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An insight to vyayama: Ayurvedic preview of physical exercise

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Abstract

Introduction: Healthy long life is a dream of every human. Ayurveda is among the earliest sciences that has emphasized on longevity. *Vyayama* (Physical exercise) is *Ayukameeya* (promoter of longevity) and one among *Dinacharya* (daily regimen) which can also be used as *Anagatabaada pratisheda* a therapeutic tool to combat many of the modern day diseases. One must be very cautious about it because *vyayama* when used in a proper way endeavors supreme health but kills when it is improper. **Materials and methods:** A conceptual review in the classical texts of Ayurveda, textbooks of contemporary sciences and the national and international journal regarding the *Ayurvedic* perspective of physical exercise. Keywords like *vyayama*, physical exercise, exercise were searched in major databases and *E-samhitas*, obtained results were critically analysed in terms of Preventive, Promotive and Protective benefits of *vyayama*.

Results & Discussion: Ayurveda describes promotive benefits of *vyayama* like it produces lightness in the body, provides ability to bear troubles, and curative benefits like reduces aggravated Dosha and improves the digestive power and solid built to body. *Vyayama* is primordial prevention in its purest sense, but also plays a potential role in Primary Secondary and Tertiary prevention.

Conclusion: Strong evidences shows that physical inactivity increases the risk of many adverse health conditions. It is the 3rd leading cause of death NCDs due to physical inactivity are the significant cause of increasing global mortality which has increased the death rate from 20 – 30 % in the last decade. Hence *vyayama* is the need of the hour, It is no less to a medicine, which is evident by the number of times the term *vyayama* appeared in *brihatrayi*, and hence it has to be practiced properly to achieve healthy and long life.

Keywords: *Vyayama*, Physical exercise, Preventive medicine, *Swasthavritta*, Ayurveda

Introduction

Healthy long life is a dream of every human. Ayurveda is among the earliest sciences that has emphasized on longevity, the very first chapter of *charaka samhita* is *Dheerganjeevitiya adhyaya*, which means the chapter on healthy and long life. *Ashtanga hridaya* starts with *Ayukameeya Adhyaya*, which means the chapter on desire for longevity. The prime motto of Ayurveda are enduring longevity to healthy and curing morbidity of diseased ^[1]. *Swasthavritta* the branch of Ayurveda explains unique concepts like *Dinacharya*, *Rutucharya*, *Sadvritta* and *Rasayana* which prevents disease and promote the health throughout ones life.

Vyayama (Physical exercise) is *Ayukameeya* (promoter of longevity) and one among *Dinacharya* (daily regimen) which can also be used as *Anagatabaada pratisheda* a therapeutic tool to combat many of the modern day diseases. It is best among immune boosters as mentioned in *Astanga hrudaya*, it is also one among the diagnostic tool explained in *charaka samhita dashavidha Pariksha* as to examine the strength of a person by his *vyayama Shakti* ^[2].

It is also very fascinating to note that Ayurveda quotes *vyayama* in many of the *upamaanas* to highlight the doctrine of signature, the goat which walks and works a lot, eats lighter diet so as its milk is lighter to digest and is potent enough to cure most of the disease^[3], whereas the buffalo that seldom does exercise so as its milk is heavy to digest, causes lethargy/ excessive sleep and can lead to obesity^[4]. The other context quotes, one who practices adequate *vyayama* can prevent even his enemies to attack on him just like all animals fears to go near lion^[5], whereas in the fight between an elephant and a lion eventually both gets exhausted due to exertion, the same way a man practicing excessive exercise may die of exertion^[6]. *Charaka samhita* specifies it clearly that *vyayama* must be in *Matra* i.e proper quantity^[7]. One must be very cautious about it because *vyayama* when used in a proper way endeavors supreme health but kills when it is improper. The present modern world is ruined with deadly non communicable diseases. These are also called lifestyle diseases, as most of the time they are caused by improper and unhealthy lifestyle. In man's marathon of modernization, where machines work more than man has led to an increased sedentary lifestyle in most of the jobs, due to which NCDs like Diabetes, Hypertension, Obesity and Cardiac diseases are booming day by day. It is also very fascinating to note that Ayurveda quotes *vyayama* in many of the *upamaanas* to highlight the doctrine of signature, the goat which walks and works a lot, eats lighter diet so as its milk is lighter to digest and is potent enough to cure most of the disease^[3], whereas the buffalo that seldom does exercise so as its milk is heavy to digest, causes lethargy/ excessive sleep and can lead to obesity^[4]. The other context quotes, one who practices adequate *vyayama* can prevent even his enemies to attack on him just like all animals fears to go near lion^[5], whereas in the fight between an elephant and a lion eventually both gets exhausted due to exertion, the same way a man practicing excessive exercise may die of exertion^[6]. *Charaka samhita* specifies it clearly that *vyayama* must be in *Matra* i.e proper quantity^[7]. One must be very cautious about it because *vyayama* when used in a proper way endeavors supreme health but kills when it is

