ angina have a 6.8 times higher chance of getting hypertension than persons with no such past history. In comparison to higher income level (above Rs.50000), all the other income level shows lower chance for getting myocardial infraction or Angina pectoris. It implies that higher income level people have a higher risk of getting myocardial infraction or Angina.

There is a six times higher chance of getting myocardial infraction or Angina for the person with a positive family history of myocardial infraction or Angina with respect to a person with negative family history.

Also, it can be concluded from the results that, there is a greater chance of developing cholesterol for the people with diabetes.

7.5 DISCUSSION

Significant patterns of the probability of getting NCDs have emerged from the study despite the fact that the sample size is low. As mentioned earlier the life course approach emphasizes a temporal and social perspective, looking back across an individual's or a cohort's life experiences or across generations for clues to current patterns of health and disease, whilst recognizing that both past and present experiences.

7.5.1 SPECIFIC OBJECTIVE 1

According to objective 1 the study shows a four times higher chance of getting hypertension in a person with low birth weight. (The cut off level for LBW was 2500 kg) This compares well with the study done by Curhan et al (where the blood pressure was significantly associated with low birth weight) and the study by Tian et al. The fact that the U shaped curve between the birth weight and hypertension could not be elicited may be due to the fact that the sample size was so small. This may also be the reason for not being able to find a relationship between birth weight and diabetes mellitus, hyperlipidemia and Ischemic Heart Disease. The study done by Curhan et al had a sample of 22,846, and the study by rich et al 121,700, the study by Tian et al 973, the study done by Morikawa et al 4626 etc. Also these studies were follow up studies and of long duration. Therefore a conclusion cannot be reached at considering this study of the other diseases. The sample size is also not big enough to demonstrate the U shaped relationship observed with the birth weight and hypertension in the study by Tian et al. The sample was also not big enough to demonstrate the relationship between different grades of birth weights and hypertension as in Doyle et al.

7.5.2 SPECIFIC OBJECTIVE 2

The sample size is not big enough to demonstrate time trends of between birth weights and different birth cohorts and also in the available sample the numbers between the different birth cohorts were not enough to demonstrate a pattern.

7.5.3 SPECIFIC OBJECTIVE 3

The relationship between NCDs and lifestyle, age and family history are clearly distinguished in the study. Family history of diabetes and high blood pressure were clearly demonstrated with the present diabetes status with an odds ratio 2.8 times higher in a person with a positive family history of diabetes. The study also demonstrates a relationship between hypertension and diabetes mellitus indicating perhaps similar risk factors for the two diseases.

Also a six times higher chance of getting a myocardial infection or angina has been demonstrated in those with a positive history of myocardial infarction or angina and a 6.8 times risk of hypertension with a similar family history indicating that family history is a very strong risk factor. It can

be hypothesized therefore that if an individual may have had a low birth weight and also has a family history of hypertension or myocardial infarction that person would have a very high probability of getting hypertension in later life, indicating levels of intervention for secondary and tertiary prevention.

Age is also strongly correlated with hypertension with a relationship emerging of higher risk with higher age groups. This is and important indication for future health services in the country as it is estimated that in 2020 half of Sri Lanka's population will belong to the older age group.

Other relationships included a higher risk of getting angina for higher income groups. The study did not correlate this with employment categories which might be a confounder for this variable.

7.6 CONCLUSIONS, LIMITATIONS & RECOMMENDATIONS

The study clearly demonstrates a relationship between low birth weight and hypertension supporting the fetal origin hypothesis.
It also demonstrates the importance of confounders such as family history and income level.
The limitations of the study included:

- Even though the study was originated with the best of scientific interest and design there was no way of identifying all the limitations without actually starting the study.
- Even though the study population according to the birth records is 15,000, the number who was willing to participate in the study was only 420, thus causing a big bias in the study sample.
- Of those who responded, the birth weights were available only of 120, thus limiting the sample further and causing further bias in the sample.
- The sample was so small that it was not possible to identify distinct patterns with a high level of confidence.
- Verification of confounders could not be done due to lack of time
- This sort of a study requires adequate time, finances and human resources and all three of these were lacking.

Despite many limitations the study has yielded important results that should be explored in a bigger study with more resources.
Since studies to test the Barker hypothesis have been done in many parts of the world and strong correlations have emerged from these studies which are important for policy implications, it is important to conduct more studies in Sri Lanka specially as Sri Lanka is undergoing epidemiological and demographic transitions. Considering evidence for future policy directions to prepare for the future health needs of the country studies should be conducted to elicit:

- Early life interventions to ensure the highest possible functional capacity
- Adult life interventions aimed at slowing down the decline
- For those in older age above disability threshold, revisiting previous interventions
- For those in an older age below the disability threshold, interventions aimed at improving quality of life

Finally it is recommended to conduct a similar study based on the results of this study taking into consideration all the available birth records in a specified population and to systematically identify the individuals in the sample and collect information from them during a specific time frame and following them prospectively to identify changes due to life styles as in the case of the Framingham Heart Study to identify levels at which interventions can be used.

Chapter 8

BEHAVIOURAL RISK FACTORS IN KURUNEGALA

Key Messages

- Lack of knowledge on the importance of physical activity is one of the determinants of physical inactivity.
- The determinants of healthy diet at the community and country levels are mainly dependent on cultural pattern and policies related to food and agriculture.
- People are initiated to using tobacco and alcohol by the aggressive strategies of the industry, which targets primarily the youngsters.
- The root cause for persistently high level of stress in general has been identified as the change of socio-cultural system following open economy in the country.

Representatives from the RDHS Kurunegala, BH Kuliyapitiya and MOH have identified the priority risk factors for NCDs as physical inactivity, unhealthy diet, use of tobacco and alcohol, and inability to cope with persistently high levels of stress. They collaborated with the JICA EBM Study, representatives from WHO and other local experts in analyzing the causes of these risk factors and the options to address them, identifying the priority target groups and defining the key communication messages, and discussing possible indicators to monitor progress in reducing the risk factors. This section is a product of a series of discussions at the national and local levels.

8.1 PHYSICAL INACTIVITY

8.1.1 PROBLEM ANALYSIS

Lack of knowledge on the importance of physical activity is one of the determinants of physical inactivity **(Figure 8-1)**. Less awareness among the public can be partly attributed to less commitment from media personnel and lack of proper exercise programmes. The education system is more centred on studies and school children lack knowledge on the importance of physical activity.

