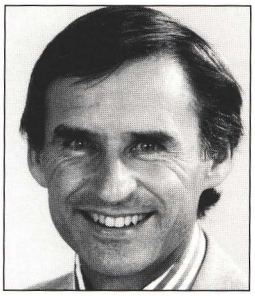
Review Article

Active Lifestyle, Fitness and Health



Curriculum Vitae

Dawie was born in Pretoria and had his school education in Witbank. After having qualified as an air navigator in the South African Air Force, he graduated as a medical doctor in 1968 at the University of Stellenbosch, and received the M Prax Med at Pretoria in 1973. He worked in Pietersburg, Sabie and at the University of the Orange Free State and developed an interest in sport medicine. In 1984 he became a senior lecturer in the Department of Family Medicine and Primary Care at the University of Stellenbosch where he still is. Currently he is interested in all aspects of health promotion and disease prevention through a healthy lifestyle. He conducts regular seminars on health and stress management for various organisations, has a regular sports injury clinic and serves on the South African Sports Medicine Association. He has authored and co-authored a few books in the field of sports injuries, cylcing, doping in sport, etc.

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Summary

After being exposed to various experts in the field in Canada and USA, and the findings of his own research, the author concluded that medicine does not yet know how much of which exercise is needed for a specific situation. He encourages GPs to include exercise therapy as part of their prescriptions – exercise which is health promoting not performance promoting. He defines concepts like Physical Activity, Fitness, Active Living and Health, and analyses what is known about the effects of regular activity on various morphological, physiological and metabolic components of the human body. Only 10% of adults adhere to their prescribed exercise guidelines, and he feels a new approach to fitness is needed, an approach which would also include those who sees physical activity as a natural part of daily life, not a special, segmented undertaking. Basic, long-term research is still needed in this field.

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Introduction

It is almost universally accepted that people who are physically active throughout life generally benefit from a higher level of health and functional capacity than their sedentary counterparts.[1,2] However, the present knowledge base regarding the relationships between physical activity, fitness and health, is not sufficient to give us clear guidelines about the optimum combination of mode, intensity, frequency and duration of activity with respect to health and wellness, or specific health objectives.[3] The purpose of this paper

is not only to make Medical Doctors more aware of the value of exercise as a prescription for health promotion and disease prevention, as well as for the treatment of some chronic degenerative diseases, but also to highlight the present lack of knowledge in the field of exercise and health, and to give a new perspective on an active lifestyle, fitness and health. Practical guidelines will be given for the use of exercise in the treatment of commonly encountered disorders in general practice.

Definitions of Physical Activity, Fitness, Active Living and Health

Physical Activity

According to Bouchard and Shephard (1991),[4] physical activity can be defined as "any body movement produced by skeletal muscles and resulting in a substantial increase over the resting energy expenditure."

Fitness

The consequences of physical activity are seen to comprise both fitness and health. Two types of fitness can be distinguished: performance-related fitness and health-related fitness. Performance-related fitness refers to components of fitness, including motor skills cardiorespiratory power and capacity, muscular strength and endurance that are necessary for optimal work or sport performance. Health-related fitness refers to the capacity to perform daily activities with vigour and alertness, without undue fatigue, and with ample energy to engage in leisure time pursuits, and to meet the above-average physical stresses encountered in emergency situations, as well as to demonstrate low risk of development of hypokinetic disease.

Active Living

GPs should prescribe exercises.

The concept of active living is defined as "a way of life in which physical activity is valued and integrated into daily life".(Fitness Canada 1991).[5] Basic to the active living conceptional framework is that physical activity is part of a dynamic life system , which touches the body, mind, and spirit. It appreciates both the physiological, and the social, mental, emotional and spiritual aspects and benefits of physical activity. It also emphasises the interaction of the individual with others and the environment. Active living recognises that physical activity contributes to increased sense of well-being and quality of life, not simply more muscle, a flatter stomach or greater endurance. It encourages people to participate in activities of their own choice, at their own pace, and that are in harmony with other aspects of their lives.

