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The History of Obesity and Its Distribution by Social Class and Geography

Abstract This chapter highlights the vast worldwide increase in overweight and obesity and shows how the different social classes are affected to a different degree. Overweight and obesity also differ in their geographic distribution and their associated increases in the costs of health and a decline in the quality of life. The socio-spatial inequalities enhance the risk of overweight and obesity as they often create an obesogenic environment from which many individuals find it difficult to escape. Overweight and obesity are largely the consequence of various detrimental environmental factors, such as early infants feeding practices. Poverty has been discussed as it may cause the formation of obesogenic families which increases the risk of an unhealthy lifestyle.

Keywords Developing countries · Economic growth · Moral hazard
Obesity and social economic status · Obesity—prevalence · Social behaviour—psychodynamics · Social economic status · Social—spatial inequalities

Introduction

This chapter highlights the vast worldwide increase in overweight and obesity and shows how the different social classes are affected to a different degree. Overweight and obesity also differ in their geographic distribution. The socio-spatial inequalities enhance the risk of overweight and obesity as they often create an obesogenic environment from which many individuals find it difficult to escape.

According to the National Institutes of Health (1998) in the USA, obesity is the second leading cause of preventable death in the USA. Popkin et al. (2011) suggest that 2 billion or more people are either overweight or obese. They show that in 142 countries, urban women had on average higher baseline and greater increases in overweight and obesity as compared with rural women, but they also show that in Latin American countries, North Africa and the Middle East, rural women had higher increases than urban women. However, they also show that urban women in countries with lower GDP have a higher probability of being obese or overweight, and that a greater proportion of urban women were overweight or obese than rural women in low or middle GDP countries.

The prevalence of obesity has increased worldwide; it has more than doubled in the USA and Britain since 1980 (Flegal et al. 1998; Rennie and Jebb 2005). However, the increase in obesity occurs mainly in the upper weight groups (Flegal and Troiano 2000), that is, whilst heavier individuals become heavier still, individuals with a low body mass index (BMI) do not gain as much weight. As medical costs increase faster for those with a higher BMI, the concentration of weight increases in the upper BMI groups actually reduces the quality of life faster than in the population with a lower BMI (Flegal et al. 1998; Rennie and Jebb 2005).

Withrow and Alter (2011) found in their literature review on obesity that between 1990 and 2009, obesity contributed between 0.7 and 2.7% of a country's total health expenditure. The medical costs were found to be 30% higher than that of normal weight peers. Fountaine

and Barofsky (2001) found that obesity reduces health-related quality of life. Obesity has been found to be a contributing factor to numerous diseases, for example, coronary artery disease (Rimm et al. 1995), strokes (Rexrode et al. 1997), diabetes (Colditz et al. 1995) and numerous cancers (Sellers et al. 1992). According to the WHO International Agency for Research on Cancer, 3.6% of newly diagnosed cancers or 481,000 in 2012 were due to obesity, which caused cancer of the oesophagus, colon, rectum, pancreas, gallbladder, kidney, postmenopausal breast, endometrium and ovary.

Adiposity increases faster in the upper BMI groups. This has also been confirmed by Wardle and Boniface (2008) who have found that those at the upper end of the BMI were on average 2.0 BMI points, that is, about 6 kg heavier; so that the proportion of individuals with a BMI between 35 and 40 increased fastest and the most. Wardle and Boniface (2008) have shown that central adiposity increased from 1993/1994 to 2002/2003 for English adults across board, but was four times higher at the 90th percentile than at the 10th percentile. Hence, changes in central adiposity are greatly influenced by environmental factors. They also point out that the increase in adiposity has been greater amongst younger adults so that they are more affected by environmental changes.

Over the last 50 years, the rise of obesity has increased sharply and has reached epidemic proportions. The term pandemic may be more appropriate; a pandemic is an epidemic of worldwide proportion, more often used for infectious diseases. According to the World Health Organization (2003), 300 million adults were obese and over 1 billion were overweight in 2002. This has increased to 1.6 billion adults who were overweight and approximately 400 million adults who were obese in 2005. However, the fastest increase has occurred amongst children (Miller et al. 2004).

