Ilkka Vuori

Exercising for health

Physical activity has always been a prerequisite for health. In the past it mostly took the form of hard work, whereas now it can be a pleasurable experience. Adequate opportunities for physical activity should be available so that people can maintain themselves in a healthy condition.

When looking at children, youths or adults engaged in physical activity, we see healthy people. Are they healthy because of their activity or are they active because they are healthy? A correct answer to this question is important to individuals, families, and private and public organizations, as well as to governments seeking ways of promoting health and preventing disease. If people remain healthy or become healthier because they are physically active there may be a great potential for health promotion.

In order to answer this question we have to understand the nature and meaning of physical activity and sport and to know their effects on health and its determinants. If the effects are favourable and significant, we have to know the possibilities, conditions and limitations for achieving them. It then becomes possible to suggest guidelines for realizing the health potential of physical activity and sport.

Health is not merely absence of illness. It is absence of symptoms; it is energy, balance within oneself and with one’s surroundings; and it is physical, mental and social well-being. It is not a constant state, but a characteristic that changes from day to day. It cannot be measured only in terms of illness and disability—one’s feelings and the quality of life must be taken into account as well. It is influenced by numerous past and present factors in the environment and in our actions. Some of these factors we can control, others we cannot. Growing material well-being increases the capacity of society and individuals to provide the prerequisites of health. Social policy should be such that individuals find it easy to make healthy choices.

Physical activity and sport

Human beings are obviously made for physical activity: they have strong bones and
muscles, flexible joints, exact coordination, large energy stores, and sensitive mechanisms for maintaining balance in widely varying circumstances.

Physical activity takes many different forms. In childhood it is play, characterized by joy and spontaneity. Every child takes part in physically active play if not impeded by internal or external factors. For the child, play helps growth and development and is a means of learning and self-expression; it is a prerequisite for normal physical, mental and social development. For youths, sport is the natural successor to childhood play. In its natural forms it is characterized by joy and spontaneity, and serves many of the same purposes as play: self-expression, social learning, and physical and mental development. In all parts of the world we can see children, youngsters and adults engaged in playing or sports activities. Participation is obviously regarded as the most important element in these activities.

Problems of sport

The joyful spontaneous aspects certainly still exist but a sports industry has arisen in which the primary interest is not to serve the needs of the active participants but to attract a large number of spectators and subject them to various kinds of publicity, some completely incompatible with the values of sport, e.g., the advertising of tobacco and alcohol. The role of the original sports organizations and of the people interested in sport for its own sake is continuously diminishing. Participation is not a goal, merely a by-product. More and more athletes are sold and bought as semiprofessional and professional actors, whose total life is regulated so that the result will be the best possible performances. Sport becomes a tense struggle for victory and material gain, but the greatest profit goes to the media and the sponsors.

Further roles of organized sport

Although top athletes constitute only a small percentage of the younger population, they may have a profound influence on a country's whole pattern of physical activity. The credibility of sports and athletes is therefore immensely important.

As well as being of significance in connection with physical activity and health, sport is a part of national and international culture, and reflects and influences many values, including those of equality, democracy and human rights. The respect or neglect of these values in sport is a measure of the social health of the sports environment.

Physical education in schools

The acceptance of the great value of physical activity and sport in the development of youth is clearly shown in the considerable role given to physical education at school. The main aims are to impart basic skills and motivation on the one hand, and to use physical education as a means of enhancing health, social adjustment, value clarification and other
Table 1. Effects of prolonged physical inactivity (bed rest)

<table>
<thead>
<tr>
<th>Decreases</th>
<th>Increases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance to standing position</td>
<td>Resting heart rate</td>
</tr>
<tr>
<td>Blood flow to the heart</td>
<td>Heart rate in light and moderate exercise</td>
</tr>
<tr>
<td>Endurance (aerobic) performance capacity</td>
<td>Sleep disturbances</td>
</tr>
<tr>
<td>Volume of blood</td>
<td>Urinary output</td>
</tr>
<tr>
<td>Red blood cell production</td>
<td>Urinary excretion of calcium and phosphorus</td>
</tr>
<tr>
<td>Blood haemoglobin concentration</td>
<td>Urinary infections</td>
</tr>
<tr>
<td>Blood flow to muscles</td>
<td>Deep vein thrombosis</td>
</tr>
<tr>
<td>Bone calcium</td>
<td>Tendency to faint</td>
</tr>
<tr>
<td>Bone density</td>
<td>Constipation</td>
</tr>
<tr>
<td>Tolerance to glucose</td>
<td>Blood cholesterol</td>
</tr>
<tr>
<td>Muscular mass and strength</td>
<td></td>
</tr>
<tr>
<td>Muscle tone</td>
<td></td>
</tr>
<tr>
<td>Resistance to infection</td>
<td></td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td></td>
</tr>
<tr>
<td>Balance</td>
<td></td>
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</tbody>
</table>

Physical activity for the elderly and handicapped

With advancing age and in cases of failing health, the scope for independent physical activity decreases although the need for it often increases. Motivation may be weak or lacking, but frequently the favourable results of physical activity cause it to be rapidly increased. Elderly and handicapped people can often benefit most in that their ability to perform daily tasks safely and without undue fatigue may be increased and their opportunities for human contact and pleasure may grow. Society has a special responsibility to make this possible.

Health effects of physical activity

Table 1 shows some effects of prolonged inactivity. They may appear within only days or weeks. The consequences of illness and enforced resting in bed result to a great extent from the associated inactivity.

Research findings indicate that regular exercise has numerous beneficial effects on

Human beings are obviously made for physical activity: they have strong bones and muscles, flexible joints, exact coordination, large energy stores, and sensitive mechanisms for maintaining balance.

...the physical, mental and social condition of the individual. In particular, favourable results are obtainable in people suffering from a low level of fitness, aches and pains of the locomotor system and back, dizziness and fatigue resulting from deficient
circulation, high blood pressure, overweight, and coronary heart disease.

Numerous beneficial psychological effects of physical activity in healthy and ill persons have been proposed (Table 2) (1), especially on mood, depression, self-confidence, anxiety, and some aspects of stress response which increase the risk of coronary heart disease. Some studies indicate improved cognitive functioning and positive effects on school and academic performance (2).

