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Report on the

REGIONAL WORKSHOP ON THE PREVENTION AND CONTROL OF OBESITY

Manama, Bahrain, 28–30 November 1999

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1. INTRODUCTION

A regional workshop on the prevention and control of obesity was organized by the World Health Organization's Regional Office for the Eastern Mediterranean in collaboration with the Ministry of Health of Bahrain, at Manama, from 28–30 November 1999. The workshop was attended by representatives from 15 Member States, technical experts from the International Obesity Task Force and the National Heart Foundation of New Zealand as well as staff members from WHO headquarters and regional offices.

A welcome message from Dr Hussein A. Gezairy, WHO Regional Director for the Eastern Mediterranean, was read by Dr Anna Verster on his behalf. Dr Gezairy welcomed the participants and guests to the regional workshop on prevention and control of obesity. The workshop was the first of its kind and was held in Manama, Bahrain, reflecting the Government's interest in the problem of obesity and its development of an effective programme for controlling and preventing obesity.

In his message, Dr Gezairy said that obesity was a health problem in its own right and was a risk factor in the development of diabetes and cardiovascular disease. Cardiovascular diseases had become the major cause of death in most if not all countries of the Region. WHO estimated that there were currently around 16 million diabetics in the Region. This figure was expected to rise to almost 43 million by 2025. Surveys carried out in the Region showed that diabetes was much more prevalent among city dwellers than among people in rural areas.

However, over the last 40 years with the discovery of oil, the lifestyle in most countries of the Region had been transformed. More than 80% of the population lived in cities. Physical exercise had become a leisure activity, people had air-conditioned cars and bought their food from supermarkets. Along the same lines, dietary habits had undergone a major change as well. Fat consumption had soared, fast food outlets were found everywhere and most inhabitants of the Gulf Cooperation Council countries reportedly had processed foods at every meal. Overweight and obesity affected more than half of adult women, according to the information available. And much of the obesity in men, although less documented, seemed to be of the abdominal variety, which carried the highest risk of cardiovascular morbidity and mortality.

Dr Gezairy cautioned that the problem of obesity, however, was not confined to the more affluent countries or the more affluent segments of society. Studies previously carried out in Egypt showed that obesity was more prevalent among the urban poor than among the economically affluent. The urban poor had less access to fresh fruits and vegetables, ate more fat and sugar, lived in more crowded and unhealthy conditions and were also subject to severe stress brought about by their marginal situation. They were therefore not only prone to obesity but also suffered the additional risk of noncommunicable diseases. The current hypothesis that stunted growth in childhood may predispose one for later obesity and noncommunicable diseases implied that the countries in the Region that were still suffering from high prevalence of malnutrition and battling with the burden of communicable diseases may face an epidemic of obesity and

noncommunicable diseases in the near future. This had been called the double burden of disease. It was growing, and, if unchecked, would engulf these countries.

Dr Gezairy said that his talk had so far painted a bleak picture of the situation, showing the risks facing countries of the Region, which would be discussed at the workshop. But as the title of the workshop was 'The Prevention and Control of Obesity, strategies would also have to be developed to address the problem. The Regional Office with its collaborating partners had brought to the workshop a number of experts from countries around the world where new approaches were being tried. These new approaches attempted to address not only the dietary behaviour of individuals but to change their whole environment and come up with strategies to alter the way of life of entire populations. Strategies had been developed to make physical exercise the norm, rather than the exception, and enable people to change their lifestyles to become healthier.

Obesity started young, Dr Gezairy commented, and was being seen more and more among children under 5 years in the Region; by school age, many children were already becoming obese. This, however, was the age where lifelong habits were formed and where behaviour could still be influenced.

In concluding, Dr Gezairy wished the participants success and challenged them to develop strategies to address the way of life of future generations and to adapt the experiences of colleagues from other regions to suit the social and cultural realities of this Region and individual countries.

H.E. Dr Faisal Radhi Al Mousawi, Minister of Health, Bahrain, then welcomed the participants to Bahrain. Dr Al Mousawi said that in the Holy Quran, God said: *Eat and drink and do not be excessive; God does not like the excessive.* The practices and directives of the Prophet Mohammed ﷺ consolidated this advice and emphasized its importance. Among the prophetic hadiths were the sayings "A human being can fill no worse vessel than his [her] stomach" and "The stomach is the abode of sickness, and diet is the main part of the cure".

Good health, said Dr Al Mousawi, involved more than simply the absence of disease. It indicated a state of complete physical, mental and spiritual well-being and required the presence of a number of factors, which, taken together, protected the body from diseases. Some of these factors were hereditary, while others related to the body's resistance, developed through a healthy lifestyle and the food and drink people consumed.

One of the major causes of disease, which could easily be avoided, was obesity. Unfortunately, Dr Al Mousawi indicated, obesity had become widespread in communities in several parts of the Region. It endangered the health of many individuals, who had fallen victim to numerous chronic diseases, such as diabetes, cardiac diseases, circulatory diseases and various types of cancer.

In Bahrain, obesity had now reached 28% among adult women and 36% among men. According to the 1998–1999 statistics, around 36% women (aged 19+) suffered from

obesity. This high number, said Dr Al Mousawi, constituted a community health problem. Recent Ministry of Health statistics indicated that 32% of deaths could be attributed to cardiac and circulatory diseases and 10% to cancers. For these reasons, obesity was regarded as a health problem, reflecting certain socioeconomic, mental and cultural characteristics. With its various types and treatment methods, obesity was very complex.

To promote health and self-control, the checking of dietary excesses and refraining from harmful foods were necessary. The body was the product of what it consumed and obesity reflected living patterns. Its epidemiology mirrored the environment and the nature of people's responses to events. Due to its increasing epidemiology, obesity had become known as 'the disease of our times'. It endangered human health and adversely affected national economies and production. People nowadays ate foods that were high in fat and low in fibre, smoked heavily and took little exercise. Following such a lifestyle often resulted in death.

In conclusion, Dr Al Mousawi invited the participants to thoroughly discuss this serious issue, in order to develop a joint regional strategy to serve as a guideline to control, contain and solve the problem. He once again thanked the national representatives for participating as well as organizers for all their efforts. He said their contribution would be a positive addition to the literature on the prevention and control of obesity.

Ms Nadia Gharib was elected as the Chairperson for the workshop. The agenda and programme of the workshop and the list of participants are provided in Annexes 1, 2 and 3, respectively.

2. GLOBAL PROBLEM OF OVERWEIGHT AND OBESITY

Dr Chizuru Nishida, WHO/HQ, Geneva

Dr Nishida began her presentation by defining Body Mass Index (BMI), a simple index of weight-for-height commonly used to classify overweight and obesity in adults. It is calculated as the weight in kilograms divided by the square of the height in metres (kg/m^2). The BMI values are age-independent and the same for both sexes. However, BMI does not correspond to the same degree of overweight for different populations due, in part, to different body proportions. Therefore, additional measurements such as waist circumference and waist-hip ratio should ideally also be used to assess obesity.

In 1997, a WHO expert consultation on obesity[1] reiterated the BMI classification of overweight and obesity as shown in Table 1.

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[1]WHO. *Obesity: preventing and managing the global epidemic. Report of a WHO Consultation on Obesity. WHO/NUT/NCD/98.1* .Geneva, World Health Organization, 1998 (This is an interim version of the report. The final version will be published in the WHO Technical Report Series).