Obesity differs markedly between social economic status groups and is a major contributor to inequality in health during life. Infants from lower SES have mostly lower birth weights, but this is reversed by early-to-middle childhood when obesity has developed more in lower SES children (see Langnase et al. 2002; Dubois and Girard 2006). Devaux et al. (2011) argue that the distribution of obesity amongst different SES groups is likely to perpetuate the vicious cycle of obesity and disadvantage.

Wijlaars et al. (2011) suggest that the foundation of SES inequalities in obesity lies in early infants feeding practices. Research by Münster et al. (2009) found that over-indebtedness is associated with individuals' BMI. This confirms that poverty and lower SES groups contribute more to obesity than any other socio-economic groups. Indebtedness is directly related to lower SES, so that indebtedness is another factor of being poor which increases the probability of obesity. There is also a strong correlation between obesity and income inequality. In Western countries, the poorest are also the most obese. Since the beginning of the twentieth century, energy expenditure has declined in high-income countries because of a more sedentary lifestyle, increase in computerization, transport, mechanization and urbanization.

Children have a higher risk of obesity if their parents are obese which may to some extent imply a genetic contribution; however, children and their parents usually share the same micro-social environment, so that they are exposed to the same diets which will also affect the children's eating behaviour when they have become adults.

Genetic and environmental factors have confounding effects towards obesity. However, children pick up the lifestyle from their parents; what may appear to be genetic may in fact be environmental; that is, if the consumption is the same between parents and children, then it will affect obesity in a similar way. Some of the factors contributing towards obesity may be confounding variables whereas others may modify the effect, or even cancel out any effects of other variables. However, there has been a sharp increase in obesity and overweight in genetically stable populations, so that "weight gains can only be attributed to behavioural factors related to an increase in calorie intake or a decrease in physical activity" (Ali et al. 2011, p. 828). Environmental causes of obesity are by far more important than genes, whereby the major cause is overnutrition (Lingston and Zylke 2012). Environmental factors contribute greatly towards obesity; for example, immigrants have increased their weight in proportion to the number of years in the USA (Goel et al. 2004).

Multiple factors contribute towards obesity but such contributing factors change over time and do not relate to each other in a linear fashion. Hereditary as well as individuals' lifestyle are important

contributors towards individuals' obesity as well as multiple diseases. Some but not all cancers are hereditary. Individuals' lifestyle is in most cases a greater contributing factor. The association between hereditary diseases and environment is not always clear; for example, children often eat the same food as their parents so that the resulting obesity may be the consequence of diet rather than of hereditary factors per se.

The behavioural psycho-social risk factors, such as diet and physical activity level, therefore are expected to be the same. Such families may be regarded as obesogenic families (Krahnstoever Davison and Birch 2002). The study by Moreno et al. (2004) shows that in the case of Spanish adolescents, the most important determinant of overweight was the level of maternal education. The risk of obesity also increases when children do lack any or little cognitive stimulation regardless of other socio-economic and demographic factors as was found by Strauss and Knight (1999) in the USA.

Furthermore, Popkin et al. (2011) suggest that if resources are plentiful within a postnatal environment, these developmental adaptations may contribute to the development of diseases. However, as they recognize, maternal obesity is a 'risk factor' for child obesity due to the fact that there has been foetal overnutrition. Olshansky et al. (2005) argued that the sharp increase in obesity during early childhood and consequential deterioration in health may imply that their life expectancy may be shorter than that of their parents and of course, it will have a considerable impact on the healthcare system.

Devaux et al. (2011) found that education reduces obesity, except for Korean men where more education correlated with more obesity. This may well be the case with many countries in transition or late transition, where being overweight or obese is often perceived as being well-fed and therefore well-off. For example, millions starved in China for the first 20 years of the People's Republic, so that Chinese population has now grown bigger and fatter. In Vietnam, fish is now regarded as a diet for poor people, whereas middle classes now eat more meat so that they are expected to have a greater BMI.

The level of obesity varies inversely with the level of education (Drewnowski and Specter 2004), and income generally increases with the level of education. As people obtain higher education, they are able to

exert greater control over their lives, so that their perceived level of stress and insecurity is less; hence, the level of obesity is expected to be less.

