HEALTH AND FITNESS

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Contents

Summary

Health exceeds physical health, and the basis for disease or illness can be detected in all aspects of an individual's life. Health or wellness does not refer merely to the absence of illness, but there are several components of wellness namely; social, spiritual, occupational, intellectual, emotional, environmental, and physical wellness. A healthy and fit lifestyle is a composite of behaviors since individuals are complex beings that do not live in isolation from their surroundings and must interact with their environment and society. As such, an individual's health is affected through numerous different aspects of life that can be divided into two aspects namely; the extrinsic and the intrinsic. It is well established that regular physical activity (or exercise) can enhance both physical and psychological health (an idea that was not novel in ancient civilizations).

Even more relevant today, exercise has been deemed as a key component in health promotion and disease prevention since physical activity may directly and indirectly enhance health. By acting through other behaviors, such as smoking or overeating, regular physical activity can reduce the incidence of a number of diseases. Even though the effects of physical activity on any single risk factor may be small, the effect of continued, moderate physical activity on overall disease risk in conjunction with other lifestyle modifications such as proper nutrition, smoking cessation and medication usage can be remarkable. In this regard, the primary components of fitness include cardiorespiratory endurance, muscular strength, muscular endurance, body composition and flexibility.

1. Introduction

1.1. History of Health and Fitness

The idea that physical activity or exercise can have health benefits is not novel with references to the health benefits of physical activity being found throughout recorded history, even in ancient civilizations such as China and India as early as 1500 BC. Susruta, a 600 BC physician, included physical activity in his prescriptions to prevent and treat diseases. Remarkably relevant then as it is today, Susruta not only advocated physical activity to maintain balance and health, he also promoted physical activity to minimize the consequences of obesity and diabetes. Also remarkably modern in his thinking, Susruta maintained that physical activity had to be performed daily with moderate-intensity to be effective and that physical activity should never be excessive (i.e. never exceed the half-maximum limit for exhaustion) since disease or even death could ensue. Similarly, Hippocrates (460-370 BC considered the father of Western Medicine) stated that "if we could give every individual the right amount of nourishment and exercise, not too little and not too much, we would have found the safest way to health". Similarly, Aulus Cornelius Celsus (ca.25-50 AD, a Roman encyclopedist known for his medical work, *De Medicina*) stated that "for whilst inaction weakens the body, work strengthens it; the former brings on premature old age, the latter prolongs youth".

1.2. Good Health and Physical Condition

In general, health is thought of as the lack of disease or illness and disease and illness are often perceived to be manifested solely physically. However, health exceeds physical health and the basis of disease or illness is detected in all aspects of our lives. Health can be in the form of physical, social, psychological and spiritual with environmental, economical and political aspects imparting its effects on our health. While space does not permit a comprehensive review of the role of social, mental, emotional and spiritual aspects of health, regular physical activity can undisputedly enhance both physical and psychological health. In general, individuals who are physically active in their daily routine or who exercise regularly, feel better mentally and physically which can then result in benefits in the other domains of health. The primary components of physical activity include training to enhance cardiorespiratory endurance, muscular strength, muscular endurance, body composition and flexibility.

1.3. Relationship among Physical Activity, Health and Fitness

In 1996, the release of the United States of America's Surgeon General's Report on Physical Activity and Health provided a springboard for the largest government effort to date to promote physical activity. This historic turning point redefined physical activity as a key component to health promotion and disease prevention not only in the United States of America, but also globally. This importance arose since physical activity may directly and indirectly reduce the incidence of certain diseases. Some diseases that may be prevented or treated through regular physical activity include (but are not limited to) heart disease, non-insulin dependent diabetes mellitus, lung disease, and some forms of cancer. Considerable interest currently exists in how physical activity indirectly

influences health by acting through other behaviors, such as smoking cessation or reducing the occurrence of overeating. If these indirect effects of physical activity can be documented, the relationships between regular physical activity and indirect health enhancing behaviors are of importance not only to epidemiologic research, but also to health education and health promotion programs. In this regard, physical activity may indirectly influence health behaviors such as *inter alia* smoking, diet/feeding behavior, substance and/or alcohol abuse, stress management, risk taking and preventive health behaviors. Further, a strong relationship has been found between physical activity and mortality risk ratios (Table 1).

