



### Review Article

## NEED AND IMPORTANCE OF VYAYAMA IN PRESENT ERA: A CRITICAL REVIEW

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### ABSTRACT

*Ayurveda* dealing as a science of life speaks about physical, mental and social health. In *Ayurvedic* science *Vyayama* is included in daily regimen for the purpose of staying healthy. As per World Health Organization data, lack of physical activity is responsible for 6% deaths globally. Exercise helps in metabolism of free fatty acids and plays an important role to overcome obesity and obesity related disorders like type 2 diabetes and cardiac disease like CVD (cardiovascular disease) and many more other disorders like breast cancer, colon cancer, dementia and depression. In *Ayurvedic* aspect *Vyayama* stimulate *Agni* which prevents formation of *Ama* so it is helpful in prevention of many disorder. In this review it is described that *Vyayama* or physical activity is necessary for an individual in today's life and *Vyayama* or physical activity works for staying healthy and longevity.

### INTRODUCTION

*Ayurveda* is the most holistic and oldest traditional medicinal system available in the world today. For maintenance and promotion of health, role of *Vyayam* (exercise/structured physical activities) is of great importance. It emphasizes the unshakable connections between the body, mind and spirit. In *Ayurveda*, perfect health is defined as a balance between body, mind, spirit and social well being<sup>[1]</sup>. For an individual's health *Ayurveda* describe about *Vyayama* in daily regimen. *Vyayama*, or physical exercise, is an essential component of *Ayurveda* system of preventative health care, rejuvenation and longevity. *Ayurveda* suggests that a daily routine of proper physical activity, affects not only our body, but has a positive influence on our mind, emotions, senses and spirit. *Vyayama* or physical exercise is very much important in today's life to keep one healthy and disease free. As data presented by W.H.O. shows that physical inactivity is responsible for 6% of deaths globally - around 3.2 million deaths per year, including 2.6 million in low and middle income countries, and 6,70,000 of these deaths are premature.<sup>[2]</sup> Because of the many benefits for health of physical activity, recent analysis has suggested that reaching the recommended minimum level of physical activity compared with no activity was found to lead to a reduction in all-cause

mortality of 19 percent and this rises to 24 percent if an hour a day is spent in physical activity.<sup>[3]</sup> In addition, there is a 31% lower risk for all cause mortality in active individuals.<sup>[4]</sup> *Acharya charaka* has defined *Vyayama* in a very scientific way that *Vyayama* is a physical action which is desirable and is capable of bringing about bodily stability and strength is known as physical exercise. As knowing about the importance of *Vyayama*, *Acharya* has included it under daily regimen.

### Objectives

- To study various aspects of *Vyayama* and
- To establish its necessity for an individual in present scenario

### Material and methods

All the references regarding *Vyayama* are collected from *Bruhat Trayi* and *Laghu Trayi*, different lexicon present in central library & relevant matter described on journals, magazines and websites.

### How much *Vyayama* or physical activity is required

Both *Ayurveda* and modern science speak about the critical requirement of *Vyayama* or physical exercise according to human age and body condition. As described in *Ayurveda* that, *Vyayama* should be performed at the level of *Balardha* (half of strength),

when *Prana vayu* situated in heart comes out to mouth while performing exercise it is the sign of *Balardha*<sup>[6]</sup>. It is also mentioned that *Vyayama* (physical exercise) should be done until the perspiration occurs, increase in respiration rate occurs, feeling lightness of the body & increase in heart rate (tachycardia) occurs.<sup>[7]</sup>

According to ACSM (American College of Sports Medicine) and AHA (American Heart Association), the recommended guidelines for the amount of physical activity that individuals should engage in on a routine basis in order to obtain and/or maintain health and wellness, adults aged 18–65 years should perform moderate-intensity aerobic (endurance) physical activity for a minimum of 30 minutes on five days each week or vigorous-intensity aerobic activity for a minimum of 20 minutes on three days each week.<sup>[8]</sup>

