STEPHY Publishers

Trends in Nursing and Health Care Research

Perspective

ISSN: 2771-2842

The Relationship between Sport and Health

Zhang J*

School of Physical Science and technology, Lanzhou University, China

Abstract

Chronic diseases like hypertension, hyperlipidemia, diabetes type II and osteoporosis became more and more frequent as we can live longer now. These diseases, the so-called diseases of the wealthy and powerful, would make one same as the disabled to live, can't enjoy a quality life anymore. Currently, we have no way to cure these diseases; however, there is correlation between one's physical activity and the incidence of such diseases. By investigating studies about physical activity and fitness, it was found that habitual aerobic physical exercising can remarkably improve people's cardiopulmonary functions, maximal oxygen uptake, capillary density, endurance, and increased sensitivity to insulin of muscle, and the strength training can also effectively improve the muscle strength of old people, people with habitual physical exercise have lower morbidity and mortality in CHD, as well as lower incidence of hypertension, hyperlipidemia, diabetes type II, osteoporosis, and many other diseases. Combined with personal experience in habitual physical exercise, the increased dopamine which can improve one's mood, the modified functions of blood supply and aerobic respiration ability, and even enhanced working memory therefrom can effectively make one happier, healthier and less likely to get chronic diseases like hypertension, hyperlipidemia, diabetes type II and osteoporosis, one can get over-recovery by enough rest and adequate nutrients ingestion after exercising since one's dopamine was increased.

Keywords: Habitual physical exercise, Chronic diseases, Insulin sensitivity, Cardiopulmonary functions, Dopamine

Introduction

According to Darwin's theory, human comes from evolution same as any species on the earth. Though human is not animal according to traditional Chinese culture, we could come from same process. The difference between human and animal is whether one has spirit, has love, can do things for love, and must create what he wants by his own work but can't do anything for money according to Marx as well. Human invented agriculture for producing foods they want by themselves, they work by themselves instead of waiting for the god to feed them, this should be a proof that man is not animal, could create material by their own work but not only eat and live as animals. It demanded high level of physical ability for human in ancient eras for work, and now as the development of our technology, it doesn't require us high level of physical capacity anymore, but it is still necessary to our health to keep our physical ability.

Modern human, especially in developing countries, the diseases of the rich and powerful became more and more frequent, which

Quick Response Code:

***Corresponding author:** Jiayi Zhang, Theoretical Physics Class 3, Lanzhou, Gansu, 730070, China

Received: 29 September, 2023 **Published:** 03 October, 2023

Citation: CZhang J. The Relationship between Sport and Health. *Trends Nur Health Care Res.* 2023;3(3):1–4. DOI: 10.53902/TNHCR.2023.03.000528

includes obesity, hypertension, hyperglycemia, hyperlipemia and many other chronic diseases. Nowadays we have much better nutritional condition than 100 years ago, but we still don't have satisfying health condition now.

Now we can get enough food supply, don't starve anymore and we could live longer thereby; however, though we live longer, the quality of our living is still undermined by such chronic diseases. What caused them and how to keep healthy? And it would be better if we can prevent them. It is noticed that these chronic diseases, the so-called diseases of the rich and powerful, have higher rates in sedentary groups, the crucial factor that leads to the diseases should be inactivity in sports.

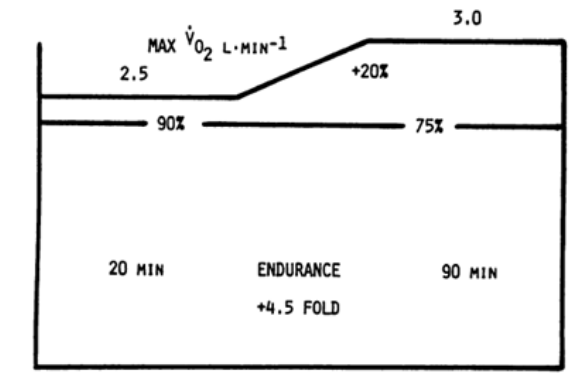
In researches, it was found that sport does have remarkable effects in maintaining people's health, comparing people who have habits of physical exercising with those who don't have in different age groups. In same age group, people who have habits of physical exercising have higher power of aerobic respiration and better endurance in aerobic sports. Among different groups, habits of exercising could likely reverse the trends that one's respiration power or maximal oxygen uptake go lower by each year. Habits of physical exercising could effectively improve one's health and make one get older more slowly.