Brandl-Bredenbeck (2010) illustrate that socio-spatial inequalities affect children's lifestyle and therefore the degree of obesity. Hence, disadvantaged housing regions in Cologne have negative effects on physical activity and diet and therefore increased obesity, even when individual's social origins were controlled for. Hence, living within disadvantaged residential areas can be assumed to be another risk factor which can induce unhealthy lifestyles. Policies to encounter obesity, therefore, may have to address not only individuals' physical activities, but also the physical environment which will affect individuals' active lifestyles through greater opportunities. Moreno et al. (2004) find that for Spanish males from 13 to 18.5 years old, overweight prevalence increased as socio-economic status declined. To identify groups at risk can further facilitate the optimization of economic resources.

Power et al. (1997) find that of those born in 1958, 44% of girls and 38% of boys who were above the 95th BMI centile at age 7 were obese at age 33. Prentice (1997) argues that in most cases, obesity is caused by environmental and lifestyle factors as the increases in obesity are occurring within a relatively constant gene pool.

There is a negative relationship between obesity and SES in industrialized countries. In developed countries, there is a strong negative relationship between SES and obesity; that is, obesity decreased from the lower social economic group to the higher social group (see Sobal and Stunkard 1989). Socially upward mobile women also showed a negative relationship between obesity and social class; that is, overweight is less common in upwardly mobile women than in downwardly mobile women.

However, within developing countries, most studies show a positive relationship between social class and obesity; that is, obesity increases as individuals move up the social economic class. The reason may be that in many developing countries, thinness is often seen as being undernourished, whereas individuals with a greater BMI are perceived of well-fed and therefore are associated with a higher social class. In richer countries, the lower socio-economic classes are more likely to be obese (see McLaren 2007). Food preferences are changing rapidly worldwide. However, in developed countries, the consumption of protein and fat

declines at the higher income level, whereas in developing countries, the consumption of protein and fat increases along with an increase in income. Countries which experience fast economic growth also have the fastest increase in food derived from animals amongst the lower- and middle-income groups.

In low-income countries, obesity occurs mainly amongst wealthier urban population, mainly female and middle-aged; whereas in high-income countries, obesity occurs mainly in the socially disadvantaged groups at all ages, both males and females. The reason is partly that as people move out of poverty, obesity is regarded as a sign of being well-off, whereas in higher-income countries, income is sufficient for most to overconsume.

As the market in high-income countries has become to some extent saturated, food companies expanded their marketing towards lower-income countries, which explains the time lag of about 20 years when obesity first occurred in lower-income countries. People often satisfy immediate and short-term gratifications without much thought been given to long-term negative consequences. Habit as acquired through one's social class background is another handicap. Globalization led to a transformation of an industrial society towards a financial society within Western countries. It exported manufacturing jobs towards countries such as China. The result is a high rate of unemployment as not everyone has the opportunity to enter the financial sector.

How the psychodynamics of social behaviour affects individuals' overweight and obesity and consequently their well-being is illustrated in Fig. 2.1.

In some ethnic cultures, obesity is associated with 'wealth' like in the case of many Chinese in China. This is also the case with many Micronesians and Chamorros. Furthermore, obesity may result from snacking all the time as a consequence of a constant perceived need of fulfilling short-term gratification as a possible compensation of a non-fulfilled life. Economic and social actors more often than not will not perceive or comprehend the risk that their behaviour entails; so that they have the tendency to take risks because the costs, especially the social costs will not be fully comprehended or they will not be carried fully by the party that takes the risk.

