

Keynote Address

The burden of obesity in Asia: Challenges in assessment, prevention and management

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Overweight and obesity have started to emerge as a significant public health problem in Asia. As a whole, the situation has arisen from the changing dietary pattern towards energy-dense and high fat diets, together with a more sedentary lifestyle arising from increasing urbanization. Obesity's threat to the health and economy of the population gives urgency to meeting the problem headlong before it gets any worse. Fundamental knowledge gaps, however, constrain the institution of appropriate measures to prevent and manage this growing problem. Foremost is the paucity of national prevalence and epidemiological data in many countries in the region, coupled with a lack of uniformity in reference standards and cut-off points. While the principles of dietary management, physical activity and behaviour modification are well known, integrating these strategies into a national policy and program in the face of competing priorities is the greatest challenge of all. This requires the collaboration of government, academia, the food industry, the private sector, NGOs and the community, with the assistance of international and bilateral aid agencies, to develop and implement such policies and programs.

Key words: Asia, challenges in assessment, obesity, overweight, prevention, management.

Introduction

According to WHO, the global prevalence of overweight and obesity has reached epidemic proportions. Data from almost 50 populations from more than 30 countries mostly from Europe, USA and Australasia studied in the WHO MONICA project,¹ showed that more than half of adult men and at least a third of adult women had BMI ≥ 25 kg/m² during the period 1983–86. The more recent data from WHO's Global Database on Obesity and Body Mass Index in Adults² covering 84 countries around the world in 1999–2000, showed that the global prevalence of obesity (BMI ≥ 30 kg/m²) was 8.7%. As can be expected, the prevalence was lowest in the least developed countries and highest in the Developed Market Economy and Economies in Transition. The global prevalence translates to more than 300 000 000, with the developing countries contributing a big 39% share because of their large population size.

Apart from this large global prevalence, two other features make this picture even more alarming: the prevalence has been increasing rapidly in the last decades, and the prevalence of overweight and obesity among children appears to be increasing as well. For example in the US, the prevalence of obesity among adults using BMI as the indicator rose from 24.3% in the NHES I survey covering the period 1960–62, to 33.3% in the first phase of NHANES III survey covering the period 1988–94.³ In the case of children and adolescents, the prevalence of overweight among 6–17-year-old youths in the US rose from about 4% in the NHES II/III (1963–70) to about 10% in the NHANES III survey (1988–94).⁴

While the basic cause of overweight and obesity is simply an imbalance between energy intake and expenditure, it is in practice a complex condition arising from a multiplicity of factors: genetic; biological; environmental, and behavioural. Indeed obesity may be aptly described as a genetic misfortune, a behavioural gamble, in a tempting environment.

The Asian picture

What is the picture in Asia?

First is the double burden of under- and overnutrition. While the epidemic of overweight and obesity is raging in the developed countries, most countries in Asia are still facing the double burden of undernutrition and overnutrition, both exerting considerable stress on the health system. Second, the prevalence of overweight and obesity generally rises from childhood to adulthood. Moreover, among countries in Asia, the prevalence rises concomitant with the country's level of socio-economic transition. Finally, the prevalence is generally higher in urban areas than in the rural areas, and in higher socio-economic groups of the population.

Just taking the case of the Philippines, the 1998 National Nutrition Survey conducted by the Food and Nutrition Research Institute showed that undernutrition greatly predominates over overnutrition in the young age groups, but in adults, the problem of overnutrition overtakes that of undernutrition (Fig. 1).^{5,6} In 1998, overweight prevalence in preschool and school children (wt/age of NCHS Standards) was more than 30%, while the prevalence of overweight was

less than 1%. Among adolescents, the prevalence of undernutrition (BMI < P5 of NCHS Table) was 19.8%, while the prevalence of overweight (BMI \geq P85) was 2.9%. Among adults, the prevalence of undernutrition (BMI < 18.5 kg/m²) was 13.2%, while the prevalence of overweight (BMI \geq 25 kg/m²) was 20.2%.