Health-related fitness, not performance-related fitness.

Health

The World Heath Organisation (WHO) defined health initially as "the state of complete physical, mental and social well-being, not merely the absence of disease or infirmity"(1960), but amended the definition substantially in 1986 to "the ability of an individual or group to change and cope with their environment so as to realise their aspirations and needs." Health is thus defined as a human condition with physical, social, and psychological dimensions, each characterised on a continuum with positive and negative poles. Positive health is associated with a capacity to enjoy life and to withstand challenges; it is not merely the absence of disease. Negative health is associated with morbidity and, in the extreme with premature mortality. Health thus envisioned, is not a static concept, and the WHO defined health

Daily activites with vigour and alertness.

promotion as "the process of enabling people to take control over, and improve their health."[6]

Exercise Prescriptions

Over the past several decades there have been numerous studies that have evaluated the relationship between physical activity and biological and physical status. Standard exercise recommendations, based on the stimulus required to produce a significant increase in aerobic capacity have been incorporated as part of the usual exercise prescription for health, as embodied in the American College of Sports Medicine (ACSM) recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults (1990).[7]

1. *Frequency of training:* 3-5 days per week.
2. *Duration of training:* 20-60 minutes of continuous aerobic activity.
3. Intensity of training: 60-90% of maximal heart rate (220 - age) or 50-85% of maximal oxygen uptake (VO_2 max) or 4Kcal/Kg body weight.
4. *Mode of activity:* any activity that uses large muscle groups, is rhythmical and aerobic in nature and can be maintained continuously.
5. *Resistance training:* moderate strength training: one set of 8-12 repetitions of eight to ten exercises at least 2 days per week to develop and maintain the major muscle groups.

While such a prescription is probably adequate, it may not be optimal and minimal, and selected health benefits will require more specificity. The health and physical activity paradigm needs not be presented as a complex one, if the long term goal is health-related as opposed to the performance-related fitness.[1]

Furthermore, observations indicated that less than 10% of adults adhere to the above-mentioned exercise guidelines in their leisure-time physical activity. This raised the question whether the recommendations were not too strict and rigid. Research done by Steven Blair et al in 1992, indicated the promising results that the level of activity needed to have a profound influence on health and the quality of life may be less than previously envisioned.[2]

Physical activity touches the body, mind and spirit.

It was realised that the dose of exercise that is recommended must be sufficiently rigorous to offer effective therapy , but not so intense or sustained that it provokes cardiovascular emergencies, musculoskeletal injuries, or psychological discouragement in those who are unable to fulfill the required prescription. This has resulted that the ACSM have recently shifted their focus away from the traditional recommendation of very intensive aerobic effort to more moderate but sustained bouts of physical activity as part of a general search for "wellness".

Health is not merely the absence of disease.

The greatest health benefits of exercise appear to occur when very sedentary persons begin a regular programme of moderate intensity, endurance type exercise. Further increases in intensity or amount of exercise produce further benefits in some, but not all biological responses. What the general public would like to know is what the minimal dose is for a specific benefit (not how much do I have to do, but how little can I get away with).

It is generally accepted that the maintenance of moderate physical activity may be more likely to occur than the maintenance of vigorous physical activity.

Lifestyle Exercise Approach

It is apparent that new strategies are needed to encourage adults to become more physically active, and to reduce the prevalence of high risk sedentary behaviour in the population. One such approach is a lifestyle exercise concept designed to help individuals integrate physical activity into their daily routines. The goal is to utilise intervention strategies and behavioural psychology principles and techniques to elicit a positive change in behaviour in sedentary individuals by encouraging activities such as walking, taking the stairs, housework, or recreational activities. The lifestyle exercise approach may not be as intimidating for sedentary persons as the traditional exercise prescription.[8]

In designing an individualised exercise prescription, the physician is faced with the dilemma that we do not know the relative role changes in intensity, duration or volume of exercise play in producing beneficial health changes. It may be that for some benefits, intensity is not critical, and only volume of exercise influences the response. On the other hand, if beneficial changes are related to the amount of fat metabolism that occurs during exercise, then lower intensity exercise will be of greater value. But, if the changes are related to the magnitude of sympathetic drive stimulated by the exercise, then time spent at a higher intensity of exercise would be most effective.