Physical activity certainly exerts favourable effects on physical performance capacity and perceived health. Whether exercise has a preventive function remains largely to be proved, although the evidence suggests that it helps to prevent or delay the appearance of many syndromes and illnesses (3–5) and may add years to life (6). Recent epidemiological findings suggest a further benefit of regular exercise: it may be associated not only with less cardiovascular disease but also with a reduced incidence of some types of cancer (7). Exercise can be viewed as activating every cell in the body to some degree, mostly in ways enhancing physical, mental and social well-being.

The indirect beneficial effects of exercise on health are significant. Exercise may, for example, prevent coronary heart disease directly by affecting cholesterol metabolism and indirectly by reducing overweight and prompting the adoption of healthier dietary habits. Furthermore, the physiological and psychological relaxation resulting from exercise may lower the blood pressure and reduce any craving that exists for smoking and alcohol. The same effects and reduced violence may result from improved self-esteem and possibilities for young people to act out their aggressive feelings.

These indirect effects of exercise on factors liable to damage or endanger health greatly increase its health-promoting potential. Evidence of this has been provided by a comparison of people who take much exercise with sedentary people (4, 8). Short-term studies on the effects of commencing exercise on other habits in middle-aged people reveal only minor beneficial changes. There are good reasons to believe, however, that in the long run physically active people will, on average, be more inclined to choose healthy alternatives than physically inactive people. If this view is accepted, leisure-time physical activity and sports should be promoted much more forcefully than today.

### Minimum and optimum physical activity

It is obvious that some minimum amount of physical activity is necessary for good health. Activity above this minimum to an optimum level will further improve health, help to counteract the influences of ageing and environment, and reduce the risk of some diseases. Still more exercise increases

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**Table 2. Some proposed psychological benefits of exercise in healthy and ill persons**

<table>
<thead>
<tr>
<th>Increases</th>
<th>Decreases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic performance</td>
<td>Absenteeism</td>
</tr>
<tr>
<td>Assertiveness</td>
<td>Alcohol abuse</td>
</tr>
<tr>
<td>Confidence</td>
<td>Anger</td>
</tr>
<tr>
<td>Emotional stability</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Independence</td>
<td>Confusion</td>
</tr>
<tr>
<td>Intellectual functioning</td>
<td>Depression</td>
</tr>
<tr>
<td>Memory</td>
<td>Dysmenorrhoea</td>
</tr>
<tr>
<td>Perception</td>
<td>Headaches</td>
</tr>
<tr>
<td>Popularity</td>
<td>Hostility</td>
</tr>
<tr>
<td>Self-control</td>
<td>Phobias</td>
</tr>
<tr>
<td>Sexual satisfaction</td>
<td>Psychotic behaviour</td>
</tr>
<tr>
<td>Well-being</td>
<td>Stress response</td>
</tr>
<tr>
<td>Work efficiency</td>
<td>Tension</td>
</tr>
<tr>
<td></td>
<td>Work errors</td>
</tr>
</tbody>
</table>
especially the capacity for physical performance but the significance of this for most people is often small, particularly when related to the time and effort required and the risks involved.

What is the minimum quantity of exercise needed, and what is the optimum? It is not possible to set universally applicable criteria because health status varies greatly, different aspects of health can be weighed differently, and the demands on health are not uniform. Furthermore, exercise affects individuals to different degrees and in different ways. Thus, the required minimum and optimum amounts of exercise vary between wide limits.

A WHO expert group has recommended 20 minutes of brisk walking or a corresponding amount of other physical activity as the daily minimum for adults (9). In the light of current knowledge this is a good rule of thumb. It is simple, yet covers several determinants of health-promoting exercise: the duration, frequency, intensity and quality of muscular work.

The recommendation for optimal exercise to give cardiovascular fitness in adults of working age is a minimum of 30 minutes of dynamic activity, straining large muscle groups, every other day. The intensity is sufficient when the exercise induces sweating and breathlessness and yet allows conversation. This means loading the aerobic capacity by at least 50% (10). When a period of 5 to 10 minutes of callisthenics is added, the programme will produce most of the known biological effects that promote health and prevent illness and symptoms. It also fulfils many of the criteria for exercise known to have favourable effects on the mental state. These effects are, however, heavily influenced by other factors, such as the physical and mental environment, people's attitudes towards themselves and exercise, their skills, and their experience of exercise. In different age groups the objectives of exercise regarding health vary considerably (11).

Physical activity is necessary not only for people in sedentary occupations and living in urban areas. Manual work often only makes demands on small muscle groups. It may last for several hours but its intensity is often low. This type of activity has not been shown to produce favourable effects, either biological or psychological. Instead, it may induce muscle fatigue, stiffness and tightness and, in predisposed people, even changes in the joints. These disadvantages can be partly prevented by short periods of stretching and relaxing exercises during and after working hours.

Many occupations involving bodily strain include daily or seasonal peak loads. The work done at low intensity does not lead to sufficient performance capacity for these peaks, which thus present a risk of overloading and accidents. Back injury triggered by heavy effort is an example of what can happen. Thus the manual worker would often benefit from exercise that enhanced general physical performance capacity, muscle restoration, and mental well-being.
Health-promoting potential of physical activity

The health-promoting potential of physical activity seems to be substantial, on several grounds. Its favourable effects extend to all areas of health. Most people benefit from physical activity in some degree, and the overall direct and indirect effects on a population are very considerable indeed. The required amounts and intensities of activity mentioned above seem reasonable, considering most people's situations in the industrialized countries. Minimum activity can take numerous forms, including domestic tasks, physical recreation, and going to work, activities that do not demand special skills, equipment or facilities. Examples of popular and effective kinds of exercise are walking, jogging, cycling, swimming, rowing, cross-country skiing and heavy gardening. However, many young people in urban areas do not find these traditional activities sufficiently interesting. Tennis, down-hill skiing and windsurfing are but three examples of sports that have gained enormously in popularity, but they do not fulfil all the orthodox requirements from the biological point of view. Nevertheless, they do satisfy many biological requirements and, in addition, produce considerable psychological and social advantages. Tastes and possibilities change, and we should be aware of this when making recommendations for physical activity.

Physical activity and sports thus seem to provide a great potential for health promotion, especially in industrialized and urban societies. The same is true in developing countries, but here health-promoting measures other than the taking of exercise may be much more important and more easily accepted and applicable. Nevertheless, when the local culture permits it, the promotion of play facilities for children and sports facilities for youth can be seen as a sound investment in a nation's future.