improper. The present modern world is ruined with deadly non communicable diseases. These are also called lifestyle diseases, as most of the time they are caused by improper and unhealthy lifestyle. In man's marathon of modernization, where machines work more than man has led to an increased sedentary lifestyle in most of the jobs, due to which NCDs like Diabetes, Hypertension, Obesity and Cardiac diseases are booming day by day.

Researchers have found that hypertension, obesity and diabetes are the most common underlying medical conditions in Covid-19 patients. These co morbidities are frequently cited as risk factors for severe Covid-19 outcomes. The WHO reported that around 3.2 million deaths each year are attributable to physical inactivity^[8]. Five leading risk factors for death are high blood pressure, smoking, high blood glucose, physical inactivity and obesity^[9]. This is need of the hour to realize the importance of physical exercise and practice it as a daily regimen.

Materials and methods

A conceptual review in the classical texts of Ayurveda, textbooks of contemporary sciences and the national and international journal regarding the Ayurvedic perspective of physical exercise. Keywords like *vyayama*, physical exercise, exercise were searched in major databases and E-samhitas, obtained results were critically analysed in terms of Preventive, Promotive and Protective benefits of *vyayama*.

Results & Discussion

Ayurveda simply defines *Vyayama* as any work that brings out some tiredness to body^[10]. Where dictionary meanings has suggests basic meaning of *Vyayama* as to pull or drag or draw. M.M. Williams has quoted some important meanings of exercise i.e. strength or struggle^[11], make great effort, exertion, take exercise. Apte Vaman has suggested some other important meanings of *Vyayama* i.e. contention, struggle, extending out, stretching out, gymnastic or athletic exercise, fatigue, labor effort exertion and a measure of distance^[12].

Table 1: References of the term *Vyayama* in *Brihatrayi*.