When compared to other countries in the world, Sri Lanka does not have an exercise culture. Less facilities as well as negative attitudes and myths about exercising are some of the causes.

More and more people prefer white collar jobs than agricultural jobs at present. The change in occupational pattern has promoted sedentary behaviour among workers.

Introduction of open economic policies has lead to economic, social and cultural changes in Sri-Lanka, creating increased competition and attitudinal changes. As a result, nuclear family system has set in, and these attitudinal changes have even lead to loss of unity in villages causing lack of social support. People are forced to choose between competing priorities and this in turn has caused lack of time. These factors have contributed to a busy life style and it is identified as one of the causes of physical inactivity.

Middle-east employment and rapid expansion of lending facilities have increased affordability in people. Flexible importation policies have resulted in increased availability of motor vehicles. As a result, people use more modern motor vehicles and this is identified as another cause of physical inactivity.

Automation of factories and increased knowledge and awareness on machinery has lead to increased usage of modern machinery making people less physically active.

Most people are addicted to television at present. Watching television promotes sedentary behaviour. Addiction to television and computers has made children physically inactive.

It is important to note that these factors have contributed to physical inactivity among people in Kuliyapitiya as well. More studies are needed to assess the prevalence of physical inactivity in this area.

The objective for intervention would be to increase physical activity among participants.

8.1.2 OPTIONS

- Provision of community facilities to engage in physical activities –
- It is essential to plan and conduct awareness programmes for the study population. Separate programmes for the health staff and patients would be beneficial. The awareness programmes could be in the form of lectures/demonstrations. The content should highlight the importance of physical activity, and the usefulness and health benefits of physical activity. The ill-effects of physical inactivity should be emphasized and myths and beliefs should be tackled with correct advice. Distribution of leaflets with key messages on physical activity should be done among staff members and patients. These leaflets should be simple, user friendly, attractive and informative. Posters and flyers should be exhibited in the hospital premises. These should be eye catching with important key messages.
- Initiate physical activity promotion programmes in targeted places like schools, workplaces –
- A park should be provided for Kuliyapitiya area. This has to be done with the help of local politicians and local government officials. If there is a park already, it should be properly improved and maintained.
- Promotion of healthy lifestyles in the study population with regards to knowledge and attitudes –
- Awareness campaigns on physical activity should be organized in schools with the help of the MOH at Kuliyapitiya. This could be done at the time of the school medical inspections. Schools should be provided with posters and flyers which are designed to promote physical activity. Leaflets with key messages too should be distributed. Time tables and name stickers with key messages on physical activity should be freely distributed among children. Teachers too should be targeted. Awareness campaigns by way of lectures/demonstrations should be conducted in identified work places (e.g. garment factories, banks, offices).