In the treatment of hypertension, moderate intensity (50 - 65% of aerobic capacity) appears to be more effective than higher intensity exercises.[9] In the prevention of osteoporosis, it now appears that frequent exercise may be most effective in helping to reduce the risk of osteoporotic fractures by helping to maximise peak bone density during youth rather than by actually increasing bone density in post menopausal woman and older men. The greater value of exercise in older persons may be to decrease the risks of falling by enhancing muscle strength and possibly balance.[10]

Health: the ability to change and cope with environment so as to realise your own aspirations and needs.

If the intent of the exercise programme is to relieve stress and anxiety, even less is known about the appropriate intensity of effort. Is there a need for the vigorous effort likely to induce a secretion of endorphins and neurogenic amines, or is there a need to increase arousal by proprioceptive stimulation, or is it preferable to engage in gentle, relaxing activity in an agreeable environment?

It is obvious that it is impossible to define a single set of intensity, frequency and duration conditions that would optimally impact on all the health outcomes. However, favourable morphological, physiological and metabolic changes are engendered by moderate intensity physical activity, particularly when sessions are frequent and of long duration.

Health is a process...

The Components and Factors of Fitness

Some of the effects of regular physical activity on the health-related fitness components are summarised as follows:

Morphological component:
- Favours energy balance
- Reduces upper body and visceral fat
- Maintains or increases bone density
- Improves joint flexibility

Muscular component:
- Improves muscle strength and endurance

Motor component:
- Improves balance,coordination, speed, agility

Cardiorespiratory component:
- Increases exercise tolerance
- Improves heart and lung functions
- Reduces blood pressure

Metabolic component:
- Decreases blood triglycerides
- Increases blood HDL cholesterol
- Improves insulin sensitivity of tissues
- Increases lipid oxidation

Motivation Towards an Active Lifestyle

Although there is widespread support for the contention that regular physical activity is almost universally accepted as relevant to health, there are significant barriers – both real and perceived – to become involved in the physical fitness movement. In addition, the fitness movement does not appeal to everyone because it became commercialised, glorifying the image of the young, white, heterosexual, attractive and able-bodied person.

Still, others were not attracted to the prescriptive, high intensity approach to fitness in the 1970s. Such benefits as the joy of play, personal achievement and development, and social interaction were pushed to the side by the overwhelming emphasis on achieving fitness goals. The narrow cardiovascular fitness approach was intimidating, did not meet their needs, and it had little relevance to their daily lives.

Less than 10% of adults adhere to their exercise guidelines

The bottom line is, that a new approach to fitness is needed. The approach needs to have a place for those who want to take part in vigorous activities such as jogging or aerobic classes, as well as those who look to physical activities as a means of relaxation, and as a way to spend time with their families and friends. It needs to address those who want to proceed at a slower pace and those who need to express their personal identity differently. It also needs to encompass those who view physical activity as a natural part of daily life, not as a special, segmented undertaking.

Determinants for a lifelong active lifestyle have been found in childhood physical activity patterns. Childhood social support and encouragement to explore movement and to develop vigorous play patterns create a powerful and lifelong force that determines what individuals value and strive for.

With how little can I get away with?

Physical activity should not be viewed only as a form of exercise, but also as a mode of transportation (walking, cycling) an opportunity for socialisation, to enjoy nature and to get some fresh air, to find solitude, to release tension, to stimulate the thought process, as a form of self expression, personal accomplishment and building of character. The non-fitness related reasons such as social interaction, social support for others, stress relief, peer pressure, psychological benefits and increased self-esteem should be taken more in consideration when prescribing an exercise programme.

Efforts should also be directed to create an active community by promoting pedestrian and bicycle trail networks, playfields and informal open spaces, natural areas and wilderness trails, tree-planting and community events such as fitweek, heartweek etc.

