



## Review Article

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### LIFESTYLE DISORDERS IN CHILDREN: AN AYURVEDIC OVERVIEW

Kalpana Patni <sup>1\*</sup>, Anu Gupta <sup>2</sup>

<sup>1</sup> Assistant Professor, Department of Kaumarabhritya, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India

<sup>2</sup> Assistant Professor, Department of Kayachikitsa, Desh Bhagat Ayurvedic College and Hospital, Mandi Govindgarh, Punjab, India

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#### \*Corresponding author

E-mail: kalpana.patni@gmail.com

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#### ABSTRACT

Lifestyle Disorders (LSD) are common problems among upper-middle and higher society children. Lifestyle has long been associated with the development of many chronic diseases. It affects both genders. WHO has recognized Noncommunicable diseases (NCDs), especially diabetes, obesity, cardiovascular disease, cancer, and chronic lung disease, have everyday lifestyle linked risk factors like lack of physical activity, unhealthy diet and feeding habits and harmful use of alcohol. Worldwide, the current scenario of NCDs is the primary cause of morbidity and mortality, even in young children. According to WHO Report 2004, these account for nearly 60% of deaths and 47% of the global burden of illness. The rise in NCDs is substantially accelerating in most developing countries like India. In India, 53% of the deaths in 2008 were due to NCDs, and cardiovascular disease (CVDs) alone accounted for 24% of deaths (WHO). In 2005 India experienced the highest loss in potentially productive years of life globally, and the leading cause of death was cardiovascular disease. The cumulative loss of national income for India due to NCDs mortality for 2006-2015 was around USD237 billion. By 2030, this productivity loss is estimated to double to 17.9 million years lost. These major NCDs are preventable through effective Ayurvedic interventions by judiciously treating lifestyle-related modifiable risk factors. This review confers the current scenario of NCDs in children and their Ayurvedic Management.

**Keywords:** Lifestyle disorder, Ayurveda, noncommunicable disease

#### INTRODUCTION

Lifestyle diseases, also known as diseases of civilization, appear to become ever more widespread as countries become more developed and industrialized<sup>1</sup>. Rapid urbanization leads to increased lifestyle risk factors, leading to lifestyle diseases. Lifestyle diseases have been causing more deaths and disabilities worldwide in recent years.<sup>2</sup> Lifestyle diseases characterize those diseases whose occurrence is primarily based on people's daily way of life and result from the poorly chosen relationship of the populace with their milieu. The main factors contributing to lifestyle diseases in children include bad food habits, physical inactivity, wrong body posture, disturbed biological clock, poor social relationships<sup>3</sup>. World Health Organization lists "lifestyle diseases" as the "number one killer" threatening humankind. Lifestyle diseases have seriously endangered human health. This is WHO's warning for mankind in the Third World Wellness Seminar. As per World Health Organization, diseases due to poor lifestyles account for the deaths of 70%-80% of citizens in developed countries, while they are 40%-50% in the less developed countries. According to WHO, 60% of related factors to individual health and quality of life are correlated to lifestyle<sup>4</sup> cardiovascular diseases (CVD) continue to be the major cause of mortality, representing about 30 per cent of all deaths worldwide. Lifestyle diseases like hypertension, diabetes mellitus, dyslipidemia and overweight/obesity are the major risk factors for the development of CVD<sup>5,6</sup>. According to a research paper published in the prestigious Lancet, there is no evidence that diet and lifestyle play a significant role in predisposition to various diseases like cancer<sup>7</sup>. Adaptation of western standard of living, characterized by fast food, television and computers, is taking its

charge on children and is producing increased numbers of overweight, passive youngsters with lifestyle disorders<sup>8,9</sup>. Increased interaction of youngsters with the internet and social media also contribute to the problem. A study revealed changes in children's and adolescents' lifestyle behaviours during the first COVID-19 lockdown. Effective strategies are needed to prevent excessive body weight gain in future COVID-19 lockdowns<sup>10</sup>.