Samhita	No.	Vyayama					
Charaka Samhita	72	च.सू.५/८६ च.सू.६/२९ च.सू.६/३६ च.सू.७/३१ च.सू.७/३३ च.सू.७/३४ च.सू.७/३४ च.सू.७/३५ च.सू.८/१८ च.सू.१३/५२	च.सू.१४/६४ च.सू.१४/६७ च.सू.१७/३० च.सू.१७/७९ च.सू.१७/९२ च.सू.२१/१३ च.सू.२१/१९ च.सू.२१/२८ च.सू.२६/१०६ च.सू.१३/६३	च.सू.२१/२९ च.सू.२२/१८ च.सू.२३/८ च.सू.२३/२५ च.सू.२५/४० च.सू.२७/५८ च.सू.२७/३१५ च.सू.२८/२८ च.सू.१२/३ च.सू.२६/९६	च.सू.२९/७ च.नि.१/१९ च.वि.३/३३२ च.वि.५/२१ च.वि.६/५० च.वि.६/६१ च.वि.७/५ च.वि.१३/२९ च.शा.८/२४ च.शा.८/३८	च.वि.१४/१३ च.वि.१६/१२५ च.वि.१७/३४ च.वि.२०/७ च.वि.२१/११५ च.वि.२४/२८ च.वि.२४/१६ च.वि.२४/१८५ च.वि.२६/३२ च.वि.२६/७६	च.सि.१२/१५ च.नि.४/५ च.नि.४/३६ च.नि.५/६ च.नि.६/४ च.वि.४/८ च.वि.८/४० च.वि.८/९४ च.वि.८/१२१ च.शा.८/२१
		सू.सू.५/३९ सू.सू.१५/३३ सू.सू.१६/१६ सू.सू.१९/२० सू.सू.२०/२२ सू.सू.२१/१९ सू.उ.५०/४	सू.सू.२६/१३ सू.सू.३५/३६ सू.सू.३५/४० सू.सू.४५/४९ सू.नि.१/४० सू.नि.५/३ सू.उ.५२/११	सू.नि.९/१६ सू.नि.११/८ सू.शा.३/१६ सू.शा.८/२४ सू.वि.३/४ सू.वि.४०/५१ सू.वि.४०/५२ सू.उ.४४/४०	सू.वि.३/२५ सू.वि.५/१७ सू.वि.८/५४ सू.वि.११/११ सू.वि.१९/३ सू.वि.२४/३८ सू.उ.६४/१० सू.उ.६४/३६	सू.वि.२४/४३ सू.वि.२४/४४ सू.वि.२४/४८ सू.वि.२४/४९ सू.वि.२४/५० सू.वि.३१/१७ सू.वि.३२/१५	सू.क.६/३१ सू.उ.१७/८१ सू.उ.३९/१५७ सू.उ.३९/१६० सू.उ.४१/२२ सू.उ.४१/२४ सू.उ.४७/१५
Astanga Hrudaya	21	अ.ह.सू.२/१३ अ.ह.सू.२/१४ अ.ह.सू.४/१८ अ.ह.सू.५/२४	अ.ह.सू.७/४७ अ.ह.सू.१३/११ अ.ह.सू.१६/१० अ.ह.सू.१६/२६	अ.ह.सू.१८/५३ अ.ह.सू.१९/३४ अ.ह.सू.२९/७८ अ.ह.शा.५/२२	अ.ह.शा.५/५१ अ.ह.नि.१/१५ अ.ह.नि.९/३५ अ.ह.नि.१६/१९	अ.ह.वि.१/१७४ अ.ह.वि.७/११४	अ.ह.वि.१६/४६ अ.ह.क.४/५१ अ.ह.उत्तर.२७/३५
Astanga Sangraha	30	अ.सं.सू.३/३३ अ.सं.सू.३/३७ अ.सं.सू.५/१७ अ.सं.सू.६/२९ अ.सं.उत्तर.३२/३८	अ.सं.सू.९/२३ अ.सं.सू.१०/३२ अ.सं.सू.१३/२२ अ.सं.सू.१९/१५ अ.सं.शा.६/२२	अ.सं.सू.२२/२३ अ.सं.सू.२४/१५ अ.सं.सू.२५/११ अ.सं.सू.२५/३१ अ.सं.शा.६/५१	अ.सं.सू.२६/१६ अ.सं.सू.२६/२४ अ.सं.सू.२७/५२ अ.सं.सू.२८ अ.सं.सू.२८/३४	अ.सं.सू.२९/२१ अ.सं.सू.३७/१५ अ.सं.सू.३८/४१ अ.सं.शा.२/५६ अ.सं.शा.३/२३	अ.सं.नि.१/२४ अ.सं.नि.१६/१७ अ.सं.वि.२/७६ अ.सं.वि.९/५६ अ.सं.वि.१८/२६

Vyayama is explained in multiple dimensions in Ayurveda, it is attributed as health promoter, disease preventer, clinical tool to cure many diseases when done properly, as well as a causative agent too many diseases when it is done improperly.

Vyayama as Health promotor

Ashtanga hridaya describes promotive benefits like it produces lightness in the body, provides ability to bear troubles, and curative benefits like reduces aggravated Dosha and improves the digestive power and solid built to body. *Charaka samhita* has described that the effort which produces stability and strength in the body is known as *Vyayama* [13]. It is defined in *sushrut samhita* as the activity which produces *Ayasa* (tiredness) in the body is known as *Vyayama* [8]. *Vyayama* nourishes the body, gives good complexion, it enhances the digestive fire, kills lethargy and bestow the strength to withstand the thirst, hunger, hot, cold and pain [14].

Vyayama as Disease priverive

The disease can be prevented by opposing its natural history at different levels. Levels of prevention are,

1. Primordial prevention
2. Primary prevention
3. Secondary prevention

Tertiary prevention

Vyayama as Primordial Prevention

Vyayama is primordial prevention in its purest sense, that is, prevention of the emergence or development of risk factors in countries or population groups in which they have not yet appeared [15]. For example, many adult health problems (e.g., obesity, hypertension) have their early origins in childhood, because this is the time when lifestyles are formed (for example, smoking, eating patterns, physical exercise). In primordial prevention, efforts are directed towards discouraging children from adopting harmful lifestyles. Incorporating adequate exercise in routine of children will produce the healthy and fit human resource for future. Research data proved overall health, fitness and quality of life has greatly improved in the sample who practiced physical exercises daily [16]. The main intervention in primordial prevention is through individual and mass education. E.g. Hamara Ayush Hamara Swasthya: the campaign launched by Ayush ministry as a part of Azadi ka Amrit mahotsav, to reach Ayurveda to primary and high school children.