Calories expended per week	Relative Risk (RR)
> 2500 calories per week	0.54
1000 to 2500 calories per week	0.71
< 1000 calories per week	1.0

Table 1. Physical activity and mortality risk ratio

***Smoking*.** Tobacco use and in particular, cigarette smoking is the single most preventable cause of death and disability. While it is naturally appealing to assume that exercise and smoking are irreconcilable behaviors, smoking and physical activity are only negatively associated, albeit weakly. In this regard, the frequency of exercise may be inversely related to smoking and even relatively small doses of exercise can be used as an aid to managing cigarette cravings and withdrawal symptoms. As such, physical activity may provide support to an individual's attempt to quit smoking and may also improve psychological well being and minimize weight gain and withdrawal symptoms. For these reasons, although further research is needed to determine the mechanisms involved in preventing and/or reducing smoking, such as stress reduction or neurobiological mechanisms, regular active participation in physical activity should be advocated as part of any smoking cessation program.

***Diet/feeding behavior*.** While few studies exist which investigate the relationship between physical activity and diet, regular physical activity has been found to provide favorable alterations in diet in that it decreases appetite in men (but not in women) and in non-obese individuals, but not in obese individuals, effectively reducing caloric and fat intake. Regular participation in physical activity has also been demonstrated to reduce dietary fat preferences, effectively limiting excess calories consumed via an individual's diet. Although the data on the effects of physical activity on feeding behavior is unclear, there is evidence that physical activity may suppress appetite. While the mechanisms of physical activity on appetite have not yet been clearly identified, the type of physical activity (especially the intensity), gender, age and level and type of obesity all have a complex relationship regarding appetite suppression.

Substance and/or alcohol abuse. Physical activity may offer protective effects for substance abuse, especially amongst youth. It has been suggested that physical activity relieves the boredom and stress often associated with the uptake of at-risk and unhealthy behaviors. Specifically, the data on alcohol consumption and physical activity are

inconsistent with physical activity sometimes being positively associated with alcohol consumption. However, some data indicates that higher levels of physical fitness are associated with lower alcohol intake in women, but not in men. Further, physical activity may be used as a treatment for alcoholism since when compared with nonexercising controls, exercising individuals may exhibit higher abstinence rates.

Stress management. Exercise has commonly been advocated in popular press as a treatment for stress. This is because regular physical activity has been demonstrated to serve as a buffer that reduces excessive stress and its potentially damaging effects. One possible reason for this buffering effect may occur since individuals high in fitness, show less physiological reactivity to stress than those who are less fit. This is likely due to lower levels of epinephrine that are released in response to stress. Additionally, regular physical activity may promote favorable changes in stressed individuals (i.e. smoking less), effectively promoting increased health.

Risk taking. A positive association has been found between physical activity and seatbelt use, good driving habits and less general risk taking, even when adjusted for age, sex and education. Regular physical activity has also been associated with reduced participation in unprotected sexual intercourse and the use of illicit drugs.

Preventive health behaviors. The popular belief, "prevention is better than a cure" rightly illustrates the value for and taking action to prevent the occurrence of an undesirable event or condition. Preventive activities include immunization for childhood diseases, the use of protective clothing or sunscreen to prevent skin cancer, health-education and health-promotion programs and the use of automotive passenger restraints and bicycle helmets. In this regard, physically active individuals more often engage in healthy behaviors such as proper nutrition, proper dental hygiene, adequate sleep, and supportive social relationships. Further, these individuals may also be more likely to use preventive health services and be more likely to obtain medical and dental checkups, maintain their immunizations and undergo specialized testing such as tuberculosis (TB) testing and breast examinations. Prevention is more desirable than intervention and therefore the engagement in appropriate health behaviors and the taking of action during an event is desired for optimal health.

2. Extrinsic Factors Influencing Health and Fitness

Individuals are complex beings that do not live in isolation from their surroundings and must interact with their environment and society. In this regard, an individual’s health is affected through numerous different aspects of life that can be divided in two aspects namely; the extrinsic and the intrinsic influences on health and fitness. In this regard, influences such as beliefs, setting, socioeconomic status, politics, racism, education, societal and environmental influences and facilities are considered extrinsic. On the contrary, intrinsic influences on health and fitness include age, genetics, hormones, disease and disability, mental state, religion/spirituality, rest, nutrition and physical activity and are in most instances not possible to alter.