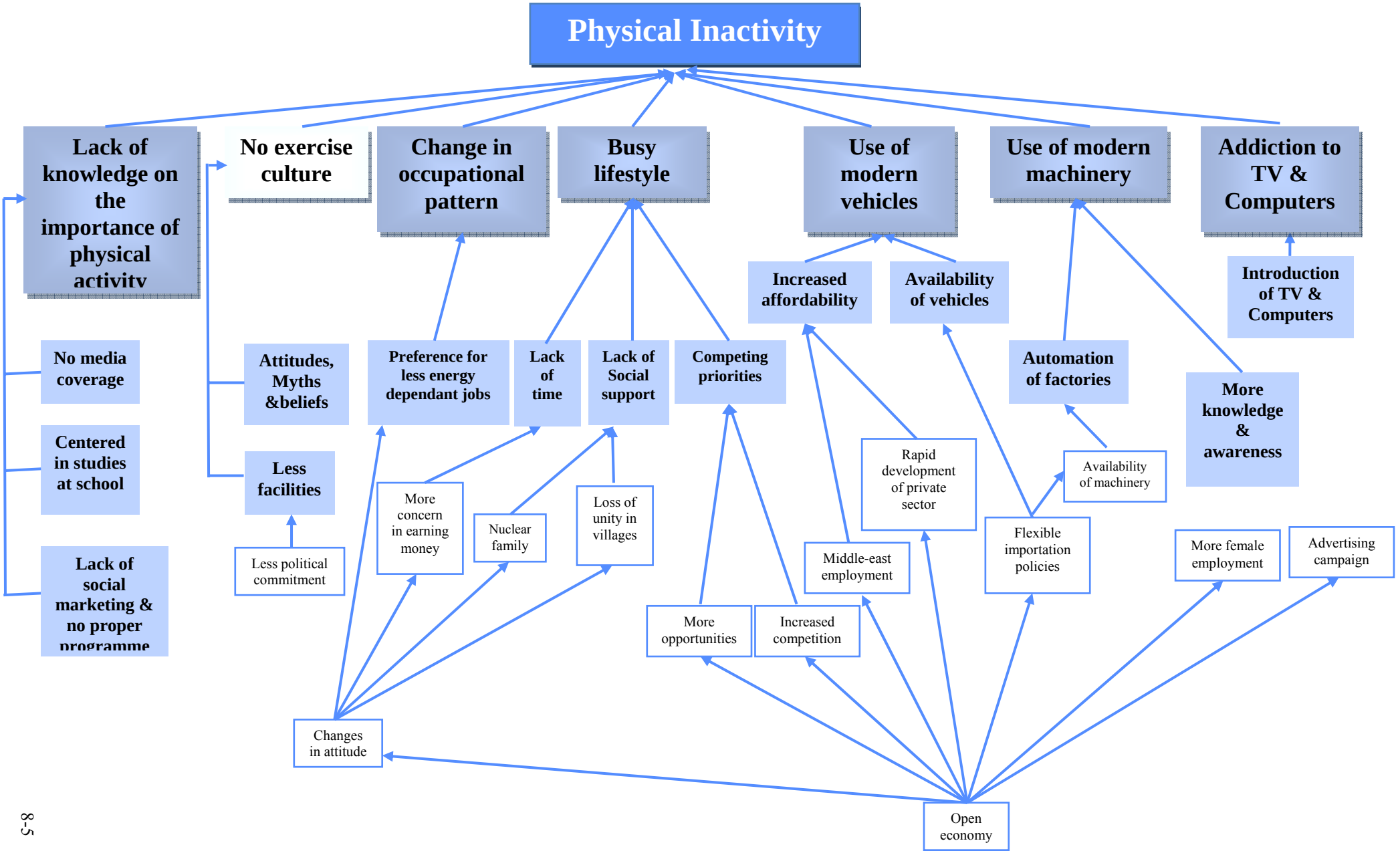

FIGURE 8- 1: DETERMINANTS OF PHYSICAL ACTIVITY

8.1.3 COMMUNICATION MESSAGES

Promotion of physical activity should be started from childhood because children are very receptive. Also, they have lots of opportunities to cultivate the culture of exercise. The adolescents are quite receptive, too, and should be targeted effectively. Adults are the most vulnerable group. It is very important to target them. Most adults in the world are physically inactive. The estimation is 60% - 85% of adults. This trend is seen in both developed and developing countries. Women should also be a priority target group. Because of certain myths, they do not consider physical activity as an important part of life.

TABLE 8- 1: EXAMPLES OF KEY MESSAGES RELATED TO PHYSICAL ACTIVITY

Target	Message	Rationale
All	Physical inactivity: A major risk factor for CVD and Diabetes.	This can be used to transfer knowledge in the study population. Physical inactivity is a global health problem.2 millions deaths occur every year due to physical inactivity.
	Physical inactivity doubles the risk of CVD, type II diabetes, and obesity and causes lipid disorders.	Cardio-vascular disease is the number one cause of mortality in Sri Lanka at present. CVD and type II diabetes in increasing in Sri Lanka with more and more young adults getting affected.
	Regular physical activity will make you healthier and wealthier.	This can be used for transferring knowledge. Regular physical activity will reduce risk of dying prematurely from cardio-vascular disease and stroke. It decreases the risk of developing CVD, hypertension and type II diabetes. No need of gyms. Walking briskly for 30 minutes a day will take you a long way.
	Brisk walking for 30 minutes daily is sufficient according to American heart association.	This is also to transfer knowledge to the study.
	Engaging in simple household work is not enough. Proper physical activity is needed.	This can be used to combat myths. Most women think that engaging in household work is enough and they need not do additional physical activity. If women are not engaging in brisk work, they need to do additional but simple and acceptable activities like brisk walking for 30 minutes daily.

Children	Physical inactivity will make you ill and suffer.	
	Regular physical activity will keep you healthy for the rest of your life!	
	Healthy children will make a country healthier.	
	Start exercising now.	
	Do simple exercises like walking, swimming, cycling for about 30 minutes daily.	
	Make exercises a day today activity in your life.	
	You will be the lucky winner for a healthier future.	
Adolescents	Physical inactivity - a silent killer.	
	Do you want to lead a healthy and joyful life?	
	Engage in physical activities regularly.	
	Simple exercises like walking, cycling, swimming for 30 minutes daily is more than enough.	
	Take the leadership to cultivate exercise culture in the country.	
	Healthy energetic adolescents - The hope of a country.	
Adults	Health is wealth. Illness is costly.	
	Regular physical activities will make you healthier and wealthier.	
	No need of gyms or expensive exercise machines.	
	Walking for 30 minutes daily will take you a long way.	
	Make your body sweat and feel your heart laugh.	
	No room for delays!	
	Start exercising from today.	
Elderly people	Stay physically active.	
	Enjoy healthy aging.	
	Physical activity is important for healthy aging.	
	Walking for 30 minutes daily, will take care of you.	

Newly diagnosed patients	Start gradually. Build up slowly.	
	Listen to your doctor and get his advice.	
	Do regular physical activity.	
Women	Do you want to see your children grow?	
	Regular physical activity will help you to live longer without chronic diseases.	
	No need of gyms.	
	Walking for 30 minutes daily will make you healthy.	
	Start exercising from now.	
	Make exercises a part of your self.	

8.1.4 INDICATORS

The short version of the IPAQ, represented in **Table 8- 2**, has been validated in Sri Lanka previously. This instrument is simple, user friendly and not time consuming; hence, it is selected for the monitoring and evaluation process. This questionnaire can be used in the age group of 15-69 years in order to obtain internationally comparable data in physical activity during the past 7 days. IPAQ has been modified considering the cultural aspects in the previous validation study. Certain activities in the IPAQ have been substituted by activities that are more culturally relevant and appropriate to the Sri Lankan situation. Since there is an intervention, the same instrument should be administered before and after the intervention for monitoring and evaluation. The effectiveness of the intervention will be assessed by re administering the IPAQ after 6 months. It is important to assess the percentage change before and after the intervention. Physical and biochemical indicators of physical activity are not discussed since they are not feasible in this study at Kuliyapitiya.

TABLE 8- 2: EXAMPLES OF QUESTIONS TO MONITOR PHYSICAL ACTIVITY

Question	Answers	Rationale
Introductory question: The following questions will ask you about the time you spent being physically active in the last seven days. Were the physical activities that you did during last seven days very much similar to those of one of your 'usual' weeks?	(encircle the number) 1. Yes 2. No *If the answer is "No"*, then please recall one of your usual weeks and answer the following questions.	
Vigorous physical activity Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.		

Intensity of vigorous physical activity During the last seven days, on how many days did you do vigorous physical activities like heavy lifting, chopping wood, digging earth, aerobics, fast bicycling / swimming or climbing steps?	1. ..... days per week 2. No vigorous physical activity	It is important to assess the number of people who are engaged in vigorous physical activity. According to the American Heart Association, adults should engage in vigorous physical activity on most days of the week or at least 3-4 times per week.
Duration of vigorous physical activity How much time did you usually spend doing vigorous physical activities on one of these days?	1. ..... hours per day (if more than 1 hour) 2. ..... minutes per day (if less than 1 hour) 3. Do not know/ not sure	As stated above, vigorous physical activity is essential to stay active. According to the American Heart Association adults should engage in vigorous physical activity at least for 30 minutes or more on most days of the week (at least 3-4 days per week.). Therefore, the duration of physical activity is important too.
Moderate physical activity Think about all the moderate activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe some what harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.		
Intensity of moderate physical activity During the last 7 days, on how many days did you do moderate physical activities like carrying light loads , bicycling at a regular pace, washing clothes or vehicle, swimming or gardening.? Do not include walking.	1. ..... days per week 2. No moderate physical activity	It is important to know the % of people engaged in moderate physical activity. With the intervention this category should aim for vigorous physical activity.
Duration of moderate physical activity How much time did you usually spend doing moderate physical activities on one of those days?	1. ..... hours per day (if more than 1 hour) 2. ..... minutes per day (if less than 1 hour) 3. Do not know/ not sure	It is important to assess the duration of physical activity as stated earlier.
Walking Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise or leisure.		
Intensity of walking During the last 7 days, on how many days did you walk for at least 10 minutes at a time?	1. ..... days per week 2. No walking	Brisk walking is a good form of physical activity. Therefore it is important to assess this.