### The impact of Vyayama on physical health

Exercise is important for maintaining physical fitness and can contribute positively to maintaining a healthy weight, building and maintaining healthy bone density, muscle strength and joint mobility, promoting physiological well-being, reducing surgical risks, and strengthening the immune system. As stated by *Acharya Sushruta*, *Vyayama* or physical exercise causes physical development, lustre, compactness of body parts, stimulation of digestive power, absence of idleness, firmness, lightness, cleanliness, tolerance to fatigue, exhaustions, thirst, heat, cold etc. and provides optimum immunity.<sup>[9]</sup>

Physical activity benefits many parts of the body - the heart, skeletal muscles, bones, blood (for example, cholesterol level), the immune system and the nervous system<sup>[10]</sup> and it can reduce many of the risk factors for NCDs (Non-Communicable Disease). These risk factors include reducing blood pressure, improving blood cholesterol levels and lowering Body Mass Index (BMI).

Physical activity plays very important role in many diseases, such as type 2 diabetes, heart disease and many cancers. The WHO estimates that physical inactivity is the fourth-leading risk factor for global mortality.<sup>[11]</sup> In all major *Ayurvedic* text, it is mentioned that cause of diabetes is sedentary life style and lack of physical exercise and so as World Health Organization data shows that physical inactivity is the principal cause of approximately 27% of type 2 diabetes.<sup>[12]</sup>

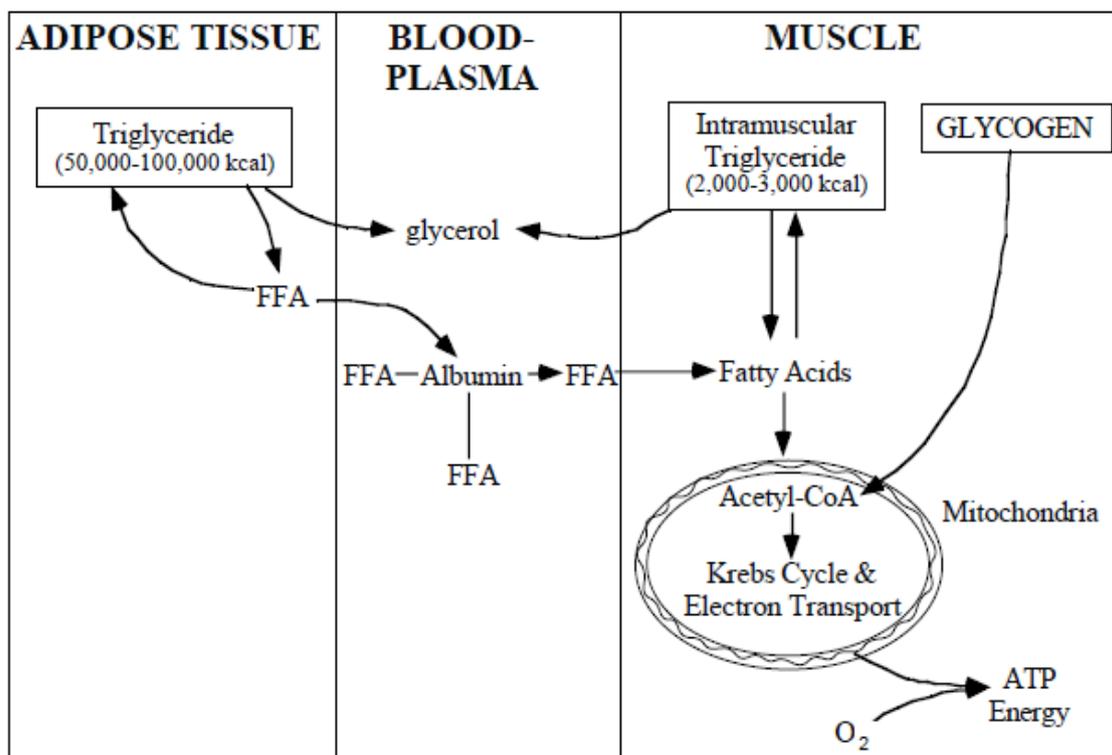
It is well known that there is a direct link between obesity and diabetes and some of heart diseases. Regular physical activity or exercise is advised to overcome the obesity because exercise works on fat metabolism. During exercise mobilization of the fatty acid occurs from the adipose tissues is increased and these free fatty acids are transported to the muscle mitochondria for the oxidation. Thus

exercise helps to decrease body fat and control obesity and other obesity related disorders.