Utilization of exercise and sport in health promotion

Considering the numerous positive health effects of physical activity and sport, they are underused, recommended too seldom by health care professionals, and inadequately promoted by society. Many factors limit and impede the use of physical activity in health promotion: insufficient knowledge, limited opportunities, indifferent or negative attitudes, and the fringe phenomena associated with exercise and sport.

Research and information

Although physical activity and sport are widely accepted as health-enhancing, their adoption is considerably limited by insufficient knowledge. There are also deficiencies in the transfer of knowledge to experts responsible for implementation, to political decision-makers, and to lay people. Consequently, in many countries too little time is allotted to physical education in school curricula, funds for exercise facilities are insufficient, and health-care personnel are poorly motivated to advise patients to take exercise. Many members of the general public are themselves uncertain about the value of exercise, and consequently settle for
viewing television and drinking beer in their spare time.

In the long run, the development of the prerequisites of exercise and the actual taking of exercise can only come about if there is a sound base of knowledge. It is therefore necessary to investigate the effects of physical activity on health and their prerequisites in order to promote the use of exercise. And, of course, the information and experience gained must be communicated to the general public via the media and health education.

**Limited opportunities for participation**

As mentioned earlier, those who have the fewest opportunities to take part in exercise would often benefit from it the most, including the sick, elderly and socially deprived. The limiting factors include lack of counselling, transport, other facilities, poor income, and an absence of motivation and vigour because of a deprived situation and adverse environmental conditions. They hamper the use of physical activity, exercise and sport for health to a very high degree in non-industrialized countries and in deprived population groups. Exercise and sport are not first-line measures for improving the health of these people, but when the most pressing matters have been dealt with, the potential of physical activity should be fully realized.

**Insufficient motivation**

This may be the key factor limiting health-promoting physical activity in large parts of the industrialized world, where incomes, leisure time, transport, health and sports facilities are such as to allow the majority of the working population to participate without difficulty in physical activities satisfying at least the minimum requirements. Such participation is largely a matter of personal choice and priorities. However, there are large groups of people who, in spite of good motivation, are prevented by cultural restraints or prejudices, personal circumstances, or environmental factors from exercising in any meaningful way.

**Adverse consequences of exercise and sport**

The risk of injury and illness, questions of general healthiness in terms of ethics and morals, and fringe phenomena influence the attitudes of potential participants, parents, spectators, sponsors and decision-makers towards exercise and sport. If exercise and sport become medically or socially suspect, it is to be expected that there will be less support from parents, decreasing active participation, less public and private

**In developing countries, health-promoting measures other than the taking of exercise may be much more important and more easily accepted and applicable.**

sponsoring, and more commercialization involving professional sportsmen or sportswomen.

**Risk of injury or heart attack**

Exercise and sport always carry a risk of injury. It is rather high in alpine skiing, soccer and ice hockey, and low in traditional individual sports. In the latter activities, especially running, the risk of overuse injuries is rather high but easily preventable.
Most injuries are minor, and permanent handicap is rare except where considerable strength, speed and skill are involved, as in motor and alpine sports. Thus, the risk of injury should not be considered a major obstacle for participation in public promotion of most sports. In many sports there is a need to substantially reduce the risk of injury, and ways of achieving this are available.

Boxing occupies a special position among the sports, because the explicit objective is to diminish one’s opponent’s performance capacity. In no other sport is this the case. The blows that boxers inflict on each other’s heads may cause permanent brain damage and induce a gradually worsening condition. The laws governing this sport need urgent revision (12, 13).

Physical activity and sport load the heart and circulatory system, occasionally to an excessive degree causing heart attack and, possibly, sudden death. The absolute risk is small but, especially in strenuous exercise, the frequency of heart attack is definitely increased.

The risk applies only to people with advanced cardiovascular disease, most often coronary heart disease. Unfortunately, the detection of persons at risk is difficult. The risk may be somewhat decreased by advising middle-aged and older people to be moderate in their exercise and to pay sufficient attention to symptoms suggesting cardiovascular disease and factors increasing the risk of coronary heart disease. Fortunately, the estimations of the balance of the risks and benefits of exercise with regard to cardiovascular diseases and their complications suggest that regular exercise diminishes the overall risk of heart attack more than the risk of heart attack is increased during exercise (14, 15).

Risk of psychological harm

Most of us have read in the popular press of joggers, runners and other athletes who have developed a strong addiction to their sport resulting in the neglect of other important things or in severe nutritional disorders. Such cases are extremely rare, and mentally healthy persons run practically no risk of this kind. It is commonly said that in certain cases the compulsion to exercise causes more stress than it relieves. This view lacks scientific proof, but undoubtedly some people with compulsive personalities exhibit this trait in exercise.

Some phenomena mar the image of exercise and sport: hard, specialized coaching in childhood, professionalization, commercialization, extensive politicization, exaggerated nationalism, unnecessary violence, spectator hooliganism, and efforts to improve performance by prohibited or ethically unacceptable means such as the use of drugs, hormones or blood. In particular, the hard, single-minded coaching of children and doping add to the risk of producing sick athletes. The greatest risk is not physical but psychological and social. We have all seen photographs of an unsmiling young Olympic champion in women’s gymnastics. There are many such joyless child athletes, most of them never achieving success despite paying the full price.
The same phenomena cause sport to forsake its ideals and sell its independence. The statements of sports leaders and coaches in response to accusations of doping become evasive and their actions are insufficient to eliminate abuses that diminish people's faith in sport and endanger its future as a respectable, trustworthy and healthy movement.

*Risks and responsibilities of the Olympic movement*

The ideals of sport find their highest expression in the Olympic movement, which is expected to uphold "pure" athletics. A large portion of the public is not attracted by professional sport, but is interested in and willing to support sport in the Olympic mould. The Olympic movement gives the most equal, most honoured and most visible possibilities for participation in sports for athletes from all parts of the world. This is immensely important especially for young and developing nations. Sadly, the movement is constantly under heavy political, commercial and other pressures, and it has not been entirely able to resist them. Perhaps the compromises that have been made are inevitable. The movement certainly needs everybody's support in order to be able to fulfil its responsibilities as the protector and promoter of the health of sport and the health of the athletes.

*Environmental damage*

Some sports, like alpine skiing, require large open areas. Formerly, natural or somewhat modified slopes were acceptable, but the demands on the length, width, profile and accessibility of ski-slopes are continually increasing. The results are deep scars on the landscape, which heal only slowly or even become worse because of erosion. We need sport, but not everywhere and not at any cost, certainly not at the expense of nature.