Table 1. BMI classification of overweight and obesity

Classification	BMI (kg/m^2)	Risk of co-morbidity
Underweight	<18.5	Low (but risk of other clinical problems increased)
Normal range	18.5–24.9	Average
Overweight	≥25	
Pre-obese	25–29.9	Increased
Obese class I	30–34.9	Moderate
Obese class II	35–39.9	Severe
Obese class III	≥40	Very severe

This table shows a simplistic relationship between BMI and risk of co-morbidity, which could be affected by a range of factors, including nature of the diet, ethnicity and activity level. It should also be noted that the risks associated with increasing BMI are continuous and graded and the interpretation of BMI grading in relation to risk differs for different populations.

Although the BMI cut-offs are defined, global data on overweight and obesity for adults are not well established. In WHO, a process was started recently to refine the global database on BMI.

Despite the limited availability of nationally representative data, particularly secular trend data, the following facts are clear.

- Obesity is a complex, multifaceted disorder.
- Obesity is prevalent in both developing and industrialized countries.
- In many countries, especially developing countries, obesity co-exists with undernutrition.
- Obesity affects children and adolescents, as well as the adult population.
- More women have become obese than men, while there is a higher proportion of overweight men than overweight women. Part of the explanation for that might be biological, since women start with a greater amount of body fat and hence become obese more easily.
- Obesity is a major risk factor for serious noncommunicable diseases, such as cardiovascular disease, hypertension, stroke, diabetes mellitus and various forms of cancer. In 1997, WHO estimated that, of approximately 52 million deaths worldwide (12 million in industrialized countries and 40 million in developing countries), about 30% were due to infectious and parasitic diseases (i.e. acute lower respiratory

diseases, tuberculosis, diarrhoea, HIV/AIDS and malaria). Over 40% were due to circulatory diseases (i.e. coronary heart diseases, cerebrovascular diseases) and cancers.

- It is projected that by 2025 approximately 60% of deaths worldwide will be caused by circulatory diseases and cancers. This evidence suggests that the prevention and control of the problem of obesity need to be taken very seriously in both industrialized and developing countries.

3. CURRENT INFORMATION ON OVERWEIGHT AND OBESITY IN THE REGION

Dr Timothy Gill, Rowett Research Institute, Scotland, United Kingdom

Tackling overweight and obesity in the Region will require coordinated action at regional, national and local levels. Comprehensive strategies are needed both for prevention of population weight gain and for management of individuals with existing weight problems. The International Obesity Task Force (IOTF) has developed a process to help countries formulate their own prevention and management strategies which take into account local needs and build upon existing initiatives. The diagram below is an outline of the overall model and sets out the important steps in this process of policy development.

A key step in this process is a comprehensive analysis to provide an indication of the current state of overweight and obesity. This requires collecting information about the true extent of the problem within each country or region in order to provide a basis for arguing for a high level of action on this problem. It is important to collect as much data as possible about all aspects of the obesity problem, as set out in Figure 1.

The information collected at this stage should be sufficiently detailed to provide an indication of the severity of the problem and some of the major factors contributing to it. More detailed analyses could be conducted at later stages of the process, where necessary, e.g. surveys could be set up to collect information, but it is important that this does not hold up the process.

To assist with the assessment of current overweight and obesity in the Region, a detailed questionnaire was circulated to all workshop participants. The questionnaire sought to collect information on all the elements set out in Figure 2.

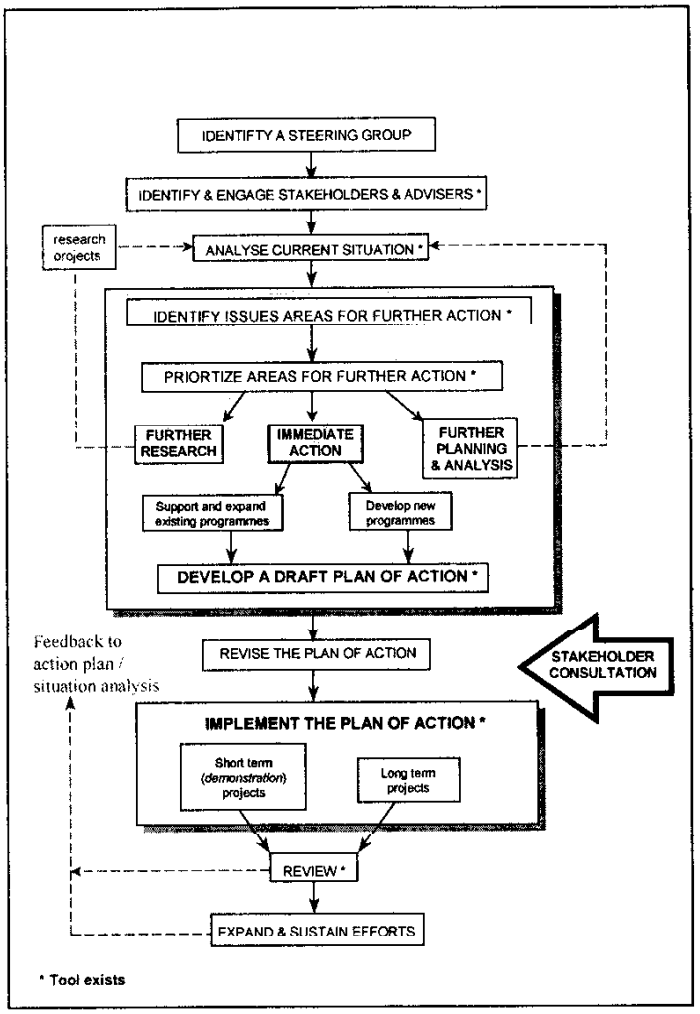

Figure 1. Developing a comprehensive action plan for prevention and management of overweight and obesity

Population weight status

Obesity can be defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired'. (WHO 1998). However, measuring body fat stores is difficult and expensive and so surrogate measures of fatness such as BMI are used to assess the population weight status. Waist and waist/hips circumference have also been proposed as useful indices of abdominal obesity and have been closely linked to co-morbid illnesses such as diabetes, coronary heart disease and hypertension.

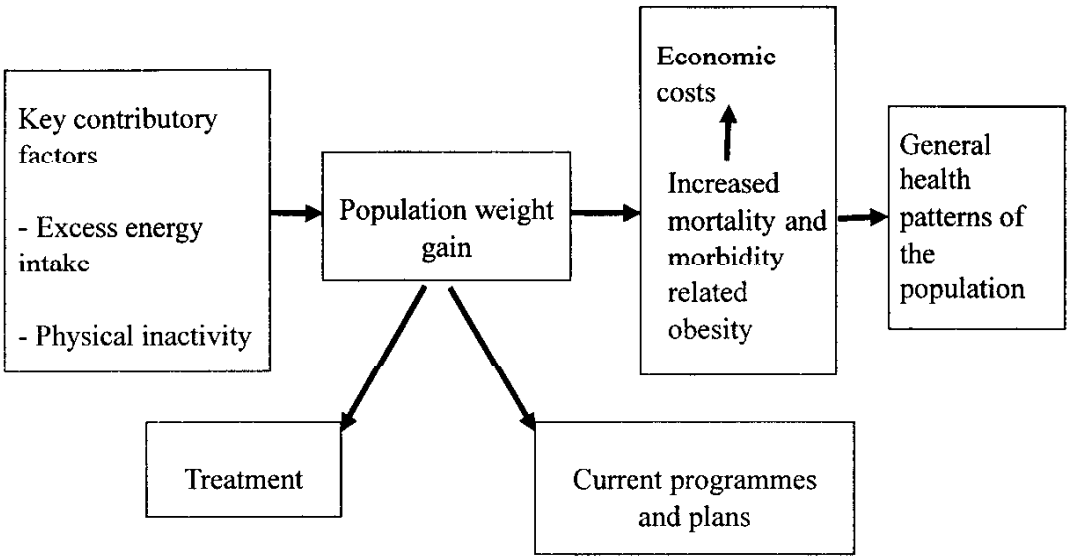

Figure 2. Key elements for the situation analysis

Not all countries in the Region have nationally representative data on the level of overweight and obesity and, where data are presented in the questionnaire, there are inconsistencies in the way the information has been collected and presented. Variations in age ranges, time period of collection, classifications of obesity used and standardization of data make direct comparisons between countries difficult. However. the information on levels of overweight and obesity does give an indication of the extent of the problem throughout the Region. Apart from Pakistan, most countries in the Region have levels of adult overweight greater than 60%, and in some cases close to 80% of adults are overweight or obese. Obesity rates also vary but approach 40% in adult females in some countries

3.1. Variations in weight status within countries

There are a number of consistent trends in the reported levels of obesity in all countries. In most countries in the Region the level of obesity is much higher among females than males, although the level of overweight is often similar among males and females. There are biological reasons that partly explain the greater deposition of fat among females but there may also be societal and cultural factors which contribute to greater weight gain among females.