Duration of walking How much time did you usually spend walking on one of these days?	1. ..... hours per day (if more than 1 hour) 2. ..... minutes per day (if less than 1 hour) Do not know/ not sure	As stated earlier the duration is important.
Sitting		
Duration of sitting How much time do you usually spend watching TV per day?	..... hours per day	This is an example for physical inactivity. After the intervention the % number of people who are physically inactive should decrease.

8.2 UNHEALTHY DIET

8.2.1 PROBLEM ANALYSIS

The WHO Global Strategy on Diet, Physical Activity and Health recommended the following for populations and individuals:

- Achieve energy balance and a healthy weight;
- Limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of trans-fatty acids (less than 30 % of total energy and recommended portion from unsaturated fats);
- Increase consumption of fruits and vegetables (at least five moderate size portions), and legumes, whole grains and nuts;
- Limit the intake of free sugars; and
- Limit salt (sodium) consumption from all sources and ensure that salt is iodized.

Individual, family and community factors may be responsible for not achieving these targets. Individual eating habits and preferences for certain foods are the core behaviours that influence a healthy or unhealthy diet. Family practices of cooking, occupational demands, income level and educational level of the individual also influence these key behaviours. To a large extent, knowledge about healthy diet, ideal body weight, weight reduction, medical problems related to obesity and existence of NCD among family members will also influence food consumption patterns.

The determinants of healthy diet at the community and country levels are mainly dependent on cultural pattern and policies related to food and agriculture. With the economic growth over the last three decades, western food consumption pattern has emerged and this is mainly responsible for this kind of an unhealthy food consumption and unbalanced energy intake. This has influenced not only the so called rich people but the poor segments of the population also.

Lack of a clear food policy (recently adopted) and especially the poor implementation of such a policy by different stakeholders are crucial factors at the top level that is responsible for unhealthy food practices in the country. Unchecked media advertising, coupled with other social changes, has greatly promoted increase consumption of unhealthy diet among all sectors. Social trends as well as emerging and wide use of new food-processing techniques have contributed to the increase in the processed food consumption and fast food industry. Busy lifestyle and migration also contributed directly to increase consumption of unhealthy food consumption in all sectors.

As such, the objective of interventions could be to establish healthy eating habits and energy balance among target groups at the BH Kuliyapitiya and MOH area.

8.2.2 OPTIONS

The types of approaches recommended for different settings are individual-focused, community level involvement and policy changes.

- Individual level –

  Targets groups must be clearly identified and culturally sensitive, reasonable messages should be delivered using different communication methods to the relevant audience. The major activities will include group discussions, practical demonstrations, and lectures related to healthy diets and energy balance. Ensuring the availability of and accessibility of simple reading materials and audio-visual aids will also help to achieve the required health literacy. Health promotion processes should be incorporated into routine practice of hospitals, clinics, and field level clinics and home visits by PHMs. Building the capacity of volunteer groups and health staff will increase the penetration of such knowledge and practices into the community.

- Community level –

  There is a need to identify crucial settings to implement programmes related to healthy lifestyle. These settings may include: schools and school health clubs; workplaces (government and private); community level organizations and religious places; and government hospitals OPD, clinics, MOH antenatal, well woman, child weighing posts and general practice. The critical steps are to identify the settings early, then involve the targets in policy development, planning and programme implementation. As such, partnership building is crucial to success.

- Policy and environmental changes in the target settings –

  This may require the health sector to reorganize and retool so that it will have a better capacity to participate in improving healthy eating habits in various settings. For example, health staff will need to improve its skills in collaborating with industries. They need to be retrained also on healthy lifestyle and health promotion.

There is also a need to develop an appropriate information system that will provide the evidence for monitoring and evaluation of the interventions as well as for monitoring the progress at the individual level.

8.2.3 COMMUNICATION MESSAGES

The key messages may be classified into four groups.

- Know your healthy body weight –

  What is my BMI? Change the image attached to obesity (poster display)

- How can I maintain an ideal body weight? –

  Basic knowledge about energy balance (pictorial representation)

- How can I reduce my body weight? –

  Reduce energy dense foods (high sugar, high fat frequent meals); reduce ¼ of the usual diet; replace with less energy dense foods

(fruits, vegetables); moderate on your diet; regularly check your weight

- What are healthy eating habits? –

  Vegetable/fruits of 2- 3 medium size portions per day, add a salad almost every day; reduce high sugar and fatty foods; legumes and whole grains 2-3 time per week; do not skip meals; always home made foods / avoid fast foods as much as you can; follow the Food Pyramid (based national guidelines – revised version still not available); avoid high salt and salty foods; and increase water intake at least 5-7 glasses per day.

8.2.4 INDICATORS

One approach is to have indicators for monitoring the targets spelled out in the Global Strategy. This would require questions on total energy and intake of fruits and vegetables, free sugars, iodized salt, and fats **(Table 8-3)** Physical measurements may include body weight and waist circumference. Biochemical measurements will be on fasting blood sugar with/without lipid profile.

Another approach is to adopt a short version of the Food Frequency Questionnaire because unhealthy dietary practices such as high consumption of saturated fats, salt and refined carbohydrates as well as low consumption of fruit and vegetables tend to cluster together. The consumption of fruits and vegetables has been widely believed to promote good health. Evidence related to their protective effect has only been presented in recent years[1]. WHO recommends a minimum of 5 servings per day or 400g per day.