#### Lifestyle Disease

Lifestyle diseases, also called Diseases of Civilization, are associated with our environment; by the way, we live our lives and the choices we make every day. Lifestyle diseases are different from other diseases because they are potentially preventable and can be lowered with diet, lifestyle, exercise, attitude, and relationships with the environment. The lifestyle diseases take years to develop, and once encountered, do not lend themselves easily to cure by Allopathic Medicine. Consuming junk food, addiction to screen, and less indulgence in outdoor activities are the major reasons children develop these disorders. A recent survey study in City schools has found that at least 20% of children are obese, have hypertension, and probability developing heart diseases. The rising burden of preventable risk factors for adolescent lifestyle diseases is a significant public health challenge worldwide.

Ayurveda emphasizes the importance of lifestyle in the pathogenesis of many disorders in the form of ahara vihara. The prime cause of roga is heena, mithya and atiyoga of kala, indriyartha and karma.<sup>11</sup> Ayurved has described three upastambha (supporting pillars) of life, i.e., ahara (diet), nidra

(sleep) and brahmacharya (self-control). Imbalance in any of these supporting pillars will disturb the body's homeostasis, leading to so-called lifestyle disorders. Virrudhahara, ahitahara (incompatible and unhealthy dietary practices), prajagrana (awakening at night), divaswapna (sleeping in the daytime) and suppression of thirteen natural urges invite many lifestyle disorders. There is a detailed description of a healthy diet and dietary factors in Ayurveda. It is also emphasized that even the wholesome food, taken in proper quantity, does not get adequately digested (producing intermediate metabolites in the form of Ama) if the food is taken with anxiety, Stress, fear, anger, improper dining, awakening at night etc.<sup>12</sup>

**Indian Scenario** [Source: Global status report on noncommunicable diseases 2010 WHO]

- The possibility of Indian suffering from a lifestyle disease is four per cent greater than people from other nationalities.
- India is now home to the most prominent diabetic cases globally, where 30 million are affected. This number is expected to grow to 57 million by 2025.
- Thirty-one percent of urban Indians are either overweight or obese. Obesity can triple the risk of heart disease.
- India No.1 in cardiac patients: 10% population affected. Heart Disease to be the single greatest 'killer' in India by 2015 (WHO). India suffers the highest loss from cardiovascular disease (9.2 million years lost in 2000). By 2030, this loss is expected to rise to 17.9 million years.
- Hypertension & Stress, especially from work, account for more than 50% of heart ailments. 100 million people in India have high blood pressure. Two out of three employees in India are a victim of Stress. Over 40% of urban Indians have high lipid levels (cholesterol and triglycerides) that are the significant risk factors for heart disease.

### Lifestyle Diseases in Children

These lifestyle diseases are spreading at an alarming rate and are turning into an epidemic. Children are getting things like childhood diabetes, unheard of 20 years ago. Lifestyle diseases are caused due to change in diet, improper nutrition, lack of exercise, poor sleep, excess use of computers and cell phones, mental Stress due to heavy competitive load, significant increases in the prevalence of obesity and large reductions in physical activity. When children go out and eat a lot of junk food every day, lie down and watch TV all day, these things all contribute to lifestyle diseases. All-day, children are bombarded by advertisements for the newest double chocolate chip cookie or some new pizza place opening adds to the problem. As in most families, nowadays both the parents are working, they find little time to cook. They depend heavily on ready to cook and junk food. These diets comprise high calories and have artificial colours and preservatives. So, these foodstuffs cause serious health hazards over some time. Consuming readymade foods deprives one of essential minerals and vitamins rich in traditional foods. Frequent use of junk foods with faulty dietary habits, including irregular meals, contributes to many health-related problems such as acidity, obesity, and high blood pressure.

The ever-increasing competition induces parents to pressure their children to perform well in academics and extracurricular activities. The pressure to outperform is so intense that children often find it hard to cope. Such conditions are favorable for frequent headaches, migraine, anxiety, and the child might faint when faced with severe pressure. The underlying attributable factors that cause these diseases are a complex web of social, economic, and cultural changes, which are inevitable in this era of urbanization and globalization. The urban people have a less

physically active lifestyle and more exposure to products and technologies that could be unhealthy.