From statistics gathered from countries in the region, it is clear that most of the countries present the classic trend of increasing overweight and obesity as the stage of socio-economic transition advances, and the prevalence is higher in the urban than in the rural areas. In Vietnam, for example, which is in the early stage of socio-economic transition, the prevalence of overweight and obesity was less than 2% in 1992–93, but double in the urban areas compared to the rural areas.⁷ In the Peoples' Republic of China, which is in the later stage of socio-economic transition, the prevalence as shown in their 1992 National Nutrition Survey⁸ was decidedly much more: 14.9% in the urban areas and 8.4% in the rural areas. In Indonesia, the prevalence of overweight in adults in 1993 was 21.5% in the urban areas and 7.5% in the rural areas.

Looking at countries at a more advanced state of socio-economic transition such as Thailand, Malaysia and Japan, the problem of overweight and obesity has started to become alarmingly national in scope and increasing with the years. In Thailand, the prevalence of overweight in adults (BMI > 25 kg/m²) in the 1991 National Health Examination Survey was 20.7% in males and 25.1% in females.⁸ In Malaysia, Ismail *et al.* report a prevalence among adults in urban areas in 1991–94 of 28.7% in males and 25.8% in females.⁹ and in Japan, the prevalence in adults with BMI \geq 25 kg/m² in 1990–94 was 26.2% in males and 23.1% in females.¹⁰

The socio-economic level of households is another important determinant. In a multicountry study among 8–10 year-old school children in four cities in South-east Asia, the disparity in prevalence of overweight between the children of higher socioeconomic status and those in the lower strata was obvious. It was found that the children from private schools in Manila, for example, had a much higher prevalence of overweight and obesity than those from public schools (Fig. 2).¹¹ On the other hand, the children from

public schools had a much greater problem of undernutrition than overnutrition.

Soekirman *et al.* made the same observation in the case of school children in Jakarta and Bogor.¹²

Challenges in Asia

Thus, in Asia, three distinct challenges present themselves: (i) the double burden of under- and overnutrition both exerting greater or lesser degrees of pressure on the health system; (ii) the challenge of halting the generally rising problem of overweight and obesity particularly in the urban areas; and (iii) the emerging problem of overweight and obesity in children and adolescents.

As a whole this situation has arisen from the changing dietary pattern towards energy-dense and high-fat diets, together with the rising urbanization that has brought about a more sedentary lifestyle.

Thus looking at the per capita total dietary energy available for consumption, Popkin *et al.* showed that while the total available energy generally increased in Asian countries, the contribution of dietary fat to total energy increased from 8.8% in 1962 to 23.7% in 1996 in high-income countries including Singapore, Hong Kong, and Republic of Korea.¹³ In lower-income Asian countries including Vietnam, Laos and Kampuchea, the increase was not as much, from 13.0% to 15.9% on the average. At the same time, the contribution of carbohydrate to total energy decreased proportionately. In terms of the different classes of food consumed, the amount of cereals available for consumption in high-income Asian countries on a per capita basis actually diminished from 1962 to 1996, but in middle and lower low-income countries, the amount increased slightly. In high-income countries, the amount of meat/poultry, fish/seafoods, animal fat and added sugar available for consumption increased greatly. There were also increases in the consumption of these foods among middle-income countries including Malaysia, Thailand and the Philippines. The increases for these foods in lower low-income countries

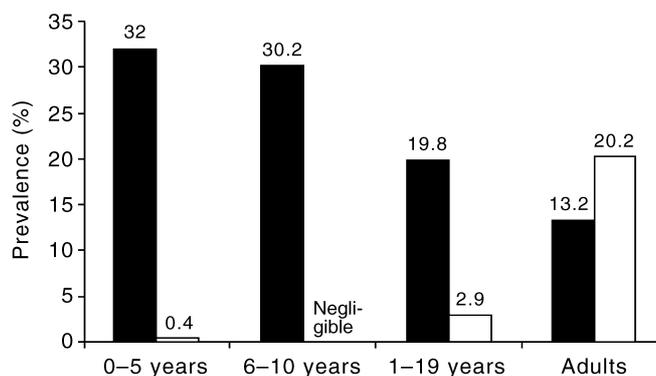


Figure 1. Prevalence of under- and overnutrition in the Philippines, 1998.^{5,6} (■), Undernutrition; (□), Overweight.