Vyayama as Primary Prevention

Primary prevention can be defined as action taken prior to the onset of disease, which removes the possibility that a disease will ever occur' [17]. It signifies intervention in the pre-pathogenesis (SANCHAYA AVASTHA) phase of a disease or health problem or other departure from health. *Sushruta samhita* quotes there is nothing equal to *vyayama* in preventing *Sthoulya*, *Jara* and *Mrutyu* [18], interestingly *vyayama* has also been attributed to prevent the attacks of enemies and predators with simily like how the animals fear to come near lion the same way enemies (diseases causing agents) fear to come near one who practices exercise daily[5]. The concept of primary prevention is now being applied to the prevention of chronic diseases such as coronary heart disease, hypertension and cancer based on elimination or modification of "risk factors" of disease. Clinical studied

showed the improvement in the ability of muscles to pull oxygen out of the blood that reduces the need of heart to pump more blood. Evidences also reveal significant reduction in stress hormones that puts extra burden on the heart. It works like a beta blockers to slow the heart and lower the blood pressure [19]. The WHO has recommended the following approaches for the primary prevention of chronic diseases where the risk factors are established [20]:

- Population (mass) strategy- Health Promotion.
- High-risk strategy- Specific protection.

Population strategy- Health Promotion

"Population strategy" which is directed at the whole population irrespective of individual risk levels. For example, studies have shown that even a small reduction in the average blood pressure or serum cholesterol of a population would produce a large reduction in the incidence of cardiovascular disease. Hence *Vyayama* incorporated in community level will bring a greater difference [21].

High-risk strategy- Specific protection

The high-risk strategy aims to bring preventive care to individuals at special risk. This requires detection of individuals at high risk by the optimum use of clinical methods, for example in Obesity as Family problem, advising Exercises can benefit largely. Regular exercise is also advisable to the individuals with high family risk of cardiovascular diseases and diabetes. Chair exercise/Yoga at work place is a new initiative by Ministry of AYUSsH that aimed to reduce sedentary lifestyle in IT professionals.

Vyayama as Secondary prevention

Secondary prevention can be defined as "action which halts the progress of a disease at its incipient stage and prevents complications"[22]. The specific interventions are early diagnosis (e.g., screening tests, case finding programmes) and adequate treatment. Secondary prevention is largely the domain of clinical medicine. *Sushruta samhita* says "there is no better medicine than *Vyayama* to beat obesity [23] *Vyayama* acts as a non-pharmacological intervention in Type 2 Diabetes, Hypertention as a part of treatment and *Yogasana* & *Pranayama* as adjuvant therapies in wide Verity of illnesses. Researches have proved the significant impact of exercise on triglyceride level, LDL & HDL levels. A significant reduction in BMI and waist circumference was also evident [24].

Vyayama as Tertiary prevention

Tertiary prevention can be defined as "all measures available to reduce or limit impairments and disabilities [25], minimize suffering caused by existing departures from good health and to promote the patient's adjustment to irremediable conditions" *Mrudu Vyayama* done in *Pakshaghata*, *Apabahuka* and *Urusthamba* will improve the range of Movements and prevents complications and further worsening.

Vyayama as Nidana (Disease causing factor)

Vyayama is no less regarded as a medicine in Ayurveda, the same way how a good medicine when not properly used acts as a deadly poison, so as *Vyayama* [26]. Inadequate or excess of *Vyayama* is a cause appeared in maximum number of *Sroto dusti hetu*. It can potentially vitiate *pranavaahasrothas*, *raktavaahasrothas*, *mamsavaahasrothas*, *medhovahasrothas*,

asthivahasrothas, and *swedovahastroras* [27]. *Vyayama* done in excess will cause dryness of mouth and thirst, debility, exertional dyspnea, fatigue, cough, fever and vomiting [28]. Excess of *vyayama* vitiates *vata*, absence of *Vyayama* vitiates *Kapha* and inappropriate / irregular *Vyayama* vitiates *Pitta*. Excess *Vyayama* leads to Emaciation and *apatarpana janya vyadhi* whereas absence of *Vyayama* leads to Obesity and *Santarpana janya vyadhi* [29]. *Vyayama* is also seen as *nidan* of *Kusta*, *Rajyakshma*, *Vataja jwara*, *Vatarakta*, and *Yonivyapad* and *Avyayama* causes *Sthoulya*, *Prameha* and *medhorogas*.