2.1. Beliefs about Health and Fitness

The beliefs and traditions of individuals have a profound effect on their health. These beliefs also influence the types of food, recreational activities and health services utilized. Traditional health-related beliefs and practices among different ethnic groups fall into three groups: (1) beliefs that result in no harmful health effects, (2) beliefs that may produce positive health outcomes and (3) beliefs and traditions which have serious, harmful health outcomes. Immersion into traditional cultures may have a health-enhancing effect, while the stress of cultural transition may be linked with psychological illness and inhibited health.

Harmless beliefs. Many practices established on ethnocentric beliefs are based in folklore and traditional practices, from the Western viewpoint, were once thought to pose barriers to health. However, certain beliefs and practices predict neither lack of access to, nor underutilization of, health services. As such, when such harmless practices are observed, individuals should not be discouraged from placing faith in such beliefs, as they may result in positive health outcomes. For example, although circumcision is practiced for social, medical and cultural/religious purposes, it can guard against an array of infections, adverse medical conditions, potentially fatal diseases and could act as protection for sexual partners against infectious diseases.

Positive health outcomes. It is an underlying premise that physical activity will improve aspects of health and health behavior. This is significant since behavior theories propose that attitude drives the intent to become physically activity, which is significant since physical activity is most commonly evaluated as positive rather than negative. To further minimize the negative and maximize the positive in order to promote physically active behavior, it would be wise for exercise professionals and commercial health clubs to assist individuals (especially overweight or obese individuals) to feel more comfortable around those who are different from themselves and to minimize the intimidating aspects of the exercise environment, while promoting the benefits of exercise to personal health and wellbeing. As such, the ultimate goal is to increase the number of positive beliefs the individual has concerning physical activity. Further, individual beliefs about physical activity should be evaluated for each new participant.

Negative outcomes. Health beliefs and practices also exist that result in physical harm or negative health outcomes. The implications of negative beliefs and misconceptions about exercise affect long-term adherence and efficacy. Although taking part in exercise with medical conditions such as unstable angina, uncontrolled dysrhythmias, recent electrocardiogram (ECG) changes and cardiac events and/or acute myocarditis/pericarditis could be damaging, many individuals shy away from physical activity for one reason or another. Such reasons can include physical activity not being enjoyable, individuals not having time to participate in physical activity and/or sunburn risks of participating in exercise. Further, physical activity does not appeal to some individuals and will not take part in physical activities, especially structured. Only strong influences from the outside can change individuals with negative beliefs toward physical activity. In some instances, even providing extrinsic advice or motivation to physical activity will not necessarily improve an individual's negative beliefs about

physical activity. This is because individuals must translate advice and motivation into practice and learn to undertake physical activity correctly and independently.

2.2. Setting

Differences in setting in terms of rural and urban life could deleteriously impact health. Urban and rural health is usually expressed in terms of utilization, spending and/or geographic distribution of providers and services. Rural areas rank significantly lower on population health indicators, including health behaviors, mortality, morbidity and maternal and child health measures. There exists a rural dichotomy, in which people perceive those who live in rural settings as being more physically active and healthy, whereas in reality rural residents smoke more exercise less, have poorer nutritional habits, abuse alcohol more, have higher incidence of suicide and tooth loss and are often found to be more obese than their urban counterparts. These behavioral disparities are related to income and education status. In this regard, the higher the rate of poverty, the higher the incidence of adult smoking, physical inactivity and mortality related to ischemic heart disease. Another facet that negatively affects rural health is the effect of the physical environment. In this regard, some rural communities' lives are complicated by water quality, agricultural methods, forestry or mining while the vast landscape can influence health by creating actual or apparent isolation. There has also been an increased reliance on technology and motorized devices to replace the physical activity traditionally necessary in an agricultural career. The health of individuals in rural settings can also be adversely affected since rural communities are more sedentary, have lower exercise rates and have restricted access to nutritionists and physical activity promotion programs. This is likely due to the restricted number of or mere lack of physical education programs because of budget cuts. As opposed to rural children, urban children are more likely to participate in sporting activities on a weekly basis. This limited participation could be responsible for the lower aerobic fitness scores and higher levels of obesity in rural children. As a consequence of these sedentary behaviors in rural areas learned during childhood, adults continue to remain sedentary throughout their lifespan.