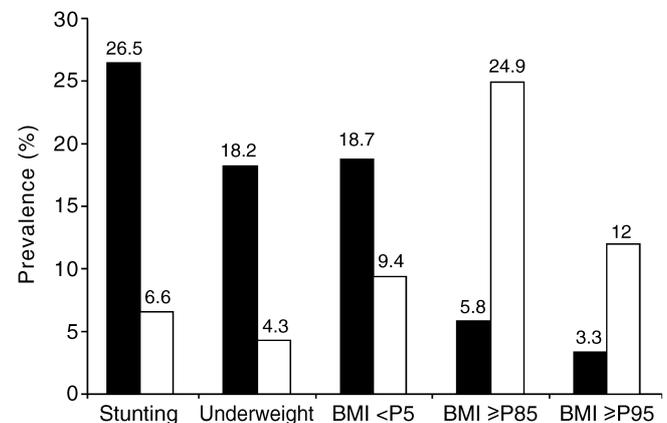


Figure 2. Prevalence of over- and undernutrition in public and private schools among 8–10 year old school children in Manila.¹¹ (■), Public school children; (□), private school children.

were small. At the same time, rapid urbanization is occurring in the countries in the region. This can be seen from the rising percentage of the population residing in urban areas, particularly among the high-income countries, but also to a lesser extent among the middle-income and lower income countries. Urbanization carries with it a generally higher income and therefore higher energy intake, and more calorie-dense foods and more saturated fat. At the same time, urbanization brings about a change in physical activity towards a more sedentary lifestyle.

Under this scenario therefore, there is an urgent need of enacting public health programs and policies to control this growing epidemic. The rationale is clear: overweight and obesity pose a serious threat to the health and economy of individuals, communities and nations. Obesity should be seen as a disease in its own right and not just an aesthetic problem as is being bandied in advertisements of slimming salons and dietary products. The Nurses Health Study in the US involving more than 115 000 middle-aged women followed up over a 16 year period clearly showed a curvilinear relationship between BMI and premature mortality.¹⁴ Moreover, it is now well established that obesity brings about an increased risk to type II diabetes, hypertension, cardiovascular disease, gall bladder disease, and certain forms of cancer – what we now call obesity's comorbidities. The 1997 WHO Consultation on Obesity estimated that obesity carries with it a relative risk much greater than 3 to type II diabetes, gall bladder disease, dyslipidemia, and insulin resistance, a 2–3-fold relative risk to coronary heart disease and hypertension, and a slightly increased relative risk to some forms of cancer and other abnormalities.¹⁵ The increased risk to chronic non-communicable diseases is apparently higher in intra-abdominal (android or central) obesity than pear-shaped obesity. The condition has been linked to the so-called metabolic syndrome, hyperinsulinemia, dyslipidemia, glucose intolerance and hypertension, which in turn links obesity with coronary heart disease.

Overweight and obesity in children and adolescents have immediate and long-term consequences to their health and well-being. Dyslipidemia in the form of elevated serum LDL-cholesterol and triglycerides and lowered HDL-cholesterol has been demonstrated in obese children and adolescents.¹⁶ Similar to adults, there is also evidence that obesity in children and adolescents is linked to glucose intolerance, leading to early onset of type II diabetes. The apparent persistence of obesity into adulthood has been the subject of numerous investigations, and most studies have shown that adolescent obesity has great likelihood to persist to adulthood. Perhaps one of the most pressing consequences of obesity in children and adolescents is its negative psychosocial impact on the young and its adverse effect on socialization. Obese adolescents have been known to develop negative self-image or low self esteem which may persist into adulthood. Then there is the long-term effect of severe nutritional insults during fetal and early life – the so-called fetal programming – that further increases the risk to chronic degenerative diseases in adults. These findings call for

concerted action to prevent overweight and obesity starting early in life.