Physical Exercise and Health

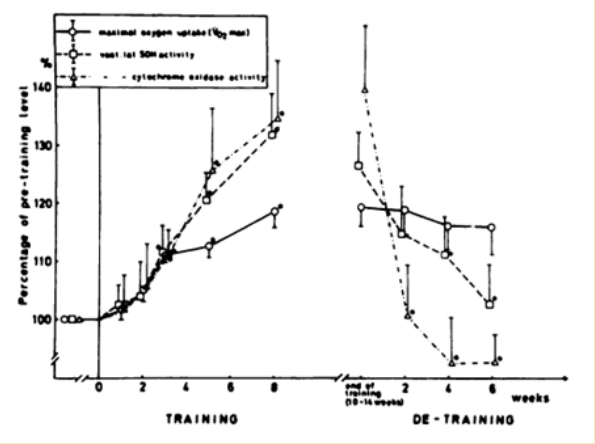
In figure 1 of Astrand PO,[1] a group of people were trained in a project. The training is to choose 3 days in each week to do aerobic physical exercise, of which the intensity is 70% to 80% to one's maximal aerobic power, for 30 minutes in one time. After training, the aerobic power of the people got remarkable improvements, they were shown in two respects, the increase in one's maximal oxygen uptake and the better sustainability of aerobic respiration, one can keep longer time at fixed intensity of aerobic respiration. It is shown in Figure 1, a subject could get remarkable improvements in his maximal oxygen uptake and endurance.

In the following experiments, as shown in Figure 2, the activities of 2 kinds of mitochondria enzymes were also compared after a period of physical conditioning, as figure 2 of Astrand PO shows, the maximal oxygen uptake and one's ability of aerobic respiration had been improved remarkably after 2 months of training but dropped back after less than 2 months of detraining. One have to keep exercising to remain the effect of exercising to health, it may be a good dose to keep aerobic physical exercise with intermediate intensity, at about 50% to 80% of one's maximal aerobic power, for 30 to 60 minutes in one time per one to two days.

The improvement of aerobic respiring ability is related to many effects of physical exercising, people who have habits of physical exercising get better cardiopulmonary functions, increased capillary density, and these promote the transportation of the material that is related to aerobic respiration. Lipoprotein lipase (LPL) is also an enzyme related to aerobic respiration, the enhancement of its activities could enhance the ability to consume fat of the body so that one could have better endurance and be easier to stay away from obesity, the increased capillary bed could make this. One is not healthy when he is too fat or too thin.



Figures 1: An untrained subject has maximal oxygen uptake of 2.5L/min, can exercise at 90% of this maximal only for 20 minutes. After being trained, one's maximal oxygen uptake raises to 3.0L/minutes, and he only needs 75% of this maximal to perform the same exercise, could keep 90 minutes, the endurance is about 4.5-fold of that before.[1]



Figures 2: The changes of the activities of two mitochondrial enzymes and maximal oxygen uptake during and after a period of physical conditioning. Cited from Astrand PO.

Moreover, despite the improvement of aerobic respiration ability taken by aerobic exercising, some anaerobic exercises also have effects to health which can't be neglected. In study of Astrand PO , the physical strength-training program could increase the strength of the skeleton muscles of the objectives by 20% to 40%, and the increase is only in the fiber size of the muscles, no increase in the number of the fibers. Physical strength is crucial to one's daily ability to move, and stronger muscle could prevent more injury.