*Physical activity for all*

The health-promoting potential of physical activity and sport should be used more efficiently. The goal should be physical activity for all. The chances for success are good because of favourable attitudes, good opportunities for participation, relatively low costs, and a low risk of adverse effects. Furthermore, there is a community of interest in the promotion of sport between various parties, such as consumers and producers and the public and private sectors. No strong lobby opposed to the promotion of exercise and sport is to be expected.

In order to attain this goal of physical activity for all we have to increase opportunities and the willingness of the public to participate in health-enhancing physical activities. The need and the possibilities for participation vary greatly between population groups, and therefore people should be strongly encouraged to take part in the planning and realization of such activities.

The traditions, philosophies, ideologies, social systems, available resources, and many other factors related to the promotion of physical activity and sport vary widely. However, the following approaches are widely applicable or adaptable.

- Participation in physical activity is promoted in all its forms, i.e., as part of daily activities and leisure-time pursuits, and as special fitness, health and recreational exercises and sports.
- Actions are planned and implemented in accordance with the needs and wishes of the people.
• Physical activity and sport are promoted by means of communication, education and counselling as well as by increasing exercise facilities and programmes and providing opportunities to use them by making transport available and offering low prices, among other things.

There is often a need for legislation, organizational development, intersectoral cooperation, the training of professionals and volunteers, research and development, and the provision and proper channelling of added funding in order that the above procedures can be satisfactorily put into effect.

Current trends suggest that opportunities to participate in leisure-time physical activity and sport will continue to increase. Factors favouring such development include more time for leisure, rising standards of living, a more even distribution of spending power, and easier transportation. Public concern for the quality of life favours the establishment of recreation areas and facilities. Interest in good health, youthfulness, fitness, and experiences associated with physical activity will probably continue and expand.

As long as people feel life to be worth living, the maintenance of health is likely to be highly valued—even if some sweat is needed in order to achieve the desired result. This optimistic view is based on the assumption that people have an instinctive need for play, sport, and exercise and will satisfy it if given sufficient stimulation and opportunities.

References


Discussion

D. Banerji

—The poor and the rich have different needs

Presumably because the bulk of the people in developing countries are poor, Dr Vuori thinks that health-promoting measures other than the taking of exercise may be much more important and more easily accepted and applicable here. He does not explain what health promotion is or what health-promoting measures he envisages for the poor.

The poor cannot simply be wished away, because quite often the affluent thrive on the sweat, blood and tears extracted from them through unequal terms of trade that can even result in tragedies on the scale of African famines and the Bhopal disaster. Paradoxically, in these circumstances the exercise that makes the affluent healthier and longer-lived is a threat to the health of the poor. The links between exercise and health cannot be sensibly discussed without reference to the political context.

Even if we are to consider only the affluent people of the North, it is necessary in the first place to define health and health promotion. And even if health is considered to be merely a subjective feeling of well-being, exercise is commonly regarded as one of the means of acquiring it. Has this been demonstrated to be true? Exponents of health promotion claim that it is positive and dynamic, opening up the field of health so that it becomes an inclusive social rather than an exclusive professional domain; the emphasis is on advocating healthy public policies and an understanding of the interactions between people and their environment. How do exercise and sport fit into this scheme of things? Furthermore, how does one reconcile the imperatives of health, health promotion, exercise and sport with the extensive medicalization of life, the various types of iatrogenesis, and the induction of dependence? The rapid increase in drug consumption and the rapid proliferation of physicians and hospital beds are, in themselves, symptoms of deep-seated social and economic malady.

The author rightly sounds a note of warning about the danger of market forces distorting exercise and sport. Social marketing techniques can be used to induce people to participate in specific programmes of exercise and sport, and this can erode self-reliance and self-determination.

By shifting the focus from social marketing to an understanding of the importance of

The links between exercise and health cannot be sensibly discussed without reference to the political context.

exercise and sport in the circumstances of everyday life, an entirely new perspective is given to the problem. There is no point in advocating exercise and sport for the large proportion of people who toil from morning till evening every day and yet cannot fully

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satisfy their hunger, or for those who, while providing themselves with enough food by doing heavy physical work, are forced to live under highly unfavourable ecological conditions. A substantial group of comfortably-off people perform adequate exercise in their workplaces and in travelling to and from them. In addition to the exercise that many people perform to earn their living, they may have their own patterns of participation in sport, exercise, entertainment, festivals and feasts, and here any impact on health is fortuitous.

Finally, there are the affluent, who can become easy targets for social marketing in favour of exercise and sport, but it is questionable whether this is the best way of improving their health. In any case, affluent people do not offer an exciting prospect for global action for health by this means.

All the other benefits are secondary. If too much emphasis is given to only the therapeutic value of sport for handicapped people, there is a risk that it will be disliked, especially by young persons.

Specific benefits include strengthening of muscles and improved coordination of the extremities, e.g., by playing a variety of ball games which the children also enjoy in a group. The sense of balance can be improved by utilizing a variety of training equipment but this often leads to boredom. Throwing the javelin or discus, however, is excellent for the improvement of balance and brings joy and pleasure. Swimming has a very high therapeutic value, partly owing to the water’s buoyancy which supports the body’s weight. This effect is helpful for relaxation of spasticity, appropriate coordination of reflexes, and improvement of respiratory and cardiac functions.

As regards the psychological benefits, I should like to quote what the Secretary-General of the International Sports Organization for the Disabled, Mr Hans Lindström, a disabled person himself, has said: “Mental rehabilitation is the most important benefit because of the comradeship in sports and the active involvement with others who are also handicapped. There is joy in doing some things better than others and in sharing the fun by playing together. I would even say that participation in sports reduces the time it takes for a handicapped person to overcome the various phases of denial, aggressiveness and resignation and to reach the goal of acceptance. My own experience with born-handicapped people tells me that in these cases also both self-confidence and general activeness increase with the introduction of sports.”

Many seriously disabled people have to live in over-protective conditions. Their links

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Arie Klapwijk

—Multiple benefits of sports for the disabled

I consider it most important to be clear about the value of sports for people with a disability, because the primary aim is to promote:

— fun in movement;
— joy and pleasure in competition;
— the satisfaction of normal and healthy desires.