TABLE 8- 3: EXAMPLES OF QUESTIONS TO MONITOR DIET

Question	Answers	Rationale
In a typical week, how many days do you eat fruit?	..... days	Monitoring the intake of fruits
In a typical week, how many servings of fruit do you eat on one of those days? (show the portion size and type of food- picture card)	..... servings	Monitoring the intake of fruits
In a typical week, how many days do you eat vegetables?	..... days	Monitoring the intake of vegetables
In a typical week, how many servings of vegetables do you eat on one of those days? (show the portion size and type of food- picture card)	..... servings per week	Monitoring the intake of vegetables

[1] Nestle, 1999; Law & Morris, 1998; Ness & Powles, 1997

How do you describe your sugar intake per day (with tea or added)?	..... Spoons per day	Monitoring the intake of sugar
How do you describe your habits of eating sugary foods like?	..... Biscuits per week ..... Jams (tea spoons per week) ..... Soft drinks per week	Monitoring the intake of sugar
How do you describe your salt intake?	1. Very low 2. Low 3. Medium 4. High 5. Very high	Monitoring the intake of salt
Which of the following methods at your home are the first choice and your second choice in food preparation?	1st 2nd Deep frying Tempering With thick coconut milk With diluted coconut milk Steamed As fresh as possible Others (specify)	Monitoring the intake of fat
What is the most commonly used oil (liquid or hard oil) for frying at your home?	1. Coconut oil 2. Soya/ Canola/ Sunflower/ Gingerly/ Olive/ Corn oil 3. Other vegetable oil 4. Margarine 5. Others (specify)	Monitoring the intake of fat
How do you describe your consumption of coconut?	..... Coconuts per day ..... Number of house hold members	Monitoring the intake of fat
Do you repeatedly use the same oil for deep frying?	1. Yes 2. No	Monitoring the intake of fat
How do you describe your consumption of meat and meat products?	..... servings per week	

8.3 TOBACCO AND ALCOHOL USE

8.3.1 PROBLEM ANALYSIS

The use of alcohol and tobacco in Sri Lanka can be attributed to several factors **(FIGURE 8- 2**) People are initiated to using these substances by the aggressive strategies of the industry, which target primarily the youngsters. The industry creates and associates consumption with very attractive images, which promote the appeal of the young people to start consumption. Unfortunately, many people still lack the knowledge about the real harm of alcohol and tobacco.

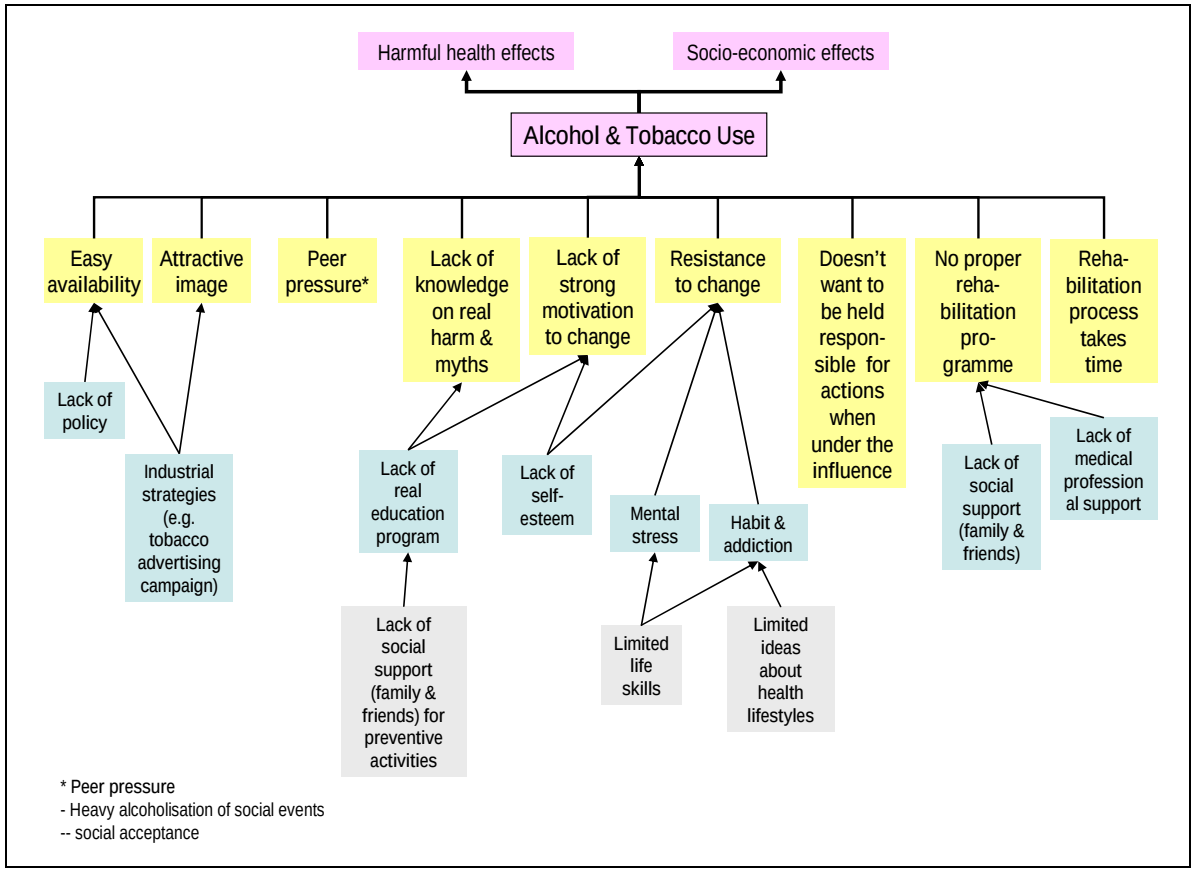

FIGURE 8- 2: DETERMINANTS OF ALCOHOL AND TOBACCO USE

The current users persist with their habit partly because of their lack of knowledge, lack of motivation, and sheer resistance to change. A group of people continue to consume these substances because of addiction. Others who have taken up the habit continue to do so even when they are well aware of the consequent problems. This stubborn continuation of the use may not be related to addiction. Mental stress which is on the rise also contributes to the problem as the people use alcohol and tobacco as a form of relaxing from the mental stresses.

The society promotes the consumption through the social acceptance of the use particularly among the males. In Sri Lanka the society does not generally accept the use of alcohol and tobacco among females. The peer

pressure is mainly related to initiation but it also contributes to the continuation of the use. The level of education is also related to the use to some extent especially for use of tobacco.
Due to non availability of a proper rehabilitation programme people may tend to continue the use even if they have the intentions to stop.
The objective of intervention would be the reduction in the use of alcohol and tobacco.