According to *Acharya Charaka*, *Vyayama* or physical activity is indicated for the management of group of various disease termed as *Santarpana Janya roga*. *Prameha* is included under *Santarpana janya roga* and *Vyayama* or physical exercise interventions have been found effective in the management of diabetes. One prospective cohort study showed that walking at least 2 hours per week was associated with a reduction in the incidence of premature death of 39%–54% from any cause and of 34%–53% from cardiovascular disease among patients with diabetes.<sup>[13]</sup> *Acharya sushruta* has also indicated various type of physical activity for various caste for the management of *Prameha*.<sup>[14]</sup>

*Acharya Charaka* has also mentioned *Vyayama* or physical activity for the management of some cardiac disease in the person having optimum strength<sup>[15]</sup> and it is well proved that a routine physical activity is associated with improved psychological well-being (e.g., through reduced stress, anxiety and depression). Psychological well-being is particularly important for the prevention and management of cardiovascular disease. *Vyayama* or physical activity has important implications for the prevention and management of other chronic diseases such as osteoporosis, hypertension, obesity, cancer and depression. The probable cause may be changes in endothelial function or may be a particularly important adaptation to routine physical activity. Endothelial dysfunction has been observed with aging, smoking and multiple chronic disease states, including coronary artery disease, congestive heart failure, stroke, type 2 diabetes, hypertension, hypercholesterolemia and obesity.<sup>[16]</sup>

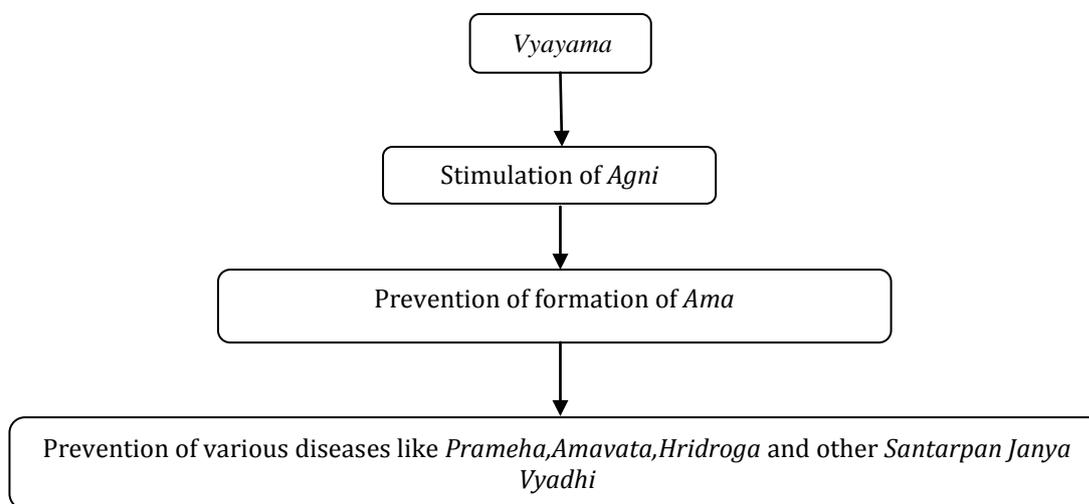
*Acharya Sushruta* has mentioned that there is no anti-obesity measure equal to physical exercise and same as shown by some study that routine physical activity has been shown to improve body composition (e.g., through reduced abdominal adiposity and improved weight control),<sup>[17]</sup> and enhance lipid lipoprotein profiles (e.g., through reduced triglyceride levels, increased high density lipoprotein [HDL] cholesterol levels and decreased low-density lipoprotein [LDL]-to-HDL ratios),<sup>[18]</sup> there is strong link between C-reactive proteins and some chronic inflammatory diseases. Recent RCTs have shown that exercise training may cause marked reductions in C-reactive protein levels.<sup>[19]</sup> According to *Charaka*, *Vyayama* is the one of the treatment in disease having *Shotha* (inflammation) because *Shotha* is *Santarpana janya roga*.