There are also clear differentials between levels of overweight and obesity in rural and urban areas. (See Figure 3). At present, rural living is still associated with more activity and limited food availability, but this is changing, as many countries become more affluent.

There are consistent increases in both mean BMI and the level of obesity with age throughout the Region. (See Figure 4). This is seen in almost all regions of the world but peak weight occurs quite early in life in many countries of the Region (the mid-thirties in Oman and Bahrain, compared to the late fifties in many European countries). This is significant because it means that a large proportion of the population is exposed to biological stress caused by obesity for long periods of their life which will likely result in higher rates of diabetes and other illnesses associated with excessive weight.

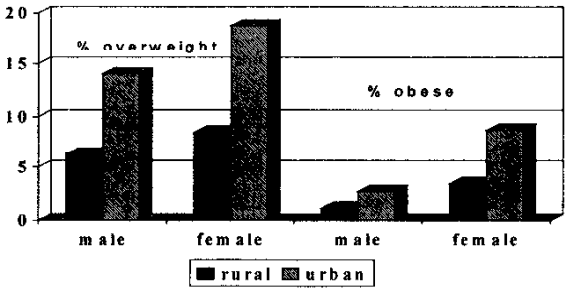

Figure 3. Percentage of overweight and obese adults in Pakistan in rural and urban areas

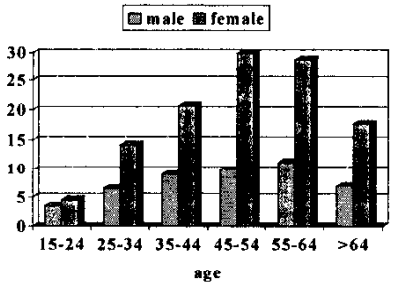

Figure 4. Prevalence of obesity (BMI>30) with age in the Islamic Republic of Iran

3.2. Population mean BMI

The population mean BMI provides a valuable tool for assessing changes in the weight status of the population. There is a clear relationship between mean BMI and the level of obesity in a population. When the mean BMI is below 23 there are few individuals with a BMI>30, but once the mean rises above this figure the level of obesity grows quickly. Once people become obese, they are likely to remain obese for the rest of their lives and therefore strategies aimed at controlling obesity are not likely to show any meaningful reduction in the prevalence of obesity in the community. In addition, populations with low mean BMI at present will not show substantial increases in obesity rates when the community first begins to gain weight.

Therefore, preventing increases or even reducing the population mean BMI may be more useful in assessing the impact of community prevention and intervention programmes. However, the levels of overweight and obesity are still useful for indicating the extent of the problem to the general community and policy-makers.

3.3. Overweight and obesity in children

Very few countries have presented data on obesity rates in children. This is partly due to the lack of an acceptable standard for assessing weight status in children. At present the relative weight for age charts from the National Council for International Health (NCIH) in the USA are the most common tool for assessing childhood overweight and obesity, but different countries used different cut-off points (with a Z score deviation ranging from 2–3 points from the median percentile of these charts). BMI-versus-age charts with cut-off points independent of current distribution and based on an international reference population are being developed by the IOTF. Interim charts will soon be published in the *British medical journal* and may prove useful for undertaking these assessments in a more consistent and relevant manner.

3.4. Obesity-related illness and premature death

Obesity is associated with a wide range of illnesses and conditions that affect the general health and well-being of the population. A number of these factors are presented in Table 2. Data collected on the level of obesity-related illness generate indicators to determine the extent of the impact of obesity on the current health of the population.

The level of type II diabetes is an important indicator of obesity-related health. A large proportion of type II diabetes can be attributed to obesity and together with hypertension they are the early symptoms of increased population weight. Diabetes is also a very expensive condition to treat and presents a huge burden to healthcare systems for the rest of the diabetic's life. It is therefore alarming to find the levels of diabetes reported among countries of the Region are already well above what is reported in European countries. Table 3 shows figures from scattered studies throughout the Region. It shows that the occurrence of diabetes in many countries ranges from 4%–10% of all adults and is even as high as 35% in certain age groups.

Table 2. Relative risk of health problems associated with obesity in developed countries

Greatly increased (relative risk >3)	Moderately increased (relative risk 2–3)	Slightly increased (relative risk 1–2)
Diabetes	Coronary heart disease	Cancer (breast cancer in postmenopausal women, endometrial cancer, colon cancer)
Gall bladder disease	Osteoarthritis (knees)	Reproductive hormone abnormalities
Hypertension	Hyperuricaemia and gout	Polycystic ovary syndrome
Dyslipidaemia		Impaired fertility
Insulin resistance		Low back pain
Breathlessness		Increased anaesthetic risk
Sleep apnoea		Foetal defects arising from maternal obesity

Table 3. Prevalence of diabetes in a selection of countries in the Region

Country	Age group	Prevalence of diabetes (%)		
		Male	Female	Total
Bahrain	50–59	29	35	
Egypt	>20			4.9
Jordan	>25	6.9	6.6	
Lebanon	All ages	3.4	3.9	
Morocco	>20			9.5
Saudi Arabia	14–70	9.5	6.8	
Tunisia	NA			12.6

NA: Information not available

3.5. Diet and physical activity behaviours

Many countries are already collecting data on the dietary habits of their population but few countries have conducted recent representative national dietary surveys. Only one country reported any national physical activity data and this was a crude questionnaire assessment.

The key dietary behaviour that has been implicated in population weight gain is the excess intake of fatty, high-energy foods. There is evidence to support the role of fat in the development of obesity from a range of different sources. In response to specific questions in the questionnaire most countries report a trend of increasing fat intake over the last few decades with current reported fat intakes ranging from 10% in Pakistan to 42% in Kuwait. Only Egypt reports a reduction in percentage energy from fat in recent years but this is slight and was from a very high fat intake initially (43%). Other important changes consistently indicated in the questionnaire include an increased intake of fast foods, sugar and snacks, together with a reduction in the consumption of vegetables.

These changes are supported by food balance sheets available in some countries. In Bahrain, over 90% of foods eaten are imported and therefore food balance sheets are an accurate reflection of food available in the country. Table 4 shows a large increase in intake of vegetable oil between 1970 and 1984, which is associated with a reduction in potato and cereal intake.