Researchers of the University of Hong Kong, in a research study, observed the level of physical activity in people who died and correlated it with their risk of dying. The results are encouraging: 20% of all deaths of people 35 and older were associated with a lack of physical activity. The risk of dying from cancer increased 45% for men and 28% for women attributed to lack of physical activity. Also, the risk of dying from respiratory ailments was 92% higher for men and 75% higher for women. The risk of dying from heart disease was 52% higher for men and 28% higher for women because of a lack of physical activity.

Latest data compiled by the UT Health department Chandigarh (multicentric study PGI Chandigarh, Government Medical College and Hospital in Sector 32 and Government Multi-Specialty Hospital in Sector 16 — from January to July 20<sup>13</sup>) has found that children are increasingly falling victim to brain stroke, diabetes, hypertension, and coronary artery diseases. According to the research, 5 per cent of the patients with such lifestyle diseases are children. The data was collected:

- Brain stroke among children of the 250 cases of stroke reported in the three hospitals, around 6 per cent of the patients were children.
- Of the 3,000 cases of hypertension, a disease often linked with a stressful lifestyle, around 2 per cent were children.
- Cases of both Type I and II diabetes in hospitals were around 2,000 till July, affecting around one per cent of children.

### Major Lifestyle Diseases

The list is unending. Some of the significant lifestyle disorders are Childhood obesity, Cancer, Hypertension and Heart disease, Stroke, GI disturbances, Chronic liver disease, Chronic Obstructive Pulmonary Disease (COPD), Diabetes mellitus, Nephritis or Chronic Kidney failure, psychological disorders: stress disorders, anxiety, depression, suicidal tendency.

**Childhood obesity:** The prevalence of childhood obesity increases in developing and developed countries. The reduction in the problem of obesity is monitored nationally by using data from National Health and Nutrition Examination Survey. The report of NHANES for the year 2007-2008 estimated that 16.9% of children and adolescents in the age group of 2-19 years were obese.<sup>14</sup>

Children become overweight when the energy they 'take in' is greater than the energy they 'put out' (through physical activity and exercise). WHO defines overweight and obesity based on the following limits: Overweight: BMI is between 25 and 30 kg/m<sup>2</sup>; Obesity: BMI of 30 kg/m<sup>2</sup>.

Rapid weight gain in childhood can lead to insulin resistance and metabolic syndrome.<sup>15</sup> Shah C et al. has found some exciting information regarding youth increasing obesity in their study among school children in Bhavnagar, India. There was an association between excess weight and inactivity, as expected. There was a positive association between sleeping time and a balance between weight and height. Children of working mothers tended to become underweight<sup>16</sup>.

As per Acharya Charaka, the causes of obesity are sedentary lifestyle, daytime sleep, meals having excess carbohydrates and fats, carefree life and hereditary.<sup>17</sup>

### Possible problems for overweight children

Overweight children can face many difficulties. They may feel under confidence. They can also be subjected to bullying from other children. This may make hesitant these children in taking part in everyday activities such as school sports. Unfortunately, this cycle can make weight control more difficult. Research shows that overweight children are more likely to become overweight adults. Children who continue to be heavy into adulthood are at greater risk of developing; high blood fats and heart disease, type 2 diabetes, high blood pressure, stroke, joint problems, breathing problems, some forms of cancer, gallstones etc.

**Diabetes mellitus:** Childhood diabetes, which was unheard of 20 years ago, now accounts for 1% of all diabetic patients.

**Cancer:** A recent research paper published in the esteemed Lancet precisely articulated the International variation in cancer incidences and the existence of lifestyle diseases.