**Figure 1: Scheme of the storage and mobilization of the stored triglyceride**

Triglyceride from adipose tissue can be broken down to glycerol and free fatty acids (FFA), and FFA can be mobilized by binding to plasma albumin for transportation in the circulation to skeletal muscle and other tissues. Intramuscular triglyceride can also be broken down to glycerol and fatty acids, which enter the mitochondria for oxidation during exercise<sup>[20]</sup>.

*Ayurvedic* text believes that the root cause of all the disease is *Agni Mandya*.<sup>[21]</sup> And *Vyayama* is considered with the stimulation of *Agni* (digestive fire) which is essential for all the metabolic process at the cellular level. *Diptagni* prevents the formation of *Ama*, which is considered as the cause of many diseases. So by performing *Vyayama* or exercise daily one can keep away himself from many diseases.



**Diagram: Vyayama is helpful for prevention of diseases (Ayurvedic Aspect)**

As reviewed by Ivy, a series of changes (independent of changes in body mass) occur as a result of regular physical activity, including increased glycogen synthase<sup>[22]</sup> and hexokinase activity, increased GLUT-4 protein and mRNA expression, and improved muscle capillary density (resulting in

improved glucose delivery to the muscle). A series of mechanisms may explain 46% reduction in cancer rates observed with regular physical activity, including reductions in fat stores, increased energy expenditure offsetting a high fat diet,<sup>[23]</sup> activity-related changes in sex hormone levels, immune function, insulin and

insulin-like growth factors, free radical generation, and direct effects on the tumour.<sup>[24]</sup>

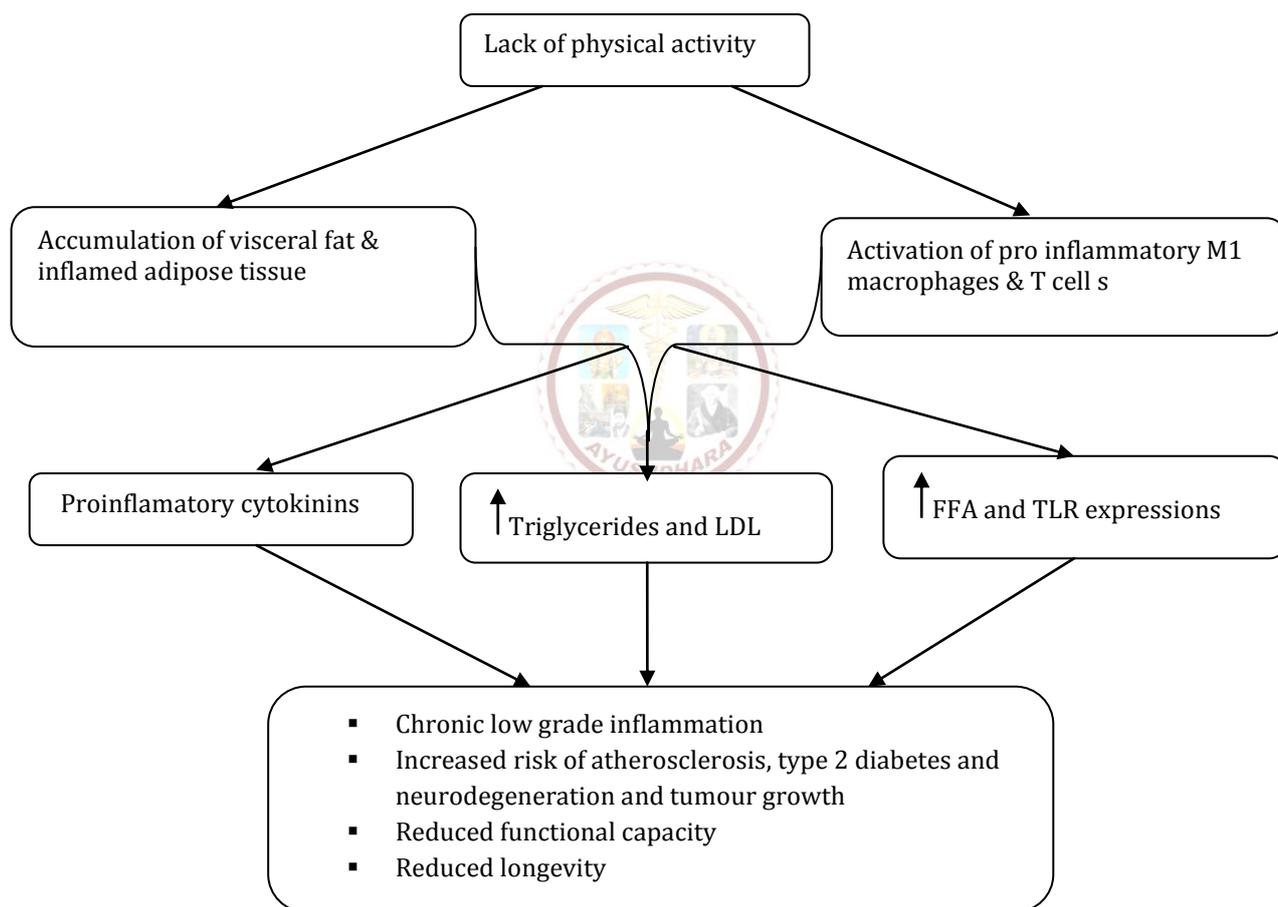
Even incompatible food, cooked or uncooked, is digested without any difficulty in persons performing exercise daily. Physical exercise is always wholesome for those who are strong and take unctuous food.<sup>[25]</sup>