Table 4. Annual per capita consumption of various food products in Bahrain, 1970–1984

Food	1970–1972 (kg)	1982–1984 (kg)	% Change
Cereal (total)	148.8	161.9	+8.8
Wheat	68.2	63.1	-7.5
Rice	72.7	63.7	-12.4
Potatoes	25.7	18.4	-39.7
Pulses	4.8	7.1	+47.9
Vegetables	42.7	108.5	+154.1
Fruit	111.2	115.1	+3.5
Sugar	26.4	31.0	+4.5
Vegetable oils	1.6	18.9	+1081.3
Red meat	22.6	39.8	+76.1
Chicken	7.7	29.4	+281.8
Fish	3.2	18.2	+468.8
Eggs	7.1	13.2	+85.9
Milk	43.3	186.9	+331.6

Source: Adapted from the Arab Organization for Agricultural Development (1987)

Most participants indicated that many people do not take enough exercise and this contributes to obesity. The participants also identifed a number of obstacles to taking more exercise (Table 5).

Table 5. Main factors leading to reduced physical activity

Factor	Number of times cited
Improved transport	7
Home facilities	7
Sedentary work	5
Passive entertainment	7
Cultural factors	4
Not accustomed to exercise	8
No safe and convenient exercise facilities	4
Lack of exercise promotion	7
Other (e.g. hot weather)	1

3.6. Current services and programmes

Currently only four countries report having some coordinated programmes to prevent and control obesity and five have some form of physical activity strategies. However, only two countries have comprehensive services for the treatment of obese people.

Respondents were asked to nominate which action areas they believed would be useful and which actions feasible in their countries. Most respondents indicated that education strategies and changing school curricula would be useful and feasible, but policy-making and environmental and economic action were less popular. (See Table 6).

Table 6. Areas of action for the prevention and control of obesity

Action	Useful	Feasible
Urban design	8	7
Transport policies	4	2
Laws and regulations	4	4
School curricula	16	16
Economic incentives	2	3
Catering standards	9	7
Promotion and education	16	16
Family food production	9	9

4. THE ECONOMIC COSTS OF OVERWEIGHT AND OBESITY

Dr Timothy Gill, Rowett Research Institute, Scotland, United Kingdom

Determining the economic cost of obesity is an important activity which can highlight the true impact of the obesity problem for policy-makers in a language they understand–money. It also allows an assessment of how resources are currently being applied in the management of obesity, indicates what will happen if no action is taken to control the problem and provides a baseline for assessing the impact of future interventions.

However, it is important to understand that calculating the costs of obesity does not tell us whether there would be any benefit in intervening. The effectiveness of intervention and its benefit to health must also be calculated, as well as the cost of each intervention/programme.

Unfortunately data concerning the effectiveness of most proposed interventions (particularly prevention programmes) are not available at the moment and can only be estimated. There is still value in calculating how much obesity may cost as it is a useful advocacy tool but it is important to understand and accept the limitations of only one side of the cost/benefit equation.

The costs of obesity are usually divided into three components.

- direct costs: health care resources for the management of obesity and related illness
- indirect costs: loss of economic activity due to illness and premature death associated with obesity
- intangible costs: social and personal loss (health, well-being and premature death) associated with obesity and its related illnesses.

Most assessments of the costs of obesity only concentrate on direct economic costs and sometimes include indirect costs associated with well-defined costs of sick leave from work and disability pensions. However, more attention has recently been given to the issue of intangible costs where the impact of premature death and a reduction in the quality of life of individuals and groups who suffer the social and physical consequences of being obese are involved. Recent analyses from the World Bank and WHO have used disability-adjusted life years (DALYs) as a way of quantifying this. The IOTF is developing a technique for calculating the costs of obesity and will be publishing a document outlining this process for both direct/indirect costs and intangible costs. The steps in the process are as follows:

- identifying illness attributable to overweight and obesity
- identifying cost categories to be included in analysis, i.e. direct, indirect, intangible
- measuring the health care and non-health care impact of obesity-associated illness
- quantifying the relationship between obesity and illness (using population attributable fraction)
- estimating the total cost for specific illnesses associated with obesity.

A key issue in calculating the costs of obesity is determining how much of each weight-related condition can be directly attributed to obesity in a specific population. This is termed the population attributable fraction (PAF) and is a product of the relative risk of each condition related to obesity and the prevalence of each condition in the population. PAF is calculated as follows, where p = prevalence and RR = relative risk:

$$PAF = [p (RR - 1)] / [p(RR - 1) + 1]$$

There are a limited number of studies which have attempted to calculate the costs of obesity, most of them concentrating on the direct costs of obesity only. However, there has been no consistency in the number of obesity-related conditions included in these calculations or agreement on the PAFs used. As a result many of these estimates are very conservative but still clearly indicate the huge financial burden of obesity on society. (See Table 7).

Table 7. Conservative estimates of the direct health care costs of obesity

Country	Year	Estimated direct costs	Percentage of national health care costs
Australia	1989–1990	AUD 464 million	>2%
Canada	1997	CAD 1.8 million	2.4%
France	1992	FRF 12 billion	2%
Netherlands	1981–1989	NLG 1 billion	4%
New Zealand	1990–1991	NZD 135 million	25%
United States	1995	US$ 52 billion	5.7%

5. PROPOSED EMRO MODEL FOR PROMOTION OF HEALTHY LIFESTYLES

Dr Ahmed Abdel Latif, Regional Adviser, Healthy Lifestyles, WHO/EMRO

Dr Abdel Latif reported that the Region is witnessing social, demographic, technological, epidemiological and economic changes and challenges. Among the 23 countries of the Region, five are considered as least-developed countries (LDCs). In all the Member States, social, economic, environmental and biological (genetic) factors influence health, as well as the extent and patterns of disability, morbidity and mortality. In addition, changes in culture and technology in developing countries have also caused rapid changes in the lifestyles of people, thereby increasing the incidence of chronic noncommunicable diseases. An increase in obesity is one striking resulting of social, economic and educational changes. The burden is expected to be even greater in the future.

Obesity normally depends on a variety of complex and synergistic factors or determinants that operate at the individual, household, community, national and even global levels. They include predisposing factors such as knowledge, attitudes and practices (particularly at the individual level); enabling factors, relating to family and peers, which contribute to the increasing risk of becoming obese; reinforcing factors which relate to prevailing or non-prevailing policies, legislation and fiscal control which indirectly or directly affect the increase in the prevalence of obesity. (See Figure 5).

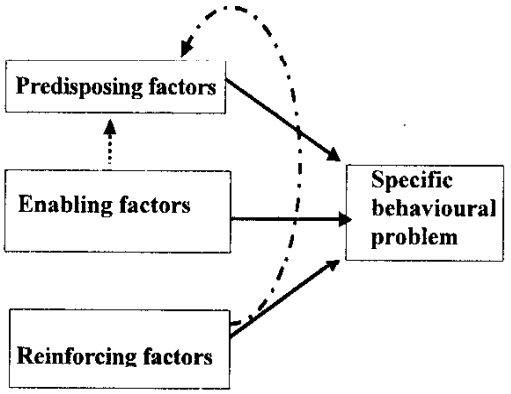

Figure 5. Factors affecting obesity

Thus, in developing health promotion (which includes policies, health education and prevention) programmes to address obesity, it is important to see obesity as a product of specific environmental and behavioural factors and not solely as a medical problem of individuals.

The model presented by Dr Abdel Latif emphasizes the notion that health promotion is a process enabling people to increase control over and improve their health. Figure 6 depicts two main approaches to health promotion, the personal and the developmental, which can easily be applied to obesity as an undesired nutritional state. The developmental approach emphasizes the social components of creating health-enabling and reinforcing conditions.

In this approach the entry point is creating an environment conducive to healthy lifestyles and behaviour. This environment is created by addressing the macro-physical and biological determinants such as policies regarding poverty alleviation, education, food, mass media, etc. This physical and biological environment will then affect the sociocultural system and in the long term bring about healthier habits and behaviour through natural healthy choices and a preference for a healthier lifestyle, physical fitness and good nutrition. All of these factors are relevant to reduce the problem of obesity in a sustainable way.