8.3.2 OPTIONS

- Increase the knowledge on real harm of tobacco, alcohol and other drugs-

  Both the users and nonusers will be made aware about the real harm of tobacco, alcohol and other drugs. This will be conducted as a series of public lectures, workshops and awareness campaigns. The knowledge will be given as a series of short messages to ensure proper grasping of the concept delivered. A place and a schedule for the events can be prepared at the beginning of the project so that everyone will get involved and responsibilities can be shared.

- Create and environment that aid the prevention of tobacco, alcohol and other drugs –

  For the purpose, creation of non-smoking zones and creation of a culture that demotes the use is important in this respect.

- Reduce the social acceptance of tobacco, alcohol and other drugs –

  Organizing awareness campaigns for the health staff and the general public of the surrounding area will complement the display of messages.

- Implement the available policies for tobacco, alcohol and other drugs –

  A dialogue should be arranged with the relevant policy and decision makers of the area to implement favourable policies for drug demand reduction. E.g. Police, Health Authorities, School Principals etc

- Make good quality rehabilitative services available at the BH Kuliyapitiya –

  The services of the Mental Health Services and professional counsellors should be utilized in the process.

8.3.3 COMMUNICATION MESSAGES

A. TARGET GROUPS

The target groups were selected with the objective of minimizing use of alcohol and tobacco within the hospital and surrounding area:

- Users and Addicts;
- Well groups and risk groups;
- Women and Children; and

- Policy Implementers.

B. KEY MESSAGE PER TARGET GROUP

The key messages **(Table 8- 4)**were selected separately for different target groups as the level of understanding, setting of the intervention and the methods of delivering the message are presumed to vary in different settings.

TABLE 8- 4: EXAMPLES OF KEY MESSAGES RELATED TO REDUCING ALCOHOL AND TOBACCO USE

Target	Message	Rationale
Users and addicts	Alcohol and Tobacco use is more of a psychological addiction rather than a chemical addiction	It is more of resistance to change and the industrial strategies that make the users believe that they are addicted to substances and that they are unable to overcome the addiction. The users will be given skills to analyse and see their own situation.
	Benefits of quitting tobacco and effectiveness of rehabilitation	The strategy of using ex-users to deliver the message to the users will be adopted, as it is a method with proven effectiveness. The users themselves will be guided to draw up a plan for quitting smoking and stopping alcohol. Another message will be to educate them on how to stop the use as a group.
	Quitting tobacco/stopping alcohol is simple, easy task and that it is beneficial to all the groups concerned.	The users will be shown the economic, health, social and other benefits of quitting the use and how their lives will be improved if they quit. The real life examples will be shown to them.
Well and at risk	Disadvantage of Addiction to tobacco or Alcohol	The group will be educated on the average amount of money spent on tobacco and alcohol by the users and compare that with their total income. How this money will be more effectively used will also be discussed.
	Industrial Strategies	The common strategies used by the industry to promote use and ensure the continuation of the use will be discussed under this key message.
	Media Influence (Direct/Indirect Advertising)	The group will be educated on the direct and indirect advertising strategies used to promote alcohol and tobacco with examples. The examples will be shown as videos and audio spots.
	Educate on the scientific views about myths associated with tobacco and alcohol use	Most people know that Alcohol and tobacco are harmful but many of them seriously underestimate the severity of the harm. The impact of alcohol and tobacco varies from place to place, person to person and the response has to be based on the situation.
Women and children	Helping the husband/father to free them from habit	The females can play an important role in helping their husbands/fathers/friends to free themselves from alcohol and tobacco use.
	You have to protect yourselves from passive smoking	Exposure to passive smoking is harmful and passive smoking can cause harmful effects to the foetus (LBW) if the mother is exposed to passive smoking.

	Avoid giving unfair privileges to the alcohol users	Privileges given to those who have consumed alcohol are many but most are not readily recognized. Recognizing those conferred on alcohol users is the first step towards the change. Permission to "get away with" behaviour that is normally not allowed can be given as an example. Removing unfair privileges removes one factor that promotes alcohol consumption.
Policy implementers	Appropriate restriction of availability	Reducing access and affordability reduces alcohol-related problems. But individual communities usually have insufficient power to do this. Some communities have successfully restricted illicit alcohol sales. But the effort required to do so is difficult to sustain. As a small community, Kuliyapitiya does not have a capacity to create national policy changes. But improving awareness in our small communities about the available policies and taking action to enforce them strictly would contribute to successful prevention programmes (e.g. strict enforcement of no smoke zone policy).

8.3.4 INDICATORS

Monitoring and evaluation of the effectiveness of the alcohol and tobacco prevention programme is a difficult task. The reporting of the level of consumption depends on the individual perception about the use. Some may under report it while some may over report it. Therefore the indicators for monitoring have to be derived carefully and indirect measures may have to be used for monitoring. Some indicators that may be considered to establish the baseline, to know the average level of consumption in the locality area and to allow monitoring of trends over the time are:

- How many cigarettes and other tobacco products do you consume per day?
- What is your frequency of tobacco consumption?
- How much money do you spend on tobacco per month?
- What is the main type of tobacco consumed?
- How much alcohol do you consume per day?
- What is your frequency of alcohol consumption?
- How much money do you spend on alcohol per month?
- What is the main type of alcohol consumed?
- Reporting of the diseases related to consumption - Admissions due to violence related to alcohol; Admissions/deaths due to diseases related to alcohol; Admissions/deaths due to diseases related to tobacco.

8.4 INABILITY TO COPE WITH PERSISTENTLY HIGH LEVELS OF STRESS

8.4.1 PROBLEM ANALYSIS

The root cause for the persistently high level of stress in general has been identified as the change of the socio-cultural system following open economy in the country (**Figure 8- 3**). It has lead to socio-cultural disintegration and a moving away from traditional concepts of sharing and caring at the society level. People and families have become more individualistic in their approach to the day to day life and have forgotten about the society and the environment around them. The population policy has made our families smaller and that has lead to loss of the extended family system, which has been giving a protective effect on families and children. New media culture and materialistic lifestyle with a craving for money on all aspects of life has made the individuals more stress prone. As there is no support system for the people to seek help when they cannot cope up with high stress leads some of them to alcohol and other addictions. At the societal level it is more of indirect causes that had lead to high level of stress than at the individual level.