*Ayurveda* describes two types of treatment simultaneously *Acharyas* have explained the two types of therapies i.e. *Samtarpana* (nutrition) and *Apatarpana* (reduction) which is to make thin person stout and stout person thin respectively. And in the *Apatarpana* (reduction) therapy, *Shamana* (palliative) therapy is recommended which also includes *Vyayama* (exercise)<sup>[26]</sup>. For the reason *Vyayama* or physical activity is also indicated for the management of *Urustambha* by *Acharya Charaka*.<sup>[27]</sup>

Developing research demonstrated that many of the benefits of exercise are mediated through the

role of skeletal muscle as an endocrine organ. The contracting muscles release multiple substances known as myokines which promote the growth of new tissue, tissue repair, and multiple anti-inflammatory functions, which in turn reduce the risk of developing various inflammatory diseases.<sup>[28]</sup>

Lack of physical activity leads to an accumulation of visceral fat and adipose tissue infiltration by pro-inflammatory macrophages and T cells. The pro-inflammatory M1 macrophages phenotypes predominates and inflamed adipose tissues release adipokinins and tumour necrosis factor (TNF) which causes a state of persistent low grade of systemic inflammation. This promotes the development of insulin resistance, tumour growth, neurodegeneration and atherosclerosis.



**Diagrammatic presentation: Lack of physical activity affects on human body**

**Vyayama and mental wellness**

*Acharya Sushruta* has mentioned that, by *Vyayama* one can get *Uttam aarogyam*, means well being at physical, mental and social level. *Vyayama* or physical activity acts on mental level, and researches shows that it has a very good effect on some psychological factors. Physical activity has been shown to be neuroprotective in many neurodegenerative and neuromuscular diseases.<sup>[29]</sup>

*Acharya charaka* has included *Vyayama* in daily regimen for the wellbeing of an individual. There is accumulating evidence that walking, and physical activity more generally, can be an effective way to enhance positive moods. For example, people with high levels of regular physical activities shows higher levels of positive emotions such as interest, excitement, enthusiasm and alertness compared to people with moderate and low levels of physical activity by increasing chemicals in the brain that help cognition,

such as dopamine, glutamate, norepinephrine, and serotonin.<sup>[30]</sup>

On the other hand *Vyayama* or exercise also shows promising results in brain related disorders. Epidemiological studies suggest that exercise reduces the risk of Parkinson's disease, and regular physical activity is shown to improve the quality of life in Parkinson's disease patients and reduce their neurological symptoms. However, there is limited evidence on the exact cognitive processes and again further studies need to be done.