Efforts to change unhealthy behaviors, especially in the rural environment, have often demonstrated reduced efficacy among low-income, less-educated populations. Due to these disparities between urban and rural life and the poorer state of health in rural populations, a need exists to develop access standards, such as distance to the nearest hospital or ratios of providers to population. In order to achieve these distances or ratios, policies need to be put into place to influence the location of services and providers. Further, to improve rural health social funding needs to be directed to shortages, health care costs need to be reimbursed and financing and policy interventions need to be focused on the health care system. While all of these measures could have a significant effect on the health of rural populations, health educators can only assist in modifying health behavior by being culturally sensitive.

2.3. Socioeconomic Status

It is now well established that, on average, individuals with higher levels of socioeconomic status, education and social provision live longer and are healthier than

those with lower socioeconomic status and lesser social positions. Individuals with lower socioeconomic status have been found to have greater exposure to tobacco vendors and tobacco-related public advertisements and are more inclined to purchase less healthy foods. An individual's financial status can have implications on diet since fresh produce is considerably more expensive, especially in urbanized areas. Although cheaper foods, such as economy or discount brands of foods are provided by most supermarkets, they can have high levels of artificial colorings, flavorings and preservatives, which are often high in sodium and sugars. The area in which an individual lives is largely dependent on their earning capacity; with lower socioeconomic status individuals generally living in urbanized areas in less spacious conditions, closer to areas such as waste sites or areas with pollution problems. In these areas, there is also usually a high rate of crime where it can be potentially dangerous to walk through streets at night while similarly it may be dangerous for children to play outside during the day. As opposed to lower socioeconomic status individuals, higher earning individuals have the opportunity to purchase private health insurance, afford superior doctors and nursing staff and purchase gymnasium memberships.

Further, a higher socioeconomic status individual could allow children to have more facilities to part in regular physical activity in terms of sport equipments acquisition, extracurricular sport sessions as well as a major awareness of their parents regarding the importance of optimizing health and fitness. In this regard, positive associations have been found between socioeconomic status and speed-agility performance, cardiorespiratory fitness, lower-body muscular strength and upper-body muscular strength in boys and girls. However, it must be noted that discrepancies among studies could be due to the specific social and cultural contexts of each country, together with the different methodologies used to assess socioeconomic status and physical fitness.

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Biographical Sketches

Ina Shaw is the Research Manager at Monash South Africa (a campus of Monash University Australia) and is also a Professor Extraordinaire at the Tshwane University of Technology. Ina has authored over 100 journal and numerous other publications with numerous national and international collaborators based in Africa, Asia, Europe and North America. She has been invited to deliver and authored/co-authored over 50 conference presentations in Africa, Asia, Europe and North America. Her research has won numerous awards and her work has been featured in international publications such as Woman's World, Prevention, Runner's World and Muscle and Fitness magazines. Ina's work has been presented to the National Press Club and featured in radio programs in the United States of America. She is currently the President of the International Physical Activity Projects (IPAP) and is a rated researcher at the South African National Research Foundation (NRF). Ina is an Associate Editor of the Global Journal of Health and Physical Education Pedagogy Journal and reviewer for several national and international journals such as the American Journal of Sports Medicine.

Brandon S. Shaw is the Research Chair of the Department of Sport, Rehabilitation and Dental Sciences at the Tshwane University of Technology and is a South African National Research Foundation (NRF) rated researcher. Brandon has authored over 100 peer-reviewed journal publications and numerous other publications with researchers from Africa, Asia, Europe and North and South America. He has authored/co-authored over 60 conference presentations and been invited to deliver presentations in Africa, Asia, Europe and North America. His research has won several awards and led to his research being featured in radio programs and magazines such as Woman's World, Prevention, Runner's World and Muscle and Fitness. He is an Editorial Board Member of such journals as Acta Kinesiologica, Advances in Physical Education, International Journal of Therapy and Rehabilitation (formerly British Journal of Therapy and Rehabilitation) and Sport Science. He currently reviews for 11 national and international journals such as Chronobiology International and also currently serves as the director of the African Chapter of the International Physical Activity Projects (IPAP).