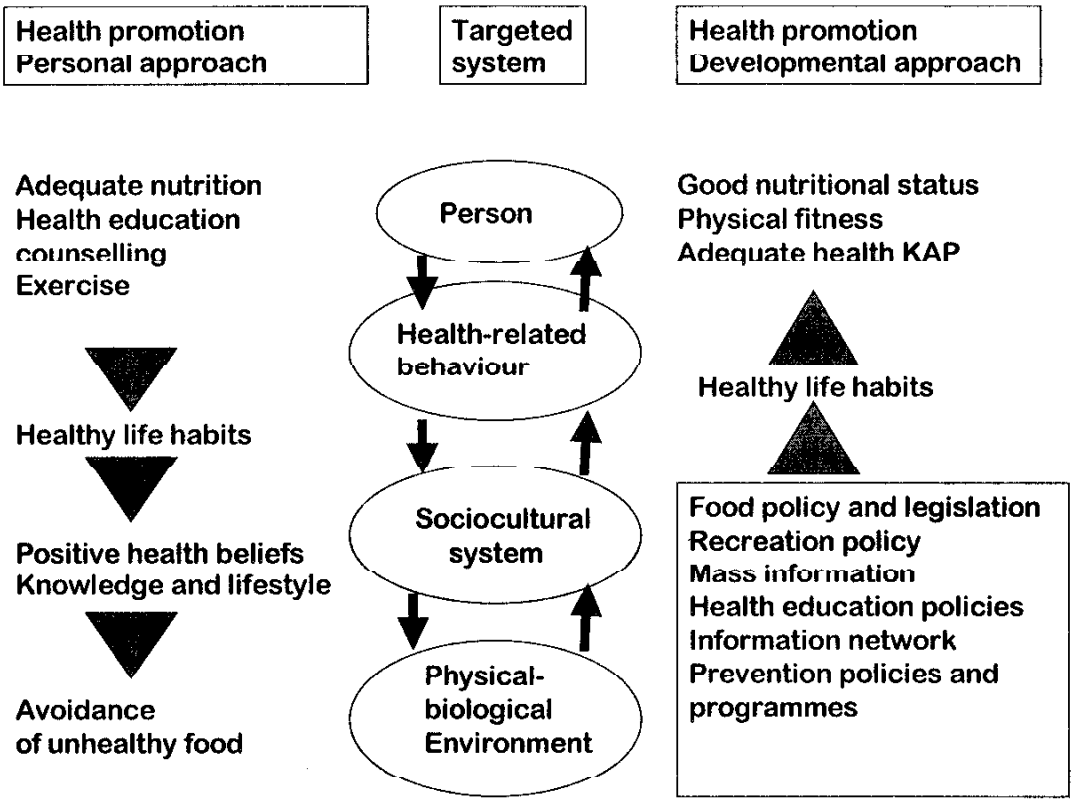

Figure. 6. The personal and developmental approaches to tackling obesity

The other approach referred to is the personal or individual approach. In this approach the individual's knowledge, attitude and practices should also be used as entry points to change his/her risk-taking practices and to cope with requirements for healthy living. The individual approach also demands that the individual change his/her sociocultural and physical–biological environment to become healthier and health-promoting. However, it is to be noted that the two approaches are not mutually exclusive. The right blend and timely introduction of both are important to ensure synergy of the two approaches. In sum, health is a resource for everyday life, where to be healthy is a merit on its own, in addition to its other benefits.

6. PREVENTION AND CONTROL OF OBESITY (1)

Dr Anna Verster, Regional Adviser, Nutrition and Food Safety, WHO/EMRO

Countries in the Region vary widely according to income. Some countries are listed as LDCs while others have a GDP per capita of over US$ 10 000. The nutrition problems in the Region fall into two categories:

- deficiencies: protein, energy, iodine, iron, vitamin A, zinc, vitamin D and vitamin C
- imbalance due to excessive intake: obesity, diet-related chronic diseases (such as cardio-vascular disease, cancer, non-insulin-dependent diabetes mellitus)

Dr Verster presented a possible framework for looking at obesity as the outcome of a number of interactive processes; reviewing the current approaches; trying to look beyond the individual; identifying new strategies; and developing specific regional and cultural plans.

Protein consumption remains uniform across the different categories of per capita GDP (in US$), so there is always a similar amount of energy from protein in the diet. However, the proportion of energy generated by fat consumption increases proportionately as per capita GDP increases.

In the framework shown in Figure 7, biological and physiological states related to obesity include the following:

- genetic cause of BMI and fat distribution
- genetic risk of becoming obese
- poor appetite-control mechanism
- physiological state
- sex
- ethnic groups in 'new environments'
- protein energy malnutrition in childhood.

It must be noted that stunting is still widespread in countries of the Region.

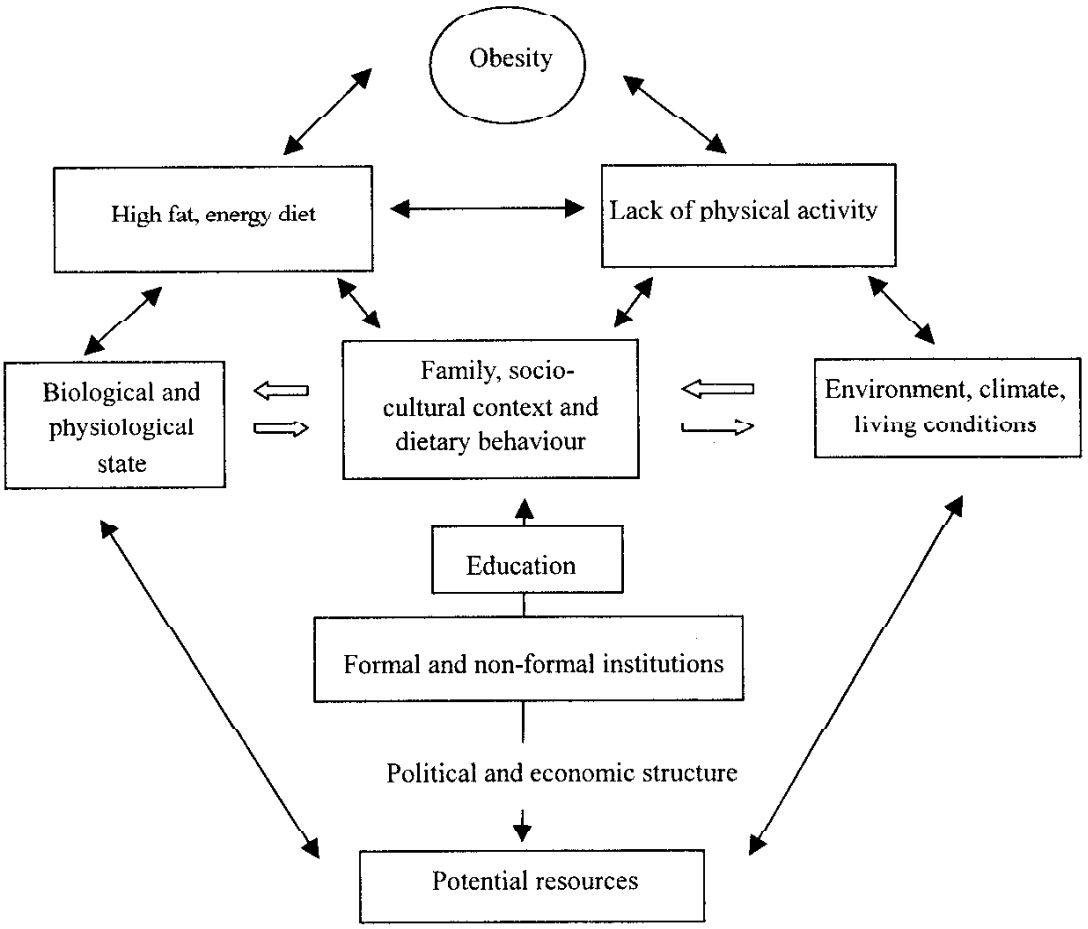

Figure 7. Potential resources for dealing with obesity

Family, sociocultural context and dietary behaviours include: family habits, as these form children's habits; use of food as reward; perception of obesity; cultural influences; religious guidance; hospitality; and eating together.