There is also some evidence that physical activity may help to slow the progression of Alzheimer's and reduce its risk through a number of mechanisms such as promoting vascular health by lowering blood pressure and reducing other risk factors that lead to the disease.<sup>[31]</sup>

Several studies have focused specifically on people with schizophrenia and a review of three such randomised controlled physical activity interventions found that physical exercise improves negative symptoms of schizophrenia compared to standard care.

A review of 16 studies which included a physical activity intervention for people with severe mental illness found physical activity can contribute to improved quality of life through social interaction, meaningful use of time, purposeful activity and empowerment.

Researches prove that physical activity can improve brain plasticity, or the capacity of the brain to develop new neural pathways and for new neurons to grow during adulthood. This effect seems to be particularly strong in the hippocampus (an area of the brain involved in memory) and frontal cortex (involved in movement, decision-making, problem solving, and planning). Increased brain plasticity has been suggested as a mechanism by which physical activity enhances brain functioning, especially in later life, and protects against neurodegenerative diseases, such as dementia.<sup>[32]</sup>

#### Side effects of over exercise or *Ati-Vyayama*

However *Vyayama* or exercise is beneficial for individual at both physical and psychological level but over indulgence in *Vyayama* can be harmful. *Vyayama* (exercise) should be performed after considering age, physique, place, time and diet otherwise one is afflicted with severe disorder.<sup>[33]</sup> Too much exercise can be harmful and without proper rest, the chance of stroke or other circulation problems increases<sup>[34]</sup> and muscle tissue may develop slowly. Extremely intense, long-term cardiovascular exercise, seen in athletes who train for multiple marathons, has been associated with scarring of the heart and heart rhythm abnormalities.<sup>[35]</sup> *Ayurvedic* text also mention over exercise as a causative factor for heart disease.<sup>[36]</sup> In extreme instances, over-exercising induces serious performance loss. Unaccustomed overexertion of

muscles leads to rhabdomyolysis most often seen in new army recruits.<sup>[37]</sup> Too much exercise may cause a woman to miss her period (menstrual cycle), a symptom known as amenorrhea<sup>[38]</sup>

#### Contraindications of *Vyayama*

There are some conditions in which *Acharya* has clearly stated that *Vyayama* is strictly contraindicated to the person suffering from intrinsic haemorrhage, emaciation, consumption, dyspnoea, cough and wound, after taking food, involved sex and afflicted with thirst and giddiness.<sup>[39]</sup>

#### CONCLUSION

*Vyayama* plays an important role to keep one healthy at physical, mental and social level. Lack of physical activity or *Vyayama* is related to many kind of physical and mental disorders. Serious life style related disorders like diabetes, heart disease and some other diseases have a direct link with no physical activity or *Vyayama*. In *Ayurvedic* system of medicine it is well described about *Vyayama* and its authenticity is proved by various modern researchers so one can keep healthy himself or herself by performing *Vyayama* in his or her daily life.