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with society have to be restored, which is possible by active participation in sports. This can be arranged through clubs for special sports, informal sports-get-togethers, and a variety of recreational or social contacts. The positive benefits of sport are apparent in all these situations. Coming from an isolated background, you meet other and new people who give you the motivation to live, which you otherwise hardly will find.

Considering all the benefits that sports can bring to the handicapped, it is sad to note that very little use is made of it. For example, a recent study in the Netherlands (1) has shown that in the age group of 18–65 years, only 1.7% of handicapped people joined a sports organization for the handicapped. Among non-handicapped persons in the same age group, 32% were in organized sport while 62% of the Dutch population aged 15–75 years are practising sport with some regularity. According to this study, psychological factors appeared to be the largest and most direct obstacle preventing the practice of sports by physically disabled persons—not the severity of the physical disability itself. It is therefore necessary to bring together all forces, national as well as international, so that everyone concerned, including parents, can be helped to promote sports for the disabled.

In 1984 the International Coordinating Committee of World Sports Organizations for the Disabled was established, with headquarters in Arnhem in the Netherlands. Their task is to coordinate worldwide activities concerned with developing and promoting sports for the disabled. The Committee can help the participating organizations to give their attention to the different interests of specific groups of handicapped (paraplegics, amputees, persons with cerebral palsy, the blind and, since 1986, the deaf and mentally handicapped).

Since the first international sports competition for the handicapped (1948, United Kingdom) the participants have been divided in groups according to comparable functional abilities so that there will be equal chances in the competition. These classifications have reached a reasonable measure of perfection but the International Coordinating Committee is studying the possibility of forming groups consisting of persons with different types of handicap in order to promote integration. On this matter, the opinion of the handicapped athletes themselves will be taken into consideration because their wishes and desires are of highest value.

When I hear in sports circles for the disabled that the ultimate aim should be a total merging with the so-called non-handicapped sports, I am worried because it might lead to the disadvantage of the handicapped. However, I am very pleased with the results of the recent contacts between the International Coordinating Committee and the International Olympic Committee, which led to the participation of handicapped athletes during the Olympic Games in Sarajevo and Los Angeles in 1984, and different world championships in 1985 and 1986.

In the past, training of handicapped persons for national and international championships and the Olympics has received much attention. As a result, the able-bodied world
has come to understand what it means and does not mean to be handicapped. However, the time is approaching when more attention should be given to the recreational sports. The Dutch study mentioned before indicated that while 25% of the interviewed handicapped persons were interested in participating in competitive sports, 75% of them preferred to participate in recreational sports.

It will take a long time before adequate rehabilitation facilities for the handicapped will be available in all developing countries. Manpower, financial means and a basic structure in the public health service are often lacking and much remains to be done. However, with support from the United Nations, an ambitious project to introduce sport for the disabled in developing countries has been started.

In conclusion, sport can provide important benefits to handicapped people although at present very few of them take part in sports. All who work with disabled persons should appreciate the multiple benefits that sport can give to these people. The subject should be included in the training curricula of rehabilitation professionals. Sports facilities should be open to handicapped people and access made easy for them.

J. N. Morris

—A rewarding way to spend a little time

In the United Kingdom only a minority takes significant amounts of exercise. Among the groups that are particularly inactive are women and people on low incomes. In both sexes there is a steep decline in the taking of exercise after early adulthood. Recently, concern has arisen about the inadequacy of exercise in childhood. Schools should assume greater responsibility for ensuring that children adopt the habit of taking regular exercise.

Health promotion should not merely be a matter of keeping disease at bay, but should be based on physiological principles. Exercise, with its extensive influence on bodily functions, can be regarded as a fundamental determinant of health. "Physical fitness" is measured by heart and lung performance in response to exercise and by musculoskeletal strength and mobility. A few simple principles relating to fitness should be explained in health education, among them the following.

- To improve fitness, activity greater in intensity than is customary for the individual is necessary.
- Each aspect of fitness requires a particular kind of stimulus. For example, to improve and maintain cardiorespiratory performance in most adults there is a need for vigorous oxygen-using movement of large muscle masses—as in swimming, brisk walking, cycling, jogging, racket sports and rowing—lasting about half an hour on two or three occasions each week.

Reference


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• Fitness cannot be stored: it is lost after a short period of inactivity.
• Fitness can be improved by exercise at all ages.
• Injury can be minimized if exercise is begun slowly and increased gradually until the desired level is reached.

Individuals have the responsibility of taking adequate exercise and only they can know what is right and enjoyable for them. Society should enable its members to behave in a healthy way by providing facilities for sport and recreation, ready access to the countryside, safe cycleways, and so on, together with health education.

Let us consider some important ways in which exercise contributes to health promotion and disease prevention. Weight control is a matter of correctly balancing food intake and energy expenditure. The more exercise an individual takes the easier it is to achieve this. Moreover, when it is necessary to lose weight the combination of exercise and dieting yields a bonus: the loss can be greater than what would be expected from the energy expended during the exercise. The kind of exercise most likely to help in weight control is the same as that required for improving cardiorespiratory performance: vigorous aerobic activity.

In British studies, vigorous aerobic exercise has been found effective in reducing the incidence of heart attack; in the USA, lighter aerobic activities also appear to give some protection. This discrepancy need not present difficulties in health education practice. It is to be hoped that an explanation will emerge in the next few years, and that the mechanisms whereby exercise combats coronary heart disease will be unveiled. As developing countries advance they should seek to avoid the risk factors for coronary heart disease—such as physical inactivity—that have taken such a heavy toll in the developed countries.

Stamina, suppleness and muscle strength all typically deteriorate with age because of habitual inactivity as well as biological decline. Often compounded by the effects of common joint and other pathology, this deterioration can be a major factor in disability, accidents, immobility and loss of independence in the elderly. The decline in muscle strength and in the aerobic power of heart and lungs with age from the plateau of late adolescence and early adulthood amounts to about 1% per year. However, this process can be slowed down by exercise, the effects of which are much the same in the elderly as in the young. Many old people, beginning with regular, low-intensity exercise, can improve their fitness by 10–15%. There is mounting evidence, moreover, that weight-bearing exercise such as walking retards the loss of

As developing countries advance they should seek to avoid the risk factors for coronary heart disease that have taken such a heavy toll in the developed countries.

bone mineral and thus diminishes the risk of fracture. Experience shows that the elderly are likely to need help in acquiring the self-confidence necessary for embarking on a programme of physical activity if they have led a too sheltered existence.