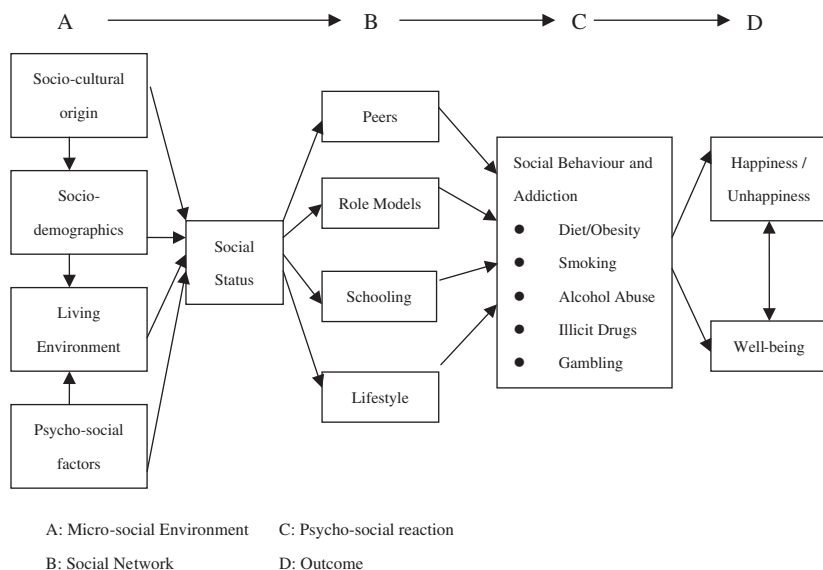


Fig. 2.1 The psychodynamics of social behaviour

Social economic status may also affect individuals' health cover. Individuals with health cover may be more health conscious and thus may be more risk adverse. But the results of the univariate probit model also show that insurance cover had no effect on the rate of smoking. However, it increased the probability of obesity which may be regarded as a situation of *ex ante* moral hazard. Overall, insurance cover is not likely to increase *ex ante* moral hazard. However, using bivariate and multivariate probit models which allows for the probability that the choice of insurance cover is related to choices of lifestyle, the results are quite different. Using a bivariate probit model, the effect of insurance cover is to increase the rate of smoking, sedentary lifestyle and obesity, whilst the effect on heavy drinking remains negative and therefore shows a greater risk of *ex ante* moral hazard. In the case of the multivariate analysis, health cover increased the rate of heavy smoking, lack of exercise and the rate of obesity, but decreased the rate of heavy drinking. Thus, there is the existence of *ex ante* moral hazard. Different behavioural activities may be seen as complementary, whereas others are

substitutes. In this case, obesity, heavy drinking and heavy smoking are complementary as well as obesity and a lack of exercise, whereas heavy drinking and obesity are substitutes in this research. Smoking and obesity may also be considered as a substitute when people keep on smoking because they are afraid to gain weight if they quit smoking.

Protecting individuals from risks that they may incur the full costs of their behaviour may induce some individuals to engage in reckless behaviour; for example, car drivers may drive more careful if they are not insured. Health insurance may also lead to overconsumption of medical services or medication. Moral hazard implies that people will ignore the moral implications of their choices; instead, they seek immediate benefits rather than worrying about the future consequences. Health insurance, however, may not increase reckless behaviour because people who seek out health insurance may be more concerned with their health, and so may be less likely to engage in risky behaviour, such as smoking or excessive alcohol consumption. Stanciole (2008) found that insurance cover decreases the probability of being a heavy drinker or having a sedentary lifestyle, but insurance cover increased the probability of being obese. Stanciole (2008) showed that health insurance has an effect on individuals' lifestyle in regard to lack of exercise, obesity, an increasing propensity in heavy drinking and an increasing propensity in heavy smoking. Such findings may be useful to establish appropriate health insurance policies.

Conclusion

This chapter has discussed the sharp increase in obesity over the last few decades and also discussed the geographical distribution of obesity and overweight and their effects on different social classes and their associated increases in the costs of health and a decline in the quality of life.

Overweight and obesity are largely the consequence of various detrimental environmental factors, such as early infants feeding practices. Poverty has also been discussed as it may cause the formation of obesogenic families. A lack of cognitive stimulation may also contribute further risks towards overweight and obesity. Social inequalities are also

reinforced by social-spatial inequalities which affect individuals' lifestyle. The more impoverished the social-spatial environment, the greater the risk of an unhealthy lifestyle. The different effect of behavioural diseases on insurance cover has also been discussed.

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The Economics of Addictive Behaviours Volume IV
The Private and Social Costs of Overeating and their
Remedies

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2017, IX, 125 p. 1 illus., Hardcover

ISBN: 978-3-319-62535-5