#### REFERENCES

1. Susruta, susruta samhita, sutrasthana doshadhatumalakshayavridhhi adhyaya 15/48, chaukhambha sanskrita sansthana, Varanasi, edition 14 vikramasamvata 2060; p-64
2. World Health Organization, Global Recommendations on Physical Activity for Health (WHO, 2011): [http://whqlibdoc.who.int/publications/2010/9789241599979\\_eng.pdf](http://whqlibdoc.who.int/publications/2010/9789241599979_eng.pdf)
3. Woodcock, J., O.H. Franco, N. Orsini and I. Roberts, 'Non-vigorous physical activity and all-cause mortality: systematic review and meta-analysis of cohort studies', Int J Epidemiol 2011, 40(1): 121-38: <http://www.ncbi.nlm.nih.gov/pubmed/20630992>
4. Warburton, D.E.R., S. Charlesworth, A. Ivey, L. Nettlefold and S.S.D. Bredin, 'A systematic review of the evidence of Canada's Physical Activity Guidelines for Adults', Int J Behav Nutr Phys Act 2010, 7: 39:<http://www.biomedcentral.com/content/pdf/1479-5868-7-39.pdf>
5. Agnivesh, Charaka, charakasamhita, Sutra sthan navegaqndharniyaadhyay 7/31 Chaukhambha surbharati publication, Varanasi, p-175
6. Susruta, susrutasamhita, chikitsa sthana anagatabadhpratishediyamadhyaya 24/47, chaukhambha sanskrita sansthana, Varanasi, edition 14 vikramasamvata 2060; p-107
7. Agnivesh, Charaka, charakasamhita, Sutra sthan navegaqndharniyaadhyay 7/33,

- Chaukhambha Surbharati publication, Varanasi, p-177
8. Haskell, W.L., I.M. Lee, R.R. Pate, K.E. Powell, S.N. Blair, B.A. Franklin, C.A. Macera, G.W. Heath, P.D. Thompson and A. Bauman, 'Physical activity and public health: updated recommendation for adults from American College of Sports Medicine and the American Heart Association', *Med Sci Sports Exercise* 2007, 39(8): 1423-34: <http://circ.ahajournals.org/cgi/content/abstract/CIRCULATIONAHA.107.185649v1>.
  9. Susruta, susrutasamhita, chikitsa sthana anagatabadhpratishediyamadhyaya 24/40, chaukhambha sanskrita sansthana, Varanasi, edition 14 vikramasamvata 2060; p-107
  10. For a comprehensive overview of the benefits of physical activity on the body, see Professional Associations for Physical Activity, *Physical Activity in the Prevention and Treatment of Disease* (2nd edition, Swedish National Institute of Public Health), 2010, chapter 1: <http://www.fhi.se/en/Publications/All-publications-in-english/Physical-Activity-in-the-Prevention-and-Treatment-of-Disease/>
  11. World Health Organization slide set, 'Global Health Risks: Selected figure and tables': [www.who.int/entity/healthinfo/global\\_burden\\_disease/global\\_health\\_risks\\_report\\_figures.ppt](http://www.who.int/entity/healthinfo/global_burden_disease/global_health_risks_report_figures.ppt)
  12. World Health Organization: *Global Health Risks: Mortality and Burden of Disease attributable to Selected Major Risks* (Geneva, World Health Organization), 2009:
  13. Gregg EW, Gerzoff RB, Caspersen CJ, et al. Relationship of walking to mortality among US adults with diabetes. *Arch Intern Med* 2003; 163:1440-7.
  14. Susruta, susrutasamhita, chikitsa sthana pramehachikitsam adhyaya 11/12, chaukhambha sanskrita sansthana, Varanasi, edition 14 vikramasamvata 2060; p-62
  15. Agnivesh, Charaka, charakasamhita, Sutra sthan langhanbrhinganियाadhyay 22/23, Chaukhambhamsurbharati publication, Varanasi, p-416
  16. Maiorana A, O'Driscoll G, Taylor R, et al. Exercise and the nitric oxide vasodilator system. *Sports Med* 2003;33:1013-35.
  17. Warburton DE, Gledhill N, Quinney A. The effects of changes in musculoskeletal fitness on health. *Can J Appl Physiol* 2001;26:161-216.
  18. Berg A, Halle M, Franz I, et al. Physical activity and lipoprotein metabolism: epidemiological evidence and clinical trials. *Eur J Med Res* 1997;2:259-64.
  19. Nicklas BJ, You T, Pahor M. Behavioural treatments for chronic systemic inflammation: effects of dietary weight loss and exercise training. *CMAJ* 2005;172(9):1199-209.
  20. <http://bmsi.ru/doc/2d48a3e3-807a-404a-b3a7-ddb04c1e2841>
  21. Astang Hridayam, Vagbhatta, Nidan Sthana, Udaranidanam 12/1, Choukhambha Sanskrit Pratisthana, p-513
  22. Christ-Roberts CY, Pratipanawatr T, Pratipanawatr W, et al. Exercise training increases glycogen synthase activity and GLUT4 expression but not insulin signaling in overweight nondiabetic and type 2 diabetic subjects. *Metabolism* 2004;53:1233-42.
  23. Shephard RJ, Fitcher R. Physical activity and cancer: How may protection be maximized? *Crit Rev Oncog* 1997;8:219-72.
  24. Westerlind KC. Physical activity and cancer prevention - mechanisms. *Med Sci Sports Exerc* 2003;35:1834-40.
  25. Susruta, susrutasamhita, chikitsa sthana anagatabadhpratishediyamadhyaya 24/45, chaukhambha sanskrita sansthana, Varanasi, edition 14 vikramasamvata 2060; p-107
  26. Agnivesh, Charaka, charakasamhita, Sutra sthan santarpaniyadhyaya 23/25, Chaukhambha surbharti prakashan, p-424
  27. Agnivesh, Charaka, charakasamhita, Chikitsa sthan Urustambha chikitsatamadhyaya 27/59, Chaukhambha Bharti Academy, Varanasi, p-774
  28. Muscle as a secretory organ. Pedersen BK. *American Physiological Society. Compr Physiol* 3:1337-1362, 2013.
  29. Grondard C, Biondi O, Armand AS, Lécolle S, Della Gaspera B, Pariset C, Li H, Gallien CL, Vidal PP, Chanoine C, Charbonnier F (2005). "Regular Exercise Prolongs Survival in a Type 2 Spinal Muscular Atrophy Model Mouse". *The Journal of Neuroscience*. (Abstract) 25(33): 7615-7622.
  30. Parker-Pope, T. (2001). For a Healthy Brain You Really Need to Use Your Head - Physical and Mental Exercise Can Stave Off Mental Decline. *The Wall Street Journal Europe, November 26, 2001*, 8. Retrieved October 5, 2006, from ProQuest database
  31. Hamer, M. and Y. Chida, 'Physical activity and risk of neurodegenerative disease: a systematic review of prospective evidence', *Psychol Med* 2009 39(1): 3-11: <http://www.ncbi.nlm.nih.gov/pubmed/18570697>; J. Burns et al., 'Cardiorespiratory fitness and brain atrophy in early Alzheimer disease', *Neurology* 2008 71: 210-16 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2657657/>
  30. Erickson KI, Gildengers AG & Butters MA (2013). Physical activity and brain plasticity in late adulthood. *Dialogues in clinical neuroscience*, 15(1) p. 99.