Today’s movement for health promotion needs new information systems. In the United Kingdom and many other countries
there are no population data on physical fitness except for the military and other special groups. Physiological, epidemiological and social know-how of the kind needed for field studies in this area already exists. In the United Kingdom a national fitness survey is being planned on the lines of one conducted in Canada during 1981. It is hoped that the survey will stimulate interest in exercise and fitness and that the information obtained will be of practical value to people working in the public health sphere.

Kenneth E. Powell

—It is important to consider the different kinds of physical activity

Dr Vuori highlights important aspects of the relationships between physical activity, health, and promotion and correctly states that in industrialized nations many health benefits can be obtained from increased physical activity. A large number of conditions appear to be favourably influenced by it, including those of great public health importance such as coronary heart disease and depression.

Physical activity—movement produced by skeletal muscle—results in the expenditure of energy and correlates with fitness, a set of physical attributes that people possess to a greater or lesser extent. Of the several components of physical activity, the two most commonly discussed are leisure-time activity and occupational activity, each of which can be further subdivided. For example, they can be separated into vigorous activities and those that require a less rapid expenditure of energy. Leisure-time activities can also be divided into sport, household activities, gardening, and so on. The total physical activity pattern of every person has several components, total energy expenditure varies between individuals, and the contributions of the respective components also vary. The average contributions of the different components vary from society to society, not only in respect of occupational activity but also in the selection of sports or modes of transportation. Exercise is a category of physical activity that can be planned, structured and repeated, and has the goal of improving or maintaining fitness. The distinguishing feature of sport is competition between individuals or groups.

Given the complexity of physical activity it is not surprising that there is no single way of measuring it. The methods that have been used include calorimetry, job classification, the keeping of diaries, the conducting of surveys, and mechanical and electronic monitoring. Surveys are most appropriate for large-scale population estimates; several have shown a correlation between reported activity and cardiovascular fitness.

Within any group or society, the proportions and types of people classified as physically active depend on the kind of activity that is measured and the criteria applied to it. Most surveys in North America, for example, show greater activity in youth than in the elderly, in men than in women, and in the well educated than in the poorly educated (1). The focus of a questionnaire, however, has an important effect on results. Surveys that concentrate on sport generally show that men are more active than women, whereas those that cover activities such as dancing, aerobics or domestic tasks show much smaller differences or none. Studies in
which activity is rigorously defined report smaller segments of society to be active than those using a more liberal definition. In the 1981 Canada Fitness Survey, for example, 68% of respondents indicated that they had participated in at least one of 90 listed activities during the previous 12 months, whereas surveys in the United States, taking as their criterion dynamic activity involving the use of large muscle groups at 50% of aerobic capacity for about 30 minutes every other day, indicate that only about 10% of the population is active (2). At present, information about past and present activity patterns of different societies is very limited, because only recently has interest developed in measuring population activity levels and because no survey method has been widely used for a significant length of time.

In general, people in developing countries are probably more active physically than people in developed countries because they encounter less automation in the workplace and less mechanized transport. It is also commonly supposed that a large increase in the physical activity of people in industrialized societies has occurred in their expanded leisure time. However, few data are available to support these assumptions. Where leisure-time activity has increased, the decrease in occupational activity appears to have been greater. In the United States, people today ingest fewer calories, yet are fatter than people were 50 years ago (3).

In spite of these problems it is important to make periodic assessments of the physical activity patterns of societies. Arriving at the best possible survey method is rarely easy. Methods that focus on leisure-time activity are obviously not appropriate for populations in which occupational activity predominates.

When selecting a survey method, a decision should be made concerning the component or components of physical activity to be measured. Unless it has been decided to concentrate on a limited part of physical activity, the assessment should encompass occupational, leisure-time and “moving about” activity, the latter including travel to and from work, doing errands, walking, climbing stairs, and other common activities frequently overlooked in surveys. The method should assess individual behaviour rather than ascribe values on the basis of group membership. Finally, estimates of the frequency, duration and intensity of selected activities provide the most complete description of activity patterns.

These recommendations may need to be modified to accommodate resource limitations. Nevertheless, they should all be considered and any omissions or modifications should have a rational basis. Depending on the population and the goals of the survey, a previously used method may be used either without change or in modified form.

The available evidence suggests that, at least in the developed countries, the health of the many people who are not very active would benefit from more activity. Unfortunately, little is known about how to encourage inactive persons to become more active. Nevertheless, as Dr Vuori suggests, steps can be taken to inform people about the health benefits of physical activity. Efforts to
educate people about how to engage in various activities may be even more important. Any form of exercise should be started at an easily manageable intensity and realistic short-term objectives should be set. Obviously, special facilities are essential for some activities, such as swimming and playing tennis. In some settings the construction of paths or cycleways may be the most appropriate action, in others it may simply be the promotion of activities for which space and equipment are already available.

References


Jennifer Smy

—Health, yes! Body beautiful, no!

First of all I should like to make it clear that I am in complete agreement with the main thrust of Dr Vuori’s article. Although I have been confined to a wheelchair for eight years due to multiple sclerosis, I have nevertheless played in a wheelchair basketball team, and although I am no longer able to continue that activity, I still practise yoga and swim in the summer months. I am convinced that physical activity has been an important factor in my being able to continue to lead an independent life. That being said, I am more than a little unhappy about the all-too-widely-held thesis that exercise and a ‘healthy’ life-style are the panacea to all medical ills, particularly in the developed world.

Since the early 1970s, vast quantities of literature have appeared in medical and scientific journals presenting the evidence that physical activity, healthy life-styles and the general pursuit of “holistic health” are important factors leading to improved health and longevity. Of course, much of this evidence is valid (although I sometimes harbour a sneaking suspicion that so-called valid data, notably those concerning dietary habits, are published rather too quickly, and given wide publicity, only to be called in question by other researchers at a later date).

A rather more worrying consequence, in my opinion, has been that the mass media have been quick to jump on the bandwagon, and commercial interests have been served by what has become the “cult of the body beautiful”. It is now rare to open a popular magazine which does not contain at least one article devoted to the merits of physical fitness and healthy living. It is suggested, although sometimes in a subtle way, that in order to be physically attractive and successful in life one must “measure up” to an ever-increasing standard of physical fitness and beauty. Of course, all of this spells big business, and has led to a proliferation of sports and fitness clubs, gymnasiums, health farms, and aerobics and gym-jazz schools. While it would be foolish to deny the contribution made to health education by popularizing a healthy life-style, or the very real health benefits offered to the sedentary executive by a regular work-out in his local fitness club, let us for a moment consider at least one of the

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negative aspects of an obsessive pursuit of what Carlyon has described as the “Holy Grail of wellness” (1).

