Dietger Mathias

Staying healthy from 1 to 100

Diet and exercise
Current medical knowledge on how to keep healthy

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For Lilly and Lucy

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Lateral growth as a result of maldevelopment in early childhood – A preface

The factors decisive in leading a healthy lifestyle include eating a varied diet, taking plenty of exercise, not smoking and practicing judicious restraint when it comes to drinking alcoholic beverages. It is important to start the education and information process about these facts at an early age. Indeed, children retain these teachings when they turn into adults. Unfortunately, the necessary learning processes fall by the wayside all too often, thereby making childhood maldevelopment an inevitable outcome.

Nearly 22 million children and adolescents living in the European Union are overweight. In one of the more affluent and industrialized countries like Germany alone, this can be said about nearly 2 million of the 3 to 17-year-olds. Around 800,000 of them have already become obese. Every year, over 200 of these fat adolescents in Germany develop adult-onset diabetes. Large international studies have consistently confirmed that adolescents who are too heavy already tend to contract coronary heart disease and cancer in addition to diabetes during middle age at a much greater frequency than their age-matched normal-weight counterparts (▶ Chapter 37). In the USA, the proportion of children suffering from chronic conditions due to morbid obesity nearly doubled over a 12-year period (van Cleave et al. 2010). Close to 17 % of the children and adolescents aged 2 and 19 years living there are obese (Ogden et al. 2012).

The German adolescents who are too fat spend on average 23 hours a day just lying down, sitting or standing. Four out of five 15-year-olds are no longer capable of balancing themselves while moving two or more steps backwards. Nine out of ten cannot stand on one leg for longer than a minute. However, early childhood is when and where the desire and capability to be physically activity starts and actually persists for a long time thereafter. Hence, there are also hardly any limitations in terms of movement competence, even in children up to the age of 6. The problems start around the age of 10 years and become clearly evident in 15-year-olds. In many countries, the children nowadays are around 15 % less fit than their parents were 30 years ago (Tomkinson 2013). That is one reason why exercise training assumes an increasingly important role. At best, it should be initiated in preschoolers. For older children and adolescents, at least one hour of strenuous exercise per day is recommended. Besides its intensity, kinetic variety in exercise plays a pivotal role.

Athletic school children often achieve better overall grades than their "couch potato" counterparts in their age group: That means they get off to a more successful start in their professional lives (Kantomaa et al. 2013, Booth et al. 2014). Because the majority of children then continue to practice sports as adults, they are thereby also sustainably enhancing their quality of life and will benefit over the long term from the many positive health effects emanating from their physical activity. The same similarly applies to stress situations they encounter later in life. In such situations, people usually subconsciously fall back into their old habits. That is when it is beneficial to fall back on good accustomed habits like practicing sports or eating a sensible diet (Neal et al. 2013).

1 Introduction

According to the findings of the Global Burden of Disease Study, 2.1 billion people worldwide are too fat. Since 1980, the magnitude of this problem has grown by 28 % in adults and by as much as 47 % in children (Ng et al. 2014). In Germany, a study on adults' health showed that 53 % of women and 67 % of men are overweight, with 24 % of women and 23 % of men suffering from obesity (Mensink et al. 2013).

Because physical activity and a sensible diet positively impact a person's well-being and health, incentivizing personal initiative and self-responsibility is essential for promoting sensible lifestyles. Obviously, a diet consisting of plenty of fruit and vegetables, but restraint when it comes to eating meat, and a lifestyle that includes physical activity at least 2.5 hours a week, while avoiding obesity and refraining from the use of tobacco will all lower the risk for serious diseases like diabetes, cancer, myocardial infarction and stroke by more than half (Ford et al. 2009, Rasmussen et al. 2013). Another large-scale study on a cohort of 20,900 men and women showed that positive assessment of the lifestyle factors exercise, body weight, sufficient consumption of breakfast cereals, fruits and vegetables, non-smoking and only moderate alcohol intake lowered the risk of heart failure (Djousse et al. 2009). And the key result from investigations on 83,882 women presented by the Nurses' Health Study (▶ Chapter 3) was a reduction in the prevalence of hypertension by 80 % in women who were not overweight, engaged in 30 minutes of physical activity a week and ate a healthy diet (Forman et al. 2009).

That means that it is becoming increasingly helpful for people to be provided with the most comprehensive knowledge on this subject as possible. Namely, if precise knowledge of the facts shapes our thoughts, then the danger that a poorly balanced diet and lack of exercise will shape the body is lower. The more comprehensive their knowledge of the facts is, the easier people can be compelled to modify their lifestyles and the greater becomes the likelihood that their modified lifestyles will be associated with a permanently successful outcome. It is especially important to begin intensively fostering an awareness for a health-promoting lifestyle in children at a young age. This is when they are impressionable and not biased or predisposed. They readily assimilate the principles of good behavior, while no bad habits have been reinforced yet. In addition to the parents, this is also the mission of kindergartens and schools. The prevailing advertising ban imposed by the food industry aimed to protect children under 12 years of age must be complied with unconditionally and with no room for impunity.