Finally, obesity poses an economic burden on the health system to manage obesity's comorbidities, not to mention the indirect costs to the national economy as a result of lowered productivity and increased absenteeism. According to the WHO Consultation on Obesity, the burden is relatively greater in developing countries than in developed countries because of the need to use scarce foreign exchange to manage obesity's comorbidities.¹⁵

All these – obesity's threat to the health and economy of the population in Asia – gives urgency to meeting the problem headlong before it gets any worse, approximating that in the West.

Challenges on assessment

Fundamental knowledge gaps, however, constrain clinicians and practitioners, public health workers, and program and policy makers at all levels, to institute measures to prevent and manage this growing problem.

Foremost is the paucity of national prevalence and epidemiological data on overweight and obesity in many countries of the region. Data from a representative sample of the entire population, disaggregated by age, gender, geographical areas, socio-economic levels and ethnic groups are severely lacking. Secular trends on the prevalence of overweight and obesity, movements among socio-economic levels, and their relationship to morbidity and mortality from chronic non-communicable diseases, are sorely needed. Then there is a lack of uniformity in reference standards and cut-off points that are being used in the region to define overweight and obesity.

There is a need for more complete reference standards including taller heights in weight-for-height reference tables and younger ages in BMI-for-age tables. Even using WHO reference standards in children and adolescents, we found discrepancies in using weight-for-height reference compared to using BMI-for-age. In the study among 8–10-year-old school children mentioned earlier, about 10% of the sample children had to be excluded from the analysis because their heights exceeded the limits of the NCHS/WHO weight-for-height table.¹¹ Nevertheless, using the cut-off of BMI > P85 to define 'at risk of overweight' as suggested by WHO gave a prevalence of overweight from 1 to 3 times as much as using weight-for-height Z-score. On the other hand, the prevalence of overweight as defined by BMI > P95 was in close agreement to that defined by weight-for-height Z-score. It appears that BMI ≥ P95 could define 'overweight' in children and adolescents in our population.

The same finding was observed by Tee *et al.* in their study of 8–10-year-old-school children in Kuala Lumpur.¹⁷

While reference standards and cut-off points have been proposed by WHO, there is evidence that risk-based cut-off points may be ethnic specific such that these may be different for Asian populations. Thus a committee from the International Association for the Study of Obesity convened by the WHO-Western Pacific Regional Office proposed a provisional

classification of weight by BMI for adult Asians different from that proposed by WHO for use internationally.⁸ The proposed Asia-Pacific classification puts BMI ≥ 23 kg/m² as overweight with an increased risk to comorbidities, and BMI ≥ 25 kg/m² as obese with a moderate to severe risk. These cut-offs remain to be validated by more extensive scientific data on the relationship of the risk to obesity's comorbidities with fatness from the other countries in the region. Moreover, no BMI cut-offs for children have been proposed by the IASO Committee.

Even more basic than the need to harmonize reference standards and cut-offs in Asia is the lack of data on body composition in terms of proportion of body fat relative to BMI, energy expenditure of physical activities by gender, age and body size, and even extensive and periodic data on food consumption in Asian populations.

An even more practical problem is the question of suitability of simple field methods such as waist circumference and their risk-based cut-off points for large-scale assessment and screening. The use of BMI for field screening is constrained by the problem of obtaining accurate height measurements in the field especially in children, and the difficulty of estimating BMI.