A few years ago I worked in a counselling capacity with severely physically handicapped adolescents. A recurring problem for these newly-self-aware teenagers was one of frustration and a very low self-image. Not just because of their physical limitations, for in many cases they had triumphed over these in a remarkable way, but rather because they realized that in spite of their hard-won skills, they would be condemned forever to the sidelines of a society in which a beautiful body was becoming increasingly important. Although they may have wrought miracles with the help of surgery, prostheses, physiotherapy, ergotherapy and schooling, these kids, who spent hours reading popular teenage magazines in order to be like their peers, received the message through those same magazines that they would never measure up.

Is it not ironical to consider that in societies where advanced medical techniques, freely available to all, have done so much to improve the survival prospects of babies born with severe handicaps, and where legislation has removed many of the barriers to education and employment, the “fitness guru” is leading these kids to feel that they will always be substandard humans?

The Constitution of WHO states that “Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity”. Does this not mean that those who must live within the limiting framework of disease or infirmity, but who are nevertheless happy to be alive, who are maximizing their physical potential — however modest it may be — and who are striking out for independence, are also living healthy life-styles? Every concerned health professional would surely answer, “Yes”.

Let us then be sure that as we seek, justifiably, to make the public aware of the health benefits to be derived from the personal promotion of health, through exercise, a healthy diet, a restricted alcohol intake, giving up smoking, etc., we do not serve the interests merely of the “body beautiful” movement and discourage those with a more limited potential who are none the less seeking, in their individual situations, to lead a healthy life.

Reference


Henry A. Solomon
—Health and fitness are not the same thing

Unfortunately, Dr Vuori begins his generally thoughtful paper with an intuitively appealing yet scientifically unreliable image: that of active people being healthy. The fact is that regularly active people are fit but not

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necessarily healthy. To link strenuous activity and health is to perpetuate the misconception that the one promotes the other. Such activity increases fitness, the capacity to do more physical activity, but fitness and health are distinct and independent phenomena. One can, for

example, be capable of enormous amounts of physical activity and yet be fatally ill with coronary heart disease. The confusion of fitness with health reflects the belief that mechanical efficiency is tantamount to either the absence of disease or reduced vulnerability to it.

Consider the cardiovascular training effects of exercise: reduced resting heart rate, reduced heart rate at submaximal exercise, faster return of heart rate to the resting level after exercise, and increased stroke volume. These effects are neither healthy nor unhealthy; they are simply indications of the functional efficiency of the system but not of its health.

Dr Vuori emphasizes what he and many others regard as the health benefits of exercise. The reported benefits include an increase in longevity, a reduction in coronary heart disease, a decrease in coronary risk factors, and the enhancement of psychological well-being. However, there is no unequivocal evidence supporting any of these claims. Longevity is the most compelling of the promised benefits of exercise. Many studies have been made but the results have been highly contradictory. Since any effect of physical activity on longevity would certainly be exerted through its influence on coronary heart disease, investigations into exercise and life expectancy have focused on this. For every study suggesting that physical activity has a reliable effect on coronary disease or associated mortality there is another contradicting it. Even in high-risk post-myocardial infarction patients, where one might expect to see benefits of exercise if there were any, no appreciable effects have been reported. As far as I am aware, no controlled study of such patients where rehabilitation has involved exercise alone has revealed a significant decrease in either recurrent infarction or death.

Indirect benefits of exercise, via effects on coronary risk factors, have frequently been mentioned in recent years. It is true that a small number of studies have suggested some influence of physical activity on cholesterol metabolism and blood pressure. A large number of epidemiological and clinical investigations, however, show no consistent effects of exercise on lipid levels or arterial blood pressure. And even in studies showing such beneficial effects, it is vitally important to ask—as indeed Dr Vuori does—whether people are healthy because they are active or active because they are healthy. Most evidence suggests that people choose their levels of activity in response to inherited or otherwise established health characteristics. In other words, people who are already healthy choose active lives; activity does not lead to health.

Effects on psychological well-being are harder to measure than others but the available evidence indicates that exercise provides no special benefits in this sphere.
and that meditation and simple relaxation are just as effective.

The risks of exercise are, in my opinion, understated in Dr Vuori’s article and merit closer attention. Exercise can be dangerous, even fatally so. The cardiac risks are, of course, the most serious. Sudden cardiac death is closely associated with physical activity. Most studies have found that sudden cardiac death occurs predominantly during or soon after exertion. For example, the sudden death rate during running or jogging has been reported as seven to nine times greater than that during more sedentary activities (1). It is questionable whether it is worth risking instantaneous coronary death through activities not yet proved to be beneficial.

Habitual exercise without symptoms evidently does not give protection against sudden cardiac death associated with a level of activity to which the exerciser is accustomed.

Our concept of cardiac risk associated with exercise has probably been too narrow. The focus has been on tachyarrhythmic death but studies in recent years have shown that bradycardia, conduction defects and heart block, and cardiac standstill may be equally important. In one study, seven young athletic patients suffering from syncope or Stokes-Adams attacks with bradycardia or ventricular pauses required pacemaker implantation (2). Bradycardia in athletes may be an adaptation to physical fitness but may become similar to sick sinus syndrome. Indeed, a new cardiovascular risk factor—changes in heart rate, rhythm and conduction associated with physical training—may have been found (3). A comparison of endurance athletes with nonathletic controls revealed a much higher incidence of long sinus pauses and varying degrees of heart block in the former (4).

Not for a moment am I suggesting that all activity should be avoided. A small risk does attach to sedentary living. The question arises as to how much physical activity is needed to eliminate it without incurring the dangers of excess. The optimum amount, intensity, frequency, duration and types of exercise have not been determined but my own estimation is close to that quoted by Professor Vuori: I recommend walking a minimum of about 2 km a day at 5 km (or more) per hour. Such exercise will probably dispose of the risk of doing nothing, yet incurs no danger even if taken twice daily. Consistent exercise of this kind will lead to a degree of fitness sufficient for coping comfortably with all the activities of normal living and for engaging in moderate athletics. More activity does not engender health; it increases fitness but may also expose the exerciser to risk.