Environment, climate and living conditions include: changes in food availability; international trade; changes in transportation; urbanization; labour-saving devices; changes in working conditions; and changes in living conditions.

Over the years several activities have been undertaken to address the problem of excessive and unbalanced nutrition. WHO has developed population-based nutrient goals (Tables 8a–8b); FAO/WHO have held consultations on food-based dietary guidelines; and WHO has held a consultation on 'obesity – preventing and managing the global epidemic'.

Table 8a. WHO population-based nutrition goals (% of daily calories)

Dietary components	Quantity (%)
Total fat	15–30
Saturated fat	0–10
PUFAs[1]	3–7
Total protein	10–15
Total carbohydrates	55–75
Complex carbohydrates	50–70
Free sugars	0–10

[1] Polyunsaturated fatty acids

Table 8b. WHO population based nutrition goals (g/day)

Dietary components	Quantity (g/day)
Dietary fibre	16–24
Fruits/vegetables	>400
Pulses/nuts/seeds	<69
Dietary cholesterol	0–300

Clearly, in the past, overall action has centred on dietary behaviour modification: telling people what to eat; what to eat most or least of; suggesting serving sizes; and advocating reduction of fat consumption. Food-based dietary guidelines have been developed in many countries. However, the effect of all this has been disappointing.

Dr Verster stated that it is high time to look at 'energy out', not just 'energy in', i.e. dietary intake. She challenged the participants to look at ways of modifying lifestyles, offering people healthy choices, whether in eating or physical activity, and to do so in the cultural and climatic context of the Region.

6. PREVENTION AND CONTROL OF OVERWEIGHT AND OBESITY (2)

Dr Boyd Swinburn, WHO Temporary Adviser, Medical Director, National Heart Foundation, Auckland, New Zealand

6.1 An environmental audit approach

This presentation, which explains the environmental approach, has three objectives:

- to understand the need for a strong environment component in obesity prevention and the place of environmental scans, audits and interventions in the overall prevention process

- to define the appropriate behaviour, setting and sector for scanning

- to practise scanning environments for potential interventions and prioritizing the elements into a manageable list.

In the gene–environment relationship using the BMI distributions, it is found that while Environment 1 promotes leanness, Environment 2 promotes fatness. Similarly, individual A will be genetically lean and individual B will be genetically fat.

A figure indicating BMI and diabetes incidence was presented, based on work carried out by Colditz and published in 1990 (*American journal of epidemiology*, 1990, 132: 501–13). It was shown that the relative risk for diabetes goes up as the BMI crosses 24. Relative risk approaches 60 when BMI crosses 35.

The obesity epidemic is encountered most in middle-aged women, followed by middle-aged men, then adolescents and least in young children. Obesity is reported in both males and females in the upper socioeconomic stratum. It later affects males in the upper socioeconomic stratum as well as males and females in the lower socioeconomic stratum at the full-blown stage. In countries showing economic transition, obesity co-exists with under-nutrition. (Under-nutrition in early life + over-nutrition in later life is the worst combination).

There are two key options for obesity reduction: treatment, which is the high-risk approach; and prevention, which requires the population-based approach.

The environmental approach may be characterized by a number of aspects:

- addressing the driving forces of the epidemic
- population-wide effects implying true prevention
- systemic and long-lasting
- provides people with opportunities rather than telling them what to do
- reduction in the risk of messages being misinterpreted
- complements the high-risk approaches.

The three key areas for action are:

- social and economic determinants; very important and determined by wider government policies
- public education; energy intake encompassing energy density of food, fat, sugar, average portions; and energy output encompassing exercise, physical activity and inactivity
- environmental intervention; often overlooked.

Definitions of terms used:

- *environment* – the sum of the influences that the surroundings and conditions of life have on behaviour
- *obesogenic* – promoting obesity

- *settings* – where people gather, e.g. schools, workplaces, houses, supermarkets, festive occasions
- *sectors* organizations, industries, bureaucracies, etc, which influence the settings, e.g. education system, food industry, media, health care systems, local government
- *elements* – parts of the environment that influence the behaviour in question (barriers or enhancers).

There are four types of environment:

- physical: extent of training, expertise, knowledge and information available
- economic: what budget is available, costs of goods and services, income and receiving costs
- policy: laws, regulations, formal and informal rules
- sociocultural: beliefs, attitudes, values, cultural norms, group ethics, perceptions.

6.2. The ANGELO framework

The ANGELO framework is an analysis grid for environments linked to obesity. Within each relevant sector and setting, four questions are asked about the types of environment and potential elements are entered into a table. The analysis could, for example, be of school food and active recreation (see Table 10).

Table 10. Information required for ANGELO analysis

Environment	Settings	Structure
Physical (what is available)		
Economic (income/costs)		
Policy (the rules)		
Socio-cultural (attitudes, values, beliefs, traditions)		

There are two key categories.

a) energy intake – home and festive food, catered (restaurants, functions, cafes, etc) food,-school and workplace food, food/nutrition knowledge

b) energy output – active and passive (television, videos, internet) recreation, physical activity at school and in the workplace, care versus active transport, incidental activity (mainly use of stairs), physical activity knowledge

Instructions for prioritizing the elements for intervention are as follows:

- Rate each element in importance for your country/culture (score 0–5)
- Rate each element on changeability; i.e. how likely we are to influence it (score 0–5)
- Avoid giving every element a top score; be discriminating
- Multiply the two scores together and rank.

In small island populations, there is the potential to assess and influence the obesogenic factors. In Torres Straits Islands, for example, the environmental and high-risk approaches to obesity can be studied. Focus groups will also define and prioritize environmental interventions.

Conclusions

- Environmental forces are driving the obesity pandemic, and focus on research and action is needed.
- The ANGELO grid is a tool for environmental scans and problem identification.
- The environmental approach to obesity prevention is in its infancy.
- There are lessons to be learnt from other epidemics – a comprehensive approach is needed.
- Ecological and other models explain obesity at individual and population levels.

7. GROUP WORK

7.1 Using the ANGELO approach in scanning for environmental barriers

The ANGELO framework is simply a tool to help scan the environment for possible barriers to increasing physical activity and making healthy food choices. The following need to be borne in mind:

- Once the list has been developed, a prioritization process will reduce it to a manageable number of areas for intervention or further investigation.
- To start the scan, check that the settings and local/regional/national/international sectors have been correctly identified.
- Brainstorm in a group in response to the questions in each box. (Several suggestions are given.)
- Don't be too concerned about which box the elements fall into: the main thing is to get the ideas down.
- Don't spend too much time on any one area; if the group can't think of anything, there is probably nothing major being missed.
- When you have finished, you can dispense with the grid. (It has done its job in getting you to think about all the key types of environments).

- Revisit the elements and make sure that they are properly written to capture the particular barrier or enhancer you want to identify.

- Continue by scanning each of the 'behaviour bits' identified (e.g. home food, school food, food/nutrition knowledge, etc).