Aging could cause one's body functions to degenerate, such as physical strength, endurance, bone density and even thinking abil-

ities. However, one could reverse this trend by keeping exercising. In Astrand PO, it is pointed out that people who don't have habits of physical exercising have a decline of 0.5% to 1% per year in maximal oxygen uptake, but a study mentioned shows that people who have habitual physical exercising activities would not have such decline. A group of people, whose ages are between 60 to 70, got increase of 38% in their maximal oxygen uptake, after being trained with physical exercise with the dose which may be a good dose as mentioned above, for 12 weeks, and another group whose ages are between 20 to 30 got 29% increase after being trained in similar physical exercise. Such increase is remarkable. This shows that habitual physical exercising could slow down and even reverse many functional degenerating related to aging. In Astrand PO, old people can also get stronger after physical strength training. They let some volunteers who are about 90 years old to do concentric and eccentric activation of knee extensor muscles, three times per week, three sets of repetition for each time, each set has 8 repetitions on each leg, and found their physical strength gained averaged $174 \pm 13\%$ increase, midthigh muscle area gained 9.0±4.5%, mean tandem gait speed got improved 48% after training. This shows training is effective to old men, exercising could always improve one's aerobic power, physical strength, and other physical condition, i.e., reverse the degeneration caused by aging. It is worth mentioning that the effect of exercise to one's health and ability is not only on physical part, but also the mental part. To keep learning could effectively make one have not only better mind but also better mood to keep healthy, e.g., Professor Duàn Yī Shì could still work on physics by himself when he was 90, saying geodesics is just if we threw a steamed bun with meat inside what it would do thereafter, when he was diagnosed with cancer. Why would the dog chase the steamed bun? Because it likes, and why everything is that may just because it likes, and Professor Duàn Yī Shì could still clearly understand these when he was 90. When one always uses, it would become stronger; otherwise, it would degenerate, and perhaps any function of body or ability have potential not to degenerate, one just need keep exercising it. Both physical and mental exercises are effective to keep the related functions and abilities of the body to be better, Lù Yóu once said that one would never forget if he kept learning, never lose his ideal and faith if he kept reflecting on himself. To keep learning and exercising every day is much easier and more effective than to do them in once. In the study of Astrand PO, it was also found that people who have habitual physical activity have lower incidence of chronic diseases, such as diabetes type II, osteoporosis, obesity, hypertension, hyperlipidemia, colon cancer and even many psychological diseases.

In summary, according to the studies in Astrand PO and some experiences from personal practice, some benefits of habitual physical exercise are known as below:

1. Increase maximal oxygen uptake, enhance cardiopulmonary functions and ability of aerobic respiration. Better sustainability of aerobic power, improved endurance.
2. Higher capillary density which can promote the activity of lipoprotein lipase (LPL), and LPL can promote the consumption of free fatty acids as energy resources in muscle.
3. Lower blood pressure and heart rate at same level of blood supply. One has lower blood pressure at normal state, beneficial to preventing hypertension. Swimming doesn't raise one's blood pressure. Swimming can also benefit one's thermoregulation ability.
4. Enhance the sensitivity of muscle to insulin and normalize the glucose tolerance in old people, beneficial to prevent diabetes type II.
5. Stimulate the bone to keep its density and muscle to be strong, preserve materials to keep them healthy and strong, and this can prevent osteoporosis and the injury brought thereabout.
6. Lower the incidence of hypertension, hyperlipidemia, diabetes type II, osteoporosis, cardiovascular diseases, and many other chronic diseases and mortality.
7. Enhance the utilization of nutritional materials and metabolism, improve one's nutrition.
8. Increase the high-density lipoprotein to low-density lipoprotein ratio.
9. Physical exercising can also possibly increase one's dopamine, improve one's mood therefore good to health, it is the reason why one could recover more than he consumed after exercising. Keeping exercising can reverse many health problems brought by sedentary life, modify one's nutrition. Habitual physical exercising with good diet can keep one healthy for lifetime. When one had higher level of dopamine, he would also be more interested in learning, one could have better efficiency of learning learn and working, have higher level of dopamine thereby.

The effects of habitual physical exercise to preventing hypertension, hyperlipidemia, diabetes type II and osteoporosis are remarkable.

From the view of nutriology, where nutrition includes ingestion, digestion, utilization and metabolization, physical exercising is crucial to good nutrition as well, despite good diet. Only all four parts of the nutrition were good can one have good nutrition to keep healthy, and physical exercising is important to all the other three parts despite ingestion.