Consequently, it seems to me that only minimal expenditure of public effort and funds on the promotion of physical activity is justifiable. The greatest good for the greatest number would be achieved by persuading sedentary people to become a little more active, rather than by encouraging active people to push themselves harder.

References

Y. Tessema

— Sports, alcohol and tobacco in Africa

Dr Vuori rightly points out the incompatibility between sports and the promotion of alcohol and tobacco. In fact, the ancient slave traders and colonizers utilized alcohol to reduce the fighting spirit of people under their dominion. The case of the Red Indians is vivid in our memory.

Clearly, sports events that have been created to contribute to the physical and moral renaissance of Africans cannot be permitted to exalt the benefits of tobacco and alcohol in our stadiums. Is it this way that we are going to form the true African of tomorrow? The African Football Confederation has, since its foundation thirty years ago, categorically rejected all forms of publicity in favour of tobacco and alcohol in all the stadiums of Africa where its competitions take place. This decision has with alcohol and tobacco firms. We have preferred to renounce these benefits rather than give up the principles we uphold. How can we ask the African youth to become an instrument for the propagation of tobacco and alcohol?

In the United States, England and other countries publicity of tobacco on television screens is prohibited and it is obligatory to print the following warning on each cigarette packet: “Smoking is hazardous to health and can cause lung cancer.” This is not the case in Africa. Why? Don’t we also have the right to protection? Why should we prepare to fight AIDS if we are opening the door to lung cancer which is not less fatal? We have seen in the American Games and the Asian Games—continents embracing advanced countries like the United States, Japan and others—and in the Olympic Games as well, no such publicity is authorized. Thus until now, most sports confederations and most countries have refused publicity in favour of tobacco and alcohol in spite of the fact that all countries that organized big worldwide or continental sports festivals have invested enormous amounts of money for the construction of infrastructures and other preparations.

The World Health Organization has warned us that owing to measures taken by the big countries of America and Europe to fight the propagation of tobacco and alcohol, the international firms have turned towards the countries of the Third World where they hope to recover the market lost elsewhere.

However, recently, the General Assembly of the Supreme Council of Sports in Africa (SCSA) made the surprise decision to grant a country the right to sell publicity in favour of all products, without exceptions, understandably including tobacco and alcohol. In the constitution of the SCSA an

Promotion of alcohol and tobacco at sports events is a threat to the health of Africans.

always been unanimously approved and respected by all the forty-five federations that are affiliated to it.

Football being the most popular sport, we could have, if we had wanted, made millions of dollars by associating ourselves

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article precisely states that the principal aim of the organization is: The reinforcement and conservation of the physical and moral qualities of the African youth by way of practising sports and physical education. How then can an organization whose purpose is so well defined authorize publicity of tobacco and alcohol—products scientifically proven to endanger the health of the African youth it is supposed to protect—on the occasion of its most important festival?

The benefits to health of sports are clearly outlined in Dr Vuori’s article. But promotion of alcohol and tobacco at sports events is a threat to the health of Africans. I do not know if my own health will permit me to continue my functions as President of the African Football Confederation in the near future. That is why my conscience has obliged me to launch a cry to try and save African sport from this threat.

Of course, Mother knew only too well that I was the strongest in my family. When I was a little girl, I often raced with my playmates along the rice fields and no one of my age could run faster than myself. In primary school, I was always the champion in everything I took up—using a skipping rope, hill climbing and running. I even challenged the boys in swimming in rivers and lakes. At the age of eight, I was spotted by a diving coach from a sports school.

The first time I stood on the 3-metre springboard, I was so scared that my legs trembled and my heart pounded violently. Clenching my teeth and closing my eyes, I jumped into the pool. I became bolder and bolder until I could even dive from the 10-metre platform, without the slightest fear. Today I can do a whole set of difficult dives. Diving has become part of my life. It gives me much fun and keeps me in good health.

Yet, you have to train hard to excel. In learning English, you have to read a word dozens of times before you can commit it to memory. In learning a dive, you have to do the movements hundreds of times—the take-off, the twists and somersaults, and the entry. The endless drills on dry land may be very boring, but all the toil and moil will be highly rewarded when you perform a beautiful dive from high up, when you feel a harmony in your movements, when you enjoy an aerial flight, when you emerge.

Zhou Jihong

—Why I love diving so much

After I won the women’s platform diving event at the XXIII Olympic Games in Los Angeles in 1984, I received many cables and letters of congratulations. What was most heart-warming was the cable from my mother. It began with the familiar words she had said thousands of times: “Are you in good health?” This is because in China, it is a social practice for people to inquire after each other’s health when they have not met for some time.

Miss Zhou Jihong’s contribution was received through the good offices of the Permanent Representative of the People’s Republic of China to the United Nations Office and other International Organizations in Geneva, 11 chemin de Survivre, 1213 Petit-Lancy, Switzerland.
triumphant from the surface of the water, and when you feel yourself stronger than ever—both mentally and physically—afer the contest.

To me, diving is a sport in which physical health and mental health are closely combined. You must remain composed when thousands of spectators are staring at you. Jitters are always harmful to your health. When I was in Los Angeles for the Olympic Games, I felt relaxed and I ate and slept well. Competition was tense, but I felt myself in good form and good mood. As in other competitive sports, a diver must know how to conquer himself before he can conquer his opponents.

"Life is exercise", as the saying goes. To live a healthy, long life, you must do two kinds of exercises—the exercise of your body and the exercise of your willpower. I love diving very much because it enables me to do both.

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Health insurance — how an HMO works

Health Maintenance Organizations (HMOs), first introduced in the United States in the 1930s, now provide health insurance for some 23 million people. The principle is simple: physicians associated in a kind of group practice provide care for a stipulated number of patients in return for an annual fixed salary. The patients pay a premium to cover their medical, pharmaceutical and hospital expenses, irrespective of the amounts charged; they must, however, undertake to be treated by physicians belonging to the group and in hospitals that have signed a contract with the HMO. The physicians have a budget to pay for the treatment given to insured persons over a fixed period. If a physician does not use up the whole of the budget he can claim a share, but he must bear a proportion of the deficit if the budget is exceeded. Obviously, the purpose of the system is to make both physicians and patients take responsibility in the fight against medical overconsumption.