- Next you need to prioritize the elements so that you end up with only the highest priority ones to deal with.

- Rate each element on 'importance' (how important this barrier is in this setting) from 0 (not important at all) to 5 (extremely important).

- Avoid the temptation to give every element a '5' because this will not help when it comes to trying to discriminate between them.

- Then rate each element on 'changeability' (how easy or hard it will be to change this element) from 0 (impossible to change) to 5 (very easy to change).

- Multiply the two scores together and then use those scores to rank the top barriers for intervention for physical activity environment and the top barriers for intervention for the food environment.

7.2 Group sessions

Poster sessions

Representatives from the Region (countries of the Gulf Cooperation Council, Pakistan, Middle East and North Africa) were provided with the background to the obesity epidemic and the ecological and environmental approaches to reducing it. Data for individual countries were provided in an excellent poster presentation. Very high prevalence rates of obesity were noted, as in Table 10. (NB: different sampling frames and age ranges limit rigorous comparisons). In many countries, these figures are hidden beneath flowing robes.

Table 10. Overweight and obesity data for certain countries of the Region

Country	Gender	% overweight (BMI 25–30)	% obesity (BMI>30)
Bahrain	M	37	23
	F	28	34
Islamic Republic of Iran (Teheran)	M	42	10
	F	45	30
Kuwait (NB: diabetes = 18% in 40–59 year-olds)	M	36	32
	F	32	41
Lebanon	M	54	21
	F	38	40
Oman	M	29	10
	F	29	26
Pakistan (NB: inappropriate BMI cut-offs)	M	9	2
	F	12	6
Saudi Arabia	M	17	13
	F	26	20

Working groups

The IOTF-proposed process was put forward and used as a template. The ANGELO model was explained and the above-mentioned energy intake and output categories established. The three groups managed to cover two different topics each in the space of two hours (i.e. six areas were covered in the workshops). Some very useful comments on the process were given and it was apparent that certain aspects of the tasks were not well understood by some. By the end, the majority of people had a good understanding of the process and the goals, and many found it a very useful eye-opener. The process also provided many opportunities for intervention (although people did tend to drift towards nutrition education options). Several observations were noted as follows:

- The concept of sectors was difficult.
- Some participants did not ask questions about the sector groups but merely named them.
- The boxes were helpful but sometimes people got hung up on getting the elements into the right box.
- Dealing in 'barriers' was helpful to conceptualize the question but may have left out important enhancers which needed active promotion.

- Laying out the grid in a 'reverse PHAPO' model may be more helpful, i.e. trace the process from the 'behaviour bit' on the left through the layers of environment going left to right.

The grid used is included as Figure 8, along with a suggested modification (Figure 9) with instructions. The groups came up with 65 potential elements and they then individually rated them in terms of importance and changeability and ranked the top 10 items. Providing the groups with a sheet with the columns already drawn might have made these concepts easier to understand.

The groups gave the top item 10 points, decreasing to one point for the tenth ranked item. The scores for each element were then added and the items ranked. It was an interesting mix of priority areas, with a strong focus on nutrition and on education opportunities. One suggestion was to rank the nutrition and physical activity sets separately to avoid this bias. The results of the exercise are shown in the following section. It must be noted that this is an *example* only. Country teams will need to go through the entire process in the context of developing their national plan for obesity prevention and control.

BEHAVIOUR	SETTINGS	SECTORS
PHYSICAL What is available? (physically available, plus expertise, training opportunities)		
ECONOMIC What are the 'incomes' and costs? (sizes of budgets, costs of goods and services etc)		
POLICY What are the rules? (laws, regulations, policies, formal and informal rules)		
SOCIOCULTURAL What are the attitudes, values, perceptions, beliefs and traditions? (above plus advertising, safety perceptions)		

Figure 8. The grid used in ANGELO group work

Relevant environments	Barriers		Enhancers
	Settings (where the people are)	**Local/regional/national/ international** (organizations, industries, etc which influence settings)	*What parts of the environment which enhance recreational activity need supporting?*
	Parks and open spaces, footpaths, recreation facilities	Local authorities/municipalities, private providers, central government	
Physical Includes the availability and access to the physical environment, as well as to training opportunities, expertise etc.	***What parts of the environment have limited availability or access?*** Open spaces and parks are poorly maintained. Lack of recreational facilities		Footpaths are well-maintained
Economic Includes costs, budgets, incomes, financial incentives.	***What are the financial barriers to people doing more active recreation?*** Cost of joining gyms, clubs, etc Low budget allocations in local government for park maintenance		Access to beaches and bush areas are free to the public
Policy Includes laws, regulations, policies, and formal and informal rules.	***What are the 'rules' which create barriers to active recreation?*** Insufficient recreation space allocated in new subdivisions Lack of regulations requiring footpaths in suburban areas		
Sociocultural Includes society's attitudes, beliefs, values, perceptions and traditions, as well as the influence of advertising.	***What are the social or cultural barriers to people doing more active recreation?*** Negative attitudes towards women exercising in public Physical activity not part of family traditions		Strong cultural support for children's sports

Figure 9. Suggested format: ANGELO analysis – environments related to active recreation

7.3 Potential environmental elements identified for intervention

Importance: How big a contributor is this element in promoting obesity in your area? Rate 'Importance' from 0 (not important at all) to 5 (extremely important).

Changeability: How easy will it be to change this element in your area? Rate from 0 (impossible to change) to 5 (very easy to change).

Importance (I)	Changeability (C)	Score	Rank the top 10	Potential elements
0–5	0–5	I × C 0–25		

Active recreation

- Lack of space in school yards
- Open spaces are unattractive and dangerous with poor access
- Physical activity not part of family traditions
- Lack of parks and open spaces available
- Lack of footpaths/poor quality footpaths
- Lack of club facilities (youth clubs, private clubs, school clubs)
- Expensive to join private clubs
- Attitudes against women participating in some forms of activity/exercise
- Expensive for local governments to maintain parks (watering)

Active transport/car transport

- Lack of easy access to public transport
- Parking is free or cheap.
- Low cost of petrol
- Low cost of cars
- Low investment by government in public transport
- Lack of government expertise in transport planning
- Inadequate enforcement of parking laws (cars parked on sidewalks to escape paying parking fees)
- High status of car ownership
- Riding bikes is not very acceptable (perceived as only for children, low status)
- Not considered safe for people to cycle on the streets
- No cycleways
- Not considered safe to walk on the streets (especially women at night)

Passive recreation (television, videos, etc.)

- Television games are readily available in the home, including televisions in children's bedrooms
- Televisions, etc. are inexpensive
- Telephone calls are free (teenagers spend hours on the phone)
- All the television channels are available at home
- Lack of family rules about television-watching for children television always switched on
- Watching television is an acceptable pastime for children
- Few alternatives for recreation for children

School food

- Street vendors selling high-fat foods around schools
- Lack of school lunch/snack programmes
- Lack of expertise for nutrition education in school
- Limited training opportunities for nutrition for teachers (and expensive)
- Trendy status of Western 'junk food'
- Economic incentives for school canteen owners not conducive with offering healthy choices
- Lack of school rules on the type of food eaten in the school
- Lack of uptake of the Health Promoting Schools (lack of promotion of by MOE/MOH)
- Lack of education of parents about healthy school lunches

Home food

- Lack of awareness among cooks about frying and frying alternatives
- Cooking facilities favour deep frying
- High fat and high sugar foods are readily available in the home (home storage of high fat foods in bulk)
- Government subsidies on fat and sugar
- Low cost of 'junk foods'
- High cost of fruits and vegetables
- Lack traditional recipes which are lower in fat
- Lack of reduced fat options in the supermarkets
- Free allowance of soft drinks in the home
- Family custom of eating in front of television
- Use of high-fat food as a reward
- Serving of large portions is a sign of a good host
- Large amount of advertising for fast food
- Lack of government regulations on television advertising
- Excess food is a sign of affection
- Eating nuts while socializing is a tradition (i.e. not counted as eating food)
- Lack of adequate food labelling
- No tax breaks for healthy foods
- Expert advice to the public is not clear

Catered food

- Limited choices of healthy choices (fried vs. grilled, salad bars, etc)
- Limited training for fast-food operators
- High-fat options are cheap, healthy options expensive
- Set menus don't allow operators to provide a choice for customers
- Special meals offer more for money (upsizing promotions)
- Associated play facilities for children
- Fast foods considered 'trendy'
- Lack of nutrition analysis of fast food for customers

7.4 Ranking of elements

The elements refer to active recreation, active vs. car transport, passive recreation, school food, home food and catered food. The ranking was obtained by multiplying the score for 'importance' by that of 'feasibility'.