Fitness should also not be viewed in isolation, but seen in conjunction with other components of lifestyle such as smoking, diet, alcohol intake, sleeping patterns, perceived stresses, drug addiction and avoidance of hazardous behaviour.

It has also been realised, that sport and physical recreation is a so-called right brain activity, stimulating the creative part of the brain in contrast to the left brain activities pertaining to analytic thoughts. This explains the relaxing effects of appropriate physical activities and, if well understood, why it is such a powerful motivator to partake in meaningful physical recreational activities. Without a positive attitude towards an active lifestyle, rooted in an almost spiritual motivation to increase the quality of life related to health fitness, fulfillment and satisfaction, the adherence to an exercise programme will be short lived. Besides the socioeconomic and health considerations of an increased quality of life, there are cultural and philosophical or spiritual aspects beyond price.

Plato (427-344BC) realised the important relationship between body and soul, and emphasised the superiority of mind over the body:

"My own belief is, not that the good body by any bodily excellence improves the soul, but, on the contrary, that the good soul, by her own excellence, improves the body as far as this may be possible."

Conclusion

We still have a long way to go before a complete understanding of all the effects of regular physical activity or a persistent sedentary lifestyle is achieved. Thus, at present, an evaluation of the benefits and risks of regular physical activity or of an inactive lifestyle can be based only on partial evidence. Moreover, the small body of knowledge accumulated to date, although impressive by some standards, pertains only to mean effects seen in limited samples of a population. It does not even begin to seriously address the issue of individual differences in host susceptibility to benefits and risks. It is important for all those involved in the areas of physical activity, fitness and health to be neither over optimistic about the role of regular physical activity on health outcomes nor unduly pessimistic about the consequences of a sedentary mode of life. A missionary or crusading attitude cannot replace solid scientific evidence. Further progress in this field, as in any other areas pertaining to health and well-being of humans, will come about only as a result of long term, excellent programmes of basic and clinical research. There is no reasonable and credible alternative.

Exercise in older people effective in strengthening muscles – not for increasing bone density

A new approach to fitness is needed

Fitness for some needs to be a natural part of daily life

References

1. Bouchard C, Shephard RJ, Stephens T, Sutton JR, McPherson BD. (Eds) Exercise Fitness and Health: A consensus of current knowledge. Champaign IL: Human Kinetics. 1990.

2. Blair SN, Kohl HW, Paffenbarger RS, Clark MS, Cooper KH, Gibbons LW. Physical fitness and all cause mortality: A prospective study of healthy men and woman. JAMA 1989; 262, 2395-401.

3. Blair SN, Kohl HW, Gordon NF, Paffenbarger RS. How much physical activity is good for health? Annual Review of Public Health. In press

4. Bouchard C, Shephard RJ. Physical activity fitness and health: A model and key concepts. Consensus Doc. 017, August 22, document prepared for the International Consensus Symposium on Physical Activity Fitness and Health. 1991.

5. Fitness Canada Active living: A conceptional overview. Ottawa: Government of Canada. 1991.

6. World Health Organisation. Ottawa charter on health promotion. Ottawa: Canadian Public Health Association. 1986.

7. American College of Sports Medicine. The recommended quality and quantity of exercise for developing and maintaining fitness in healthy adults. Medicine and Science in Sport and Exercise 1992; 22:265-74.

8. Blair SN, Kohl HW, Gordon NF. Physical activity and health : A lifestyle approach. Medicine, Nutrition and Health 1992; 1(1): 54-7.

9. Blair SN, Goodyear NM, Gibbons, LW, Cooper KH. Physical fitness and incidence of hypertension in healthy and normotensive men and woman. JAMA 1984;252:487-90.

10. Marcus R, Drinkwater BL, Dalsky G, Dufek J, Raab D, Slemenda C, Snow-Harter C. Osteoporosis and exercise in woman. Medicine and Science in Sport and Exercise 1992; 24 (Suppl.) S 301-S 305.