To understand the action of *Vyayama* on *dosha*, i.e how *vyayama* can increase *vaata* and *Avyayama* increase *kapha*, one must go in depth on *Samanya Vishesh* *siddhantha* explained in *Charaka Samhita*. It says *samanya* is *kaarana* for *vrudhi* always in all factors [30]. *charaka samhita* have explained 3 kinds of *samanya*, *Dravya samanya*, *Guna samanya*, *Karma samanya*. *Mamsaahara* increasing *mamsa dhatu* is *dravya samanya*, *snehatva* of *shareera* is increased by *sneha guna* of *Ksheera* is *Guna samanya*, however *Vata* increased due to *Vyayama* and *Kapha* increased due to *Avyayama* can't be directly understood as *Karma samanya*, here there is nothing in common which is responsible for this *vrudhi*. This is explained by *chakrapani* as *Anubhava vrutti Samanya*. *Dravya samanya* and *Guna samanya* are *Ubhaya vrutti samanya* where there is a direct relation found between *poshya* and *poshaka* but *Vyayama* is *Anubhava vrutti samanya*. it can be understood in a way a moving that *chalatva* is prime attribute of *Vaata dosha* and *Vyayama* as well, hence the *chalana karma* of *Vyayama* is responsible for *Vata vrudhi*, but the same is not acceptable in the case of *Kapha*, as *Avyayama* have nothing common with *kapha*, however the absence of *vaata* in *Avyayama* is responsible for *vrudhi* of *Kapha* this is called *Anubhava vrutti samanya*. *Diwaswapna* which is *parama dosha* *karaka*, becomes *anabhisyanda* when slept on moving objects like swing or while travelling, here due to *chalanqa karma* *kapha* will not be aggravated [31].

Special considerations during vyayama

There are many factors like *Prakruti*, *Kaala*, *Bala*, *Desha* and *Dosha* etc to be considered to decide to what an extent an individual can do *Vyayama*, however *vayama* has to be stopped once Perspiration, enhanced respiration, lightness of the body, inhibition of the heart and other organs of the body are seen [32], these are indicative of the exercise being performed correctly. Person having good strength and eats unctuous food daily can practice *Vyayama* to half of one's strength whereas the others must practice it a little [33], it can be practiced to good strength during winter however has to be practiced very little in other seasons [34].

Table 2: Factors influencing Vyayama

	<i>Mrudu Vyayama</i>	<i>Madyama Vyayama</i>	<i>Uttama Vyayama</i>
<i>Prakruti</i>	<i>Vaataha</i>	<i>Pitta</i>	<i>Kapha</i>
<i>Kaala</i>	<i>Greeshma</i>	<i>Varsha Sharad</i>	<i>Hemanta Sishimra Vasant</i>
<i>Desha</i>	<i>Jaangala</i>	<i>Sadharana</i>	<i>Anupa</i>
<i>Bala</i>	<i>Alpa</i>	<i>Madyama</i>	<i>Uttama</i>

Contraindications of Vyayama

There are the conditions mentioned in Ayurveda in which exercise should not be performed. Individuals who are having *Raktapitta*, *Shwasa*, *Kasa* and are excessively weak should

not practice *vyayama*. Individuals indulged in excessive sexual activities, one who bears excessive weight, excessively weak persons, elderly persons and individuals having *Vata vyadhi*, should not practice *Vyayama* [35]. It is also contraindicated to practice *vyayama* during *Snehapana* and *Shodana* [36].

Conclusion

Vyayama is explained in multiple dimensions in Ayurveda, including its promotive, preventive and curative aspects. Strong evidences shows that physical inactivity increases the risk of many adverse health conditions. Physical inactivity is the 3rd leading cause of death NCDs due to physical inactivity are the significant cause of increasing global mortality which has increased the death rate from 20 – 30 % in the last decade. Hence *vyayama* is the need of the hour, It is no less to a medicine, *vyayama* can be attributed as the pioneer of non-pharmacological therapy which is evident by the number of times the term *vyayama* appeared in *brihatrayi*, and hence it has to be practiced properly to achieve healthy and long life.

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