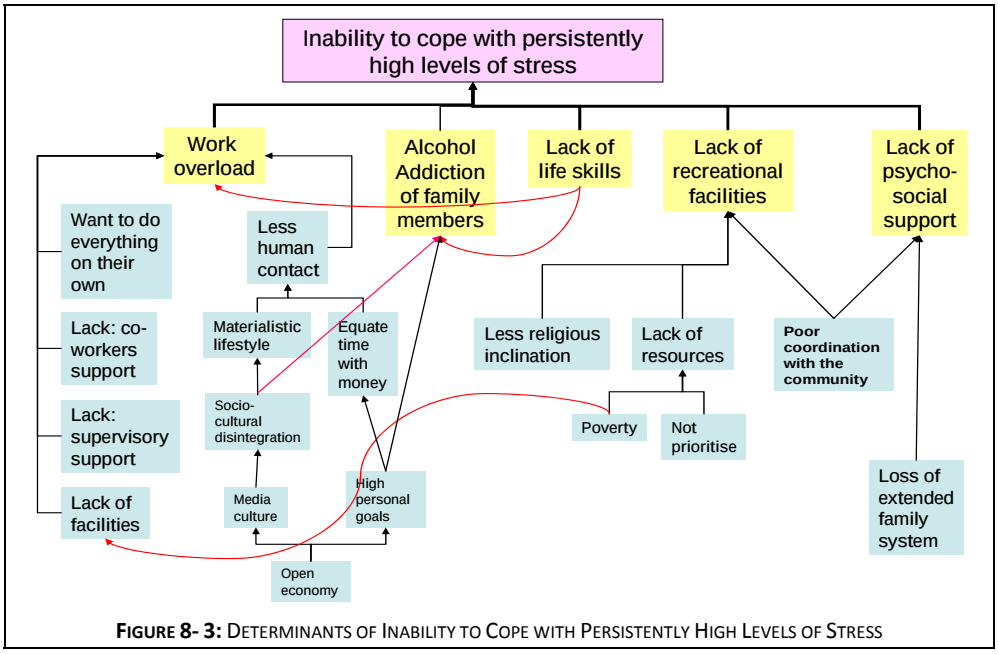

FIGURE 8- 3: DETERMINANTS OF INABILITY TO COPE WITH PERSISTENTLY HIGH LEVELS OF STRESS

Individual and institutional level causes of stress are mainly due to lack of certain skills like time management, financial management and delegation of duties among individuals and administrators. Work overload, lack of appraisal systems and resources also cause stress. Lack of recreational and other facilities for the staff and community causes stressful lives in the workplace and the society. But the indirect cause of most of the factors is poverty.

The poor coordination with the society by the institution has lead to frequent conflicts with the public has made both staff and the community

stressful. It is difficult to identify direct and indirect causes for persistently high stress as it is a web of causations than one direct cause. Thus approach on relieving also should be a holistic one.
In Kuliyapitiya, it is mainly the effects of open economy that has a bearing in the society than the poverty. At the institution level work overload and lack of life skills may be the cause of stress among staff.
The objective will be to develop coping skills on persistently high levels of stress among hospital staff, patients and the community in Kuliyapitiya MOH area.

8.4.2 OPTIONS

- Religious activities –

  This will help specially the staff and even the community to get away from their routine activities. As Sri Lanka has many holidays and days given to different religions they can be arranged on such days. Buddhists being the majority there are alot of activities (e.g. Pirith ceremonies, bana, dana) that can be carried out with the help of the community and the staff. This will lead to sharing responsibilities among individuals, improve the communication with the society and delivery of some of the healthy messages through the priests participating in these events. A place and a schedule for the events can be prepared at the beginning of the project so that everyone will get involved and responsibilities can be shared.

- Recreational activities/facilities –

  Recreational activities and the places for them at the village level and the institutional level should be assessed before starting the project. Appropriate modifications to the existing ones and low cost, less time consuming activities should be recommended. For example, volley ball court for the village /institution will increase the human contacts as well as creating oneness as a village or institution. It will have an effect on physical fitness and stress.

- Creche –

  This as a solution for the working mothers with lack of a supporting system for.This can be established at the village temple or in the institution where they work.

- Workshops/lectures –

  Public lectures and workshops should be arranged to pass on the knowledge and enforce the already existing knowledge to the workers and the villagers. Life skills development can be carried out through this. Topics can be on communication, personnel development, time management, environment, alcohol abuse. There can be some entertainment programmes involving everyone on a scheduled basis to give a break for the individuals from the routine wok.

- Integrated meetings with the society –

  Few meetings can be arranged where community and staff of the hospital get together for common objective such as during New Year celebrations, Christmas, and Vesak festival

- Resource centre –

  There should be a resource centre for the village or at the institution where people can seek refuge whenever somebody needs help or under stress. A person familiar with basic counselling skills should be manning the centre on a regularly.

8.4.3 COMMUNICATION MESSAGES

A. TARGET GROUPS

Broad target groups were selected, and therefore the messages should be more broad in creating awareness. These messages give a chance for people to think about their lifestyles in a novel approach rather than going on the conventional way. The acceptability of the messages in the cultural and religious setting also kept in mind while phrasing them.

- Community –

  Community awareness is needed for any intervention as they are subjected to different dimensions of stress. The approach should be developing coping up skills while creating ability to cope up with stress. The vulnerability for persistent high stress depends on the individuals.

- Health staff –

  Most of the health staff is under high stress as they have to work under a less resourceful demanding environment in the hospitals. Sometimes they lack necessary support from the institution and the subordinates to cope up with the work overload .Thus there is a need for having targeted messages for them.

- Students/children –

  The messages have targeted the students with the aim of developing their skills in coping up with the stress and with the aim of inculcating some of the habits to their lifestyles making them less vulnerable for NCD. They will be receptive to these messages as children like to adopt the newer way of lives easily.

B. KEY MESSAGE PER TARGET GROUP

Key messages were developed for different target groups by considering the reasons that came up in the situational analysis of the problem of stress **(Table 8- 5).** However these messages should be reviewed by a panel of experts and decide on the suitability of the messages once they are translated into local languages. Few key messages can be hand picked to be used in the project following deliberation of the experts.