1. Lack of awareness among cooks about frying and frying alternatives
2. Lack of expertise for nutrition education in school
3. Lack of school lunch/snack programmes
4. Expert advice to the public is not clear
5. Lack of school rules on the type of food eaten in the school
6. Physical activities not part of family traditions
7. Lack of education of parents about healthy school lunches
8. Limited healthy choices in catered food (fried vs. grilled, salad bars, etc)
9. Lack of footpaths/poor quality footpaths
10. Fast foods considered 'trendy'
11. Lack of reduced fat options in the supermarkets
12. Lack of uptake of the Health Promoting Schools (lack of promotion by MOE/MOH)
13. Lack of club facilities (youth clubs, private clubs, school clubs)
14. Limited training for fast-food operators
15. Street vendors selling high-fat foods around schools
16. High-fat and high-sugar foods are readily available in the home (home storage of high-fat foods in bulk)
17. Family custom of eating in front of television
18. Lack traditional recipes which are lower in fat
19. Expensive to join private clubs
20. Few alternatives for recreation for children
21. Economic incentives for school canteens not conducive with offering healthy choices
22. Lack of adequate food labelling
23. Limited training opportunities for nutrition for teachers (and expensive anyway)
24. Lack of space in school yards
25. Associated play facilities for children
26. Low cost of petrol
27. Lack of nutrition analysis of fast food for customers
28. Riding bikes is not very acceptable (perceived as only for children, low status)

29. High-fat catered options are cheap
30. Television games available in the home, including televisions in children's bedrooms
31. Use of high-fat food as a reward
32. Cooking facilities favour deep-frying
33. Large amount of advertising for fast food
34. Inadequate enforcement of parking laws (cars parked on sidewalks)
35. Lack of family rules on television-watching for children, television always switched on
36. Open spaces are unattractive and dangerous with poor access.
37. Watching television is an acceptable pastime for children.
38. High status of Western junk food
39. All the television channels are available at home.
40. High status of car ownership
41. Low cost of cars
42. High-fat options are cheap, healthy options expensive
43. Lack of government regulations on television advertising
44. Televisions, etc are inexpensive
45. Lack of government expertise in transport planning
46. Set menus (large chain fast-food outlets) don't provide low-fat choices for customers
47. Special meals offer more for money (upsizing promotions)
48. 'Free allowance' of soft drinks in the home
49. Not considered safe to walk on the streets (especially women at night)
50. Low investment by government in public transport
51. Parking is free or cheap
52. Lack of parks and open spaces available
53. Excess food is a sign of affection
54. Low cost of 'junk foods'
55. Serving of large portions is a sign of a good host
56. Attitudes against women participating in some forms of activity/exercise
57. Not considered safe for people to cycle on the streets
58. No cycleways
59. Lack of easy access to public transport
60. Eating nuts while socializing is a tradition (i.e. not counted as eating food)
61. Government subsidies on fat and sugar
62. Telephone calls are free (teenagers spend hours on the phone)
63. No tax breaks for healthy foods
64. Expensive for local governments to maintain parks (watering)
65. High cost of fruits and vegetables

8. CONCLUSIONS AND RECOMMENDATIONS FOR ACTION

The participants agreed that the ANGELO framework is a valuable tool for prioritizing action on obesity prevention and control. The workshops gave a good first insight into the methodology which should be applied in a more elaborate, intersectoral forum at country level. The recommendations for action are as follows.

1. WHO/EMRO should develop and disseminate guidelines for carrying out data collection on obesity. Countries and WHO should together develop training materials on obesity prevention and control. Guidelines should also be prepared for the assessment of obesity and risk factors–questionnaires, established cut-off points and protocol.

2. An intersectoral committee for the coordination of action should be established. The committee will collect data on the prevalence of obesity and identify risk factors of obesity.

3. A national multisectoral steering force should be established to carry out a full ANGELO analysis in order to develop a comprehensive action plan for prevention and management of overweight and obesity.

4. Countries should report back on progress in developing and implementing their national action plan for obesity prevention control in late 2000 at a regional review workshop.

5. To improve accessibility, relevant studies and presentations from this workshop should be made available on the WHO/EMRO web site (www.emro.who.int).

6. A follow-up workshop should be organized to disseminate information and sensitize decision-makers.

Annex 1

AGENDA

1. Registration
2. Opening ceremony
3. Objectives and mechanics of the workshop
4. Global epidemic of overweight and obesity: an overview
5. Overweight and obesity in the Region

5.1. Poster presentation (country representatives)

5.2. Synthesis of questionnaire results

6. Economic costs of overweight and obesity
7. Proposed EMRO model for healthy lifestyles promotion
8. Prevention and control of overweight and obesity: an environmental audit approach
9. Working groups: developing a regional strategy for the prevention and control of obesity in the Region
10. Conclusions and recommendations for action

Annex 2

PROGRAMME

28 November 1999

08:00–09:30	Registration
09:30–10:45	Opening ceremony
10:45–11:00	Objectives and mechanics of the workshop/*Dr Anna Verster*
11:00–11:30	Global epidemic of overweight and obesity: overview/*Dr Chizuru Nishida*
11:30–13:00	Participants put up posters
13:00–15:30	Overweight and obesity in the Region – synthesis of questionnaire results/*Dr Timothy Gill* – poster viewing and presentation of country representatives – discussion
15:30–16:00	Economic cost of overweight and obesity/*Dr Timothy Gill*
16:00–16:30	Proposed EMRO model for promotion of healthy lifestyles/*Dr A. Abdel Latif*

29 November 1999

8:30–9:00	Prevention and control of overweight and obesity (1)/*Dr Anna Verster* – a conceptual framework – dietary approaches – discussion
9:00–10:30	Prevention and control of overweight and obesity (2)/*Dr Boyd Swinburn* – environmental audit approach
10:30–11:00	Introduction of the methodology and guidelines for working groups – working group 1: the ANGELO framework
11:00–13:30	Group work on the ANGELO framework
13:30–14:30	Groups reports
14:30–15:00	Introduction for working group 2: prioritizing areas for further action
15:00–16:30	Group work on prioritization
16:30–17:00	Groups report back

30 November 1999

08:30–9:00	Introduction for working group 3: categorizing priorities into time frame
9:00–10:30	Group work on time frame for action
10:30–11:00	Groups report back
11:00–11:30	Introduction for working group 4: developing the plan of action for prevention and control of obesity in countries of the Region
11:30–13:30	Group work on developing plans of action
13:30–14:30	Groups report back
14:30–16:00	Discussion on action plans Review of the draft conclusions and recommendations for action Adoption of the conclusions and recommendations for action

Annex 3

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