Fig. 1.1 Source: dpa/akg

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I Diet

2 "Who doesn't know anything, has to believe everything."

Marie von Ebner-Eschenbach (1830 – 1916), often attributed to Albert Einstein (1879–1955)

Knowledge about the fundamentals of nutrition and diet always confers great benefit. In order to be able to reap these benefits over the long term, habits associated with deep emotions must be added into the equation. It is a given that eating is more than just the intake of food: Eating involves retrospection, ritual, entertainment, often reward – and sometimes it is even an ordeal. However, if we succeed in steering the acquired knowledge along the path of reason, this will most likely also have the desired sustainable effects on health as well.

The physical and psychological harms caused by overweight and obesity are enormous. Approximately one-third of all cancer cases alone can be attributed to the wrong diet. That means that healthy people are not only happier. Indeed, the sounder the knowledge each individual has about health issues, the greater is the added value for our economy. First of all, well-found knowledge can protect against the often high-priced, but useless pseudo-medicinal products offered. Secondly, the constant progress made in all fields of medicine also makes the healthcare system more and more expensive. In 2012, an aggregate of € 300.4 billion was spent on healthcare, € 185 billion (= 61.4 %) of this was spent within the German statutory health insurance scheme. By comparison, the total budget of the Federal Republic of Germany runs at € 306 billion. Treatments for diet-related diseases incur annual costs of approximately € 100 billion. And because the growth in medical knowledge keeps increasing at such a fast pace, the state of the art will no longer be exclusively affordable through fixed health insurance premiums. Over the long or the short: **prevention** is always a sensible financial investment in the future for everyone.

Moreover, the age structure in our society is constantly changing. Ever more people are reaching very old age. According to data from the German Federal Office of Statistics, one in three inhabitants of the Federal Republic of Germany will be over the age of 60 by the year 2030. According to the World Health Organization (WHO), the proportion of individuals in this age group is growing the fastest in almost every country. Viewed from the angle of healthy aging, the financial viability of our healthcare systems assumes an every greater role. Better programs for promoting healthy lifestyle are therefore very important. A general acceptance of them exists. In our times of growing and more prevalent affluence, attitudes towards health take on new dimensions. Surveys have repeatedly confirmed that health is rated as the most valuable commodity.

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3 Pivotal long-term studies

Even the greatest nonsense purported is frequently justified by the fact that there was a study on it. In the field of **nutrition** alone, approximately 9000 articles are published in the medical literature worldwide every year – that is close to one "study" per hour. Reference to such nutritional studies therefore does not necessarily pack that much weight, especially when obviously backed by an interest group from industry. In contrast, the results from recognized research groups working at renowned universities or institutes published in specialized journals with high impact factors are much more compelling (Appendix). Here, the large-scale, international interventional and monitoring trials enrolling tens of thousands of volunteers and lasting many years should be given particular emphasis (Tab. 3.1). Even their findings cannot automatically be assigned the conclusiveness given to laws of Nature, but they do constantly and reliably improve our knowledge about the many details of the physiological interconnections between diet, exercise and health. These form the basis of the content of the following chapters.

Among others, one of the most scientifically sound pieces of research is the **Framingham Heart Study**. On April 12, 1945, President Franklin D. Roosevelt died unexpectedly of a stroke. This event triggered the worldwide-longest, still ongoing study of cardiovascular disease. The town of Framingham with its 28,000 inhabitants in the area of Boston Massachusetts was chosen as the study site. The town's inhabitants were regarded as representing the perfect cross-section of the American population. This study is now investigating the third generation, usually comprising around 5000 test subjects.

Tab. 3.1 Examples of major prospective long-term studies

Study	Ongoing since	Number of subjects
Black Women's Health Study	1995	59,000
California Teachers Study	1995	133,400
Cancer Prevention Study	1960 (to 1972)	1 million
Cancer Prevention Study II	1982	1.2 millions
Cancer Prevention Study III	2010	500,000
EPIC Study	1992	519,000
Framingham Heart Study	1948	5000
Health Professionals Follow-up Study	1986	51,500
Interheart Study	1997	30,000
NIH-AARP Diet and Health Study	1995	567,000
Nurses' Health Study I	1976	122,000
Nurses' Health Study II	1989	116,500
Procam Study	1978	50,000
Whitehall II Study	1985	10,300
Women's Health Initiative	1991	161,800

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