TABLE 8- 5: EXAMPLES OF KEY MESSAGES RELATED TO COPING WITH STRESS

Target	Message	Rationale
Community	World depends on us…. not me…	This message is formed to bring the people out of their shells and make them understand they should give up the individualistic approach to life .They can achieve more by sharing and caring others and be more successful in life by constant contacts with the others.
	Helping friends /neighbours brings you happiness…	This is to remind the people that they should share responsibilities as a society and help each other and enjoy the life more than worrying about the things that we can not achieve.
	Be simple and sensible in life…	If a person does not have high goals in life and is more practical, it is better than be materialistic .It will help them to be more relaxed and happy in their day to day work. This message mainly will influence the attitude and the behaviour of people. It is more practical in a majority Buddhist setting.
	Life runs well in the middle path…	This is a Buddhist teaching and says that people should lead a very balanced life and should be satisfied and happy with what they have than be unhappy of what they do not have. This message will remind the principles of Buddhism to the community.
Staff	Share your feelings…	This message tries to influence the staff by telling them that they should be open in their conversations with the subordinate officers than keeping everything to themselves and worrying about them. This may be at the institution level as well as in the family level. Being open about your concerns on anything related to your work can harmonize your relationship with others and it lessens your stress.
	Know your limitations…	Once a person understand the limitations and his capacity to work he will not be burdened by stress, especially at the work place as he knows what is the achievable goal for him.
	Don't be shy to ask for help…	People suffer because they do not ask any help or do not explain their problems to subordinates .If they get used to ask for reasonable favours from their subordinates it will make the life and work easier for them. This will make the working environment more likable for everyone.
	Relax…..there is a world around you…	People have become more machinery with the open economy and they strive to have money .They forget about the natural beauty around them and end up with diseases where they will not able to enjoy the same life afterwards. This message transfers the knowledge that they have to think about the future while earning money. This encourages people to take some time off from their work and refresh their life with natural beauty in the world which relaxes them.
Students or children	Enjoy the nature; you are part of it…	Children should be taught from the childhood that they are a part of this environment and they are not superior to the Mother Nature. If they get used to that feeling and able to admire the surrounding they will get used to do the same when they become adults. This feeling if they carry out through out their

		life it will help them to manage the stress they face later in life.
	Nature colours your life …	Children and students should be familiarized with the environment around them and taught how to see, admire and feel the nature. If
		this exercise is inculcated in to the lives of the youngsters it will help them later in life to relax them. This attitudinal change will be an investment for the future.
	There are many ways in life to reach your dream…	With the parental pressure children are forced to perform well in education and to pass examinations to get good jobs. But most of the time they think on the traditional line and become failures in later life. If you allow children to be more independent and creative they may be more successful in life and less stressful.
	Childhood is precious …it comes once a lifetime…	Children are subjected to the same rat race of their parents and forgotten about their childhood. This message tries to remind them that they have to enjoy the childhood as it develops a complete man in later life. It gives a person enough experience in the later life to tackle the problems he/she faces.

c. MYTHS

- Smoking and alcohol relaxes oneself ….

  There is a belief in the society that by taking alcohol and tobacco the mind can be relaxed when a person is confronted with problems. Thus it has been carved in to the minds of the younger generations and has lead to loss of inner peace in individuals and families.

- Money always brings you happiness …

  People believe that more money brings more happiness and they are reluctant to share resources which have not been the case especially in the villages before the open economy era. People were brought up in the Buddhist philosophy which teaches them the middle path in the life and sharing.

8.4.4 INDICATORS

The practical way of assessing the stress level of an individual is to subject them to a questionnaire which includes most of the dimensions of stress in the life (**Table 8- 6**). Again it is important that the questions should be formed in such a way that it can be used in the health setup for monitoring the change in the individuals after the interventions.
The following questions were made keeping that in mind and using the dimensions described by Allen Cameron, charted psychologist in UK for stress assessment questionnaire. Only the dimensions deemed appropriate for the purpose of monitoring is considered.
The questions should be adapted to local conditions and should be validated by a panel of experts. A composite score obtained following

answering the questionnaire should be compared after three months for the monitoring purposes. Questions are made only for step 1.

TABLE 8- 6: EXAMPLES OF QUESTIONS TO MONITOR STRESS

Question	Answers (encircle the number)	Rationale
[Job satisfaction] **Q1: I am dissatisfied with my job**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	Stress arises from work related factors. Therefore this question try to asses weather the person is affected because of stress. It may be one reason or few reasons as discussed in the problem analysis.
[Relationships] **Q2a: My relationships with my family seem strained** **Q2b. My relationships with friends seem strained**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	Individuals suffer due to difficulties they encounter in communicating with their family members and immediate relations and friends leading to stress.
[Responsibility] **Q3a: I am not happy being a parent** **Q3b. I do not enjoy being a student**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	Parenting and family daily chorus brings stress to certain individuals as they are not organized or lack support they need from the society and the immediate family members.
[Incidents] **Q4: A critical life event (e.g. divorce, death, shifting house) within the last 6 months has adversely affected me**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	This is to measure the stress caused by critical events in the course of life. Individual has to imply how far it affected him.
[Emotional] **Q5: I feel that I am losing control over my emotions frequently.**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	Coping skills of emotions of a person really depend on the life skills of the individual has. It might lead to persistently high stress on the person.
[Psychological] **Q6: I have difficulty in concentrating on my day-to-day work/studies**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	If a person feels tired, works less efficiently, has difficulty in concentrating often and that can be considered as individual is subjected to stress.

[Physical] **Q7: I often suffer from headaches, aches/pains or sleeping difficulties**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	When a person is subjected to stress constantly he gets unexplained signs and symptoms like headaches, indigestion and excessive sweating as a result.
[Social support] **Q8: I do not like to discuss my problems with others**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	When people share their problems with others or talks through their problems they feel less stressed in life.
[Health] **Q9: Recently I have difficulty in maintaining weight**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	If a person maintain a healthy weight, eats healthy food and drinks moderately it shows that the person is under less stress.
[Distraction] **Q10: I rarely take time off to relax**	Not at all Little Average Somewhat Very much 0 1 2 3 4 5 6 7 8 9 10	If a person takes time off routine work to relax and enjoy the life he feels relaxed and less stressed.