Challenges on prevention and management

Strategies for the prevention and management of overweight and obesity are basically simple enough. The principles of dietary management, physical activity and behaviour modification are well known. We now know more and more about the effective type, level and duration of physical activity that individuals should practice regularly. At the clinical level, behavioural modification techniques and even pharmacotherapeutic agents and surgical interventions have been applied with greater or lesser success. However, at the community and public health levels, examples of successful programs employing these strategies are few, particularly in this region. Singapore has led the region in successfully implementing a program on physical activity and nutrition in schools. The Trim and Fit Program managed by the Ministries of Education and Health is one of the largest and sustained obesity management programs in the world (Anna Jacob, personal communication). Following the Physical Activity and Nutrition (PAN) Program established by the International Life Sciences Institute (ILSI) in 1996, the *Take 10!*TM Program was implemented in the US, encouraging children to take at least 10 min of activity during school hours. Last year, ILSI SEA with the Ministry of Education and School Health Services created and launched the *Power Kids*TM Program to be used as a resource tool for the Trim and Fit Clubs in Singapore schools.

ILSI is building not only its Physical Activity and Nutrition Program for children (PAN-C) but also its program for adults and elderly (PAN-A).

It is imperative that we learn the elements that make these programs successful, remembering of course that strategies are mostly culture specific.

Effective communication techniques for behaviour modification at individual and public health level constitute perhaps the most elusive area because of cultural specificity.

Finally, integrating these strategies into a national policy and program in the face of competing priorities is the greatest challenge of all. This requires the collaboration of government, academia, the food industry and the private sector, media, NGOs, civic groups and the community, with the assistance of international and bilateral agencies, to initiate and develop such policies and programs.

The foremost challenge to government is to gather enough political will to put the problem of overnutrition, which in many countries of the region is decidedly less compelling than undernutrition, in the national agenda. For such an agenda to be operational, it will have to involve many sectors: education, agriculture, trade, social welfare, public works, etc. and not just health. Co-opting all these sectors with very different priorities and agendas will perhaps need a level higher than the Ministry of Health, unless the program starts in a small scale, building up as it attains success, until it gains advocates at the highest levels of government.

The challenge to academia is to supply the basic scientific data needed to forge the political will of government and to formulate science-based policies and effective strategies and programs at various levels. Moreover, it is the responsibility of academia to develop the necessary normative guidelines and tools for the prevention and management of overweight and obesity at individual and community levels. The challenge to academia is made even more daunting not only by technical problems in methodology, but by the usual lack of facilities, equipment, trained staff, and proverbial lack of funds in most of the countries in Asia.

The food industry has the responsibility of providing the market with acceptable and nutritious alternatives to energy-dense and high-fat foods while at the same time fulfilling their economic objectives. Moreover, the food industry has a key role in promoting proper nutrition and healthy lifestyles through their advertisements and marketing strategies. The private sector as a whole could take the responsibility of promoting physical activity among their workers.

The media, NGOs and civic groups could contribute immensely to the information and communication campaign needed to arouse the consciousness of the community on the practice of a healthy lifestyle, the benefits of regular physical activity, and the harmful effects of obesity.

Finally, the assistance of international and bilateral agencies is essential to provide strong advocacy to government for preventive policies and programs and to support the academic community in their search for scientific information necessary to build effective strategies.

Conclusion

The global epidemic of overweight and obesity is at the doorstep of Asia. For the most part, the causes and development of the problem are known. Its consequences to the health and economy of individuals and nations are clear.

There are however, many challenges confronting the academic community in the region to help government forge the political will to confront the problem from a national perspective. The food industry and the private sector, the NGOs and civic groups can contribute immensely to the advocacy effort to promote the culture of physical activity and healthy lifestyle. The international community could provide strong support and advocacy to governments and to the region's academic community to give the prevention and management of overweight and obesity priority attention. The greatest challenge, however, is for government policy makers to put the control of obesity into the national agenda in order to forestall the epidemic of obesity's comorbidities: diabetes, cardiovascular disease, hypertension and some forms of cancer.

We in Asia are at a propitious time when we have the opportunity of avoiding the epidemic of obesity now raging in the West.

But the time to act is now.

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