Use it or lose it, this law is also fit to our body and brain, this possibly is because spiritualism is true, we do exercise because we

like, and therefore improved our dopamine level, which makes our body be in healthier state with enough nutrients supply. Exercising may also be effective to make one get older more slowly, there are people who seem never to get old, possibly it is the effect of physical exercising, and it is healthy. Professor Zhōng Nán Shān is still muscular now when he is about 80, possibly Bruce Lee would same be younger than other people who didn't have habitual physical exercising and muscular if he is still living now.

Physical exercising is indispensable from health, moderate exercising combined with healthful foods are sufficient and necessary conditions for health. Learning is also important to health, only when one had enough knowledge could he know how to keep healthy by himself, and one would definitely choose health when he knew it, it is different whether one truly knew it, to know is too internalize the external material to be a part of himself. Health is also important to one's ability to learn, good nutrition is necessary for brain to function well.[2]

Conclusion

As human evolves, we gradually are more dependent on mental laboring rather than physical laboring. However, physical activity and keeping one's physical ability still make a difference to one's health. Habitual physical exercising can improve one's physical ability as well as make one healthier, it possibly is because human originally like to be in movement, therefore when one's ability to move got exercised, one's dopamine would be leveled up and this makes one be in better mood which makes healthy, together with healthful food to provide enough nutrients to recover after exercising, one can get over-recovery by resting after each time of exercise, as long as he likes the exercise. Each time after swimming I feel happy, this should be enough to show physical exercising can make one healthier as long as he likes it, and I can keep swimming moderately to make me more and more happy and healthy.

Habitual physical exercise, which should be the type that one likes and is proper, can promote the utilization of the nutrients one ingested, improves one's nutrition and good nutrition determines one's health. Physical exercise can improve a variety of functions in human body, the aerobic one have comprehensive improvement to one's body functions remarkably, e.g., one's maximal oxygen uptake, endurance, cardiopulmonary functions, capillary density which can also enhance the activities of LPL, and the sensitivity of muscle to insulin etc., such improvements are beneficial to health. When I was grade one, I found intermediate and long-lasting physical exercising can make my reading much faster and more effortless, calculation and repeating which requires working memory can be continued in larger capacity without writing, it seems the working memory could also be improved. Therefore, to combine habitual physical exercising and keep learning can make one healthy and happy in long term, one should learn to know that he likes learning and physical exercising by himself.

Habitual physical exercising can also prevent hypertension, hyperlipidemia, diabetes type II and osteoporosis etc. many chronic diseases, today we have no way to deal with these diseases. Each time after my habitual swimming I felt my brain get much more sufficient blood supply and works much more easily, the body is much more comfortable than when I stopped it for a long time, and there is also somewhat homey feeling of happiness thereafter, this should at least show that habitual physical exercising, with moderate intensity, lasting time, and frequency, can effectively make one heathier and healthier. Habitual physical exercising can modify one's cardiovascular functions, blood supply more clearly, and glucose metabolism in muscles, these effects can prevent one from getting hypertension, hyperlipidemia, and diabetes type II respectively, and it can also somehow increase one's bone density which can also prevent osteoporosis. I can also feel I get better mood, increase of dopamine, which is same feeling with that after drinking some alcohol (must be good one but can absolutely never be fake one, only ethanol from food is edible, methanol can cause blind or even death), this should show that to do physical exercise moderately can improve one's dopamine level therefore can make one healthier after enough rest with adequate nutrients, and this is helpful to improve one's health comprehensively.

Habitual physical exercising and healthful diet enable one to keep healthy by himself, as long as there is no problem about safety. And somehow habitual exercising can also make one younger, possibly higher level of dopamine makes one younger, now all people look younger and younger when they were at same ages as our older generation. Health can improve one's ability to think and learn and makes one live better and longer, and we need physical ability to be in existence to change our world and live, we always need physical exercising no matter how advanced we'd evolved.

Acknowledgment

None.

Funding

None.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

1. Astrand PO. Physical activity and fitness. *Am J Clin Nutr.* 1992;55(6 Suppl):1231S-1236S.
2. Garatachea N, Santos Lozano A, Hughes DC, et al. Physical Exercise as an Effective Antiaging Intervention. *Biomed Res Int.* 2017;2017:7317609.