31. Agnivesh, Charaka, charakasamhita, Sutra sthan navegaqndharniyaadhyay 7/33, Chaukhambha surbharati publication, Varanasi, p-176
32. Alexander, C. 1998. Cutting weight, losing life. News & Observer, February 8, 1998, A.1. Retrieved October 5, 2006, from ProQuest database.
33. Benito B, Gay-Jordi G, Serrano-Mollar A, Guasch E, Shi Y, Tardif JC, Brugada J, Nattel S, Mont L (2011). "Cardiac arrhythmogenic remodeling in a rat model of long-term intensive exercise training". Circulation 123 (1): 13-22.
34. Agnivesh, Charaka, charakasamhita, Chikitsa sthan trimarmiyaadhyaya 26/77, Chaukhambha Bharti Academy, Varanasi, p-731
35. Jimenez C., Pacheco E., Moreno A., Carpenter A. (1996). "A Soldier's Neck and Shoulder Pain". The Physician and Sportsmedicine 24 (6): 81-82.
36. Julia Berry; Anne Bradley; Hillery Magness. "Amenorrhea". The Female Athlete Triad. University of Oregon, Department of Human Physiology. Retrieved 2007-08-14.
37. Agnivesh, Charaka, charakasamhita, Sutra sthan navegaqndharniyaadhyay 7/33, Chaukhambha surbharati publication, Varanasi, p-176

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