In many developed countries, peoples' food changed markedly in the twenty-first century, usually with increased consumption of dairy products, meat, vegetable fats and alcoholic beverages. Also, there is a substantial decrease in starchy staple foods like whole bread, potatoes, maize flour and rice. Other aspects also changed, particularly reduction in physical activity leading to a higher prevalence of obesity. It is also illustrious that high rates of cancers were detected in that period. On the other hand, individuals in developing countries habitually had diets based on one or two starchy staple foods, with fewer intakes of animal fats and sugar, and had low rates of cancers. The proposition is supported by studies showing that people who migrate from one country to another usually acquire the cancer rates of the host country, suggesting that environmental or lifestyle factors are the main determinants of the international variation in cancer rates rather than genetic factors.<sup>20</sup>

**GI disturbances** - IBS, hyperacidity, chronic diarrhea etc. As per Acharya Charaka, the causative factors for Udara roga and grahni (GI disturbances) are, skipping the meal, eating before the digestion of the last meal, excess eating, taking virrudhahara (incompatible combinations, garavisha (harmful adulterants), asatmya ahara (incompatible or allergic food), heavy, chilled, very hot, dry, stale food, eating while suppressing natural urges, avoiding rules of eating, dincharya (daily routine) and ritucharya (seasonal routine). These factors, by vitiating agni giving rise to severe GI trouble.<sup>21,22</sup> These causative factors are the common parts of today's lifestyle.

The chronic **liver disease presents** as jaundice, loss of appetite, liver enlargement, fluid accumulation, impaired consciousness.

**Chronic Obstructive Pulmonary Disease (COPD):** Breathing becomes difficult while exercising. This can sometimes be long-term and may result from chronic bronchitis, emphysema, asthma, or chronic bronchiolitis. Cigarette smoking (active/passive) and air pollution make it worse.

**Computer vision syndrome (CVS)** is a temporary condition resulting from focusing the eyes on a computer display for protracted, uninterrupted periods of time. Some symptoms of CVS include headaches, blurred vision, neck pain, fatigue, eye strain, dry, irritated eyes, double vision, polyopia, and difficulty refocusing the eyes. These symptoms can be further aggravated by improper lighting conditions (i.e., bright overhead lighting or glare) or air moving past the eyes (e.g., overhead vents, direct air from a fan). CVS is caused by decreased blinking reflex while

focusing on computer screens for long hours. Dry eye is a significant symptom targeted in the therapy of CVS.

### Prevention of Lifestyle Disorders

It realizes the severe economic and health-related impact of noncommunicable lifestyle diseases. The WHO initiated a global response in the year 2000 through a global strategy, an action plan for 2008-2013 for the prevention and control of lifestyle diseases and also to evolve intervention for modifiable risk factors. It is estimated that approximately 80% of heart disease, stroke, type 2 diabetes and 40% of cancers can be prevented through inexpensive and cost-effective interventions that address the primary risk factors [WHO/World Economic Forum Report of a Joint Event].

An active lifestyle can help manage the plethora of diseases. Childhood is a significant opportunity to develop healthy patterns for life and prevent weight problems. It can be a challenge for the parents and requires patience, positivism, practice, and time.

Ayurveda offers more proactive approaches to preventing lifestyle diseases through holistic, healthy living medicine. By following the rules of dining, dincharya, ritucharya and swasthvratas and by avoiding virrudhahara, ahitahara (unhealthy and incompatible dietary practices), adhayasana (eating before the digestion of previous meal), prajagrah (awakening in the night), divaswapna (sleeping in the daytime) and suppression of thirteen natural urges many of the lifestyle diseases can be well prevented

### Dinacharya (Daily Routine)

Ayurveda has got the unique concept of Daily routine, known as Dinacharya. These activities are waking up, sleeping, and sitting and covering all that we do in the whole day. All social activities are included in Dinacharya. Everyone in our world is set for a particular pattern and system. Vata, Pitta and Kapha are the doshas, which decides our activities and regularize these. These three works on a specific pattern of time, which makes the circadian system the biological clock. A person's daily routine should be such that it will help maintain the balance of the Doshas of an individual without disturbing their natural functioning. One can adjust all according to circumstances but should take care of Doshas' balance.

- Wake up in time. But if the food taken last night at dinner has been appropriately digested with discomfort in the abdomen, one should sleep for some more time.
- Drink a good amount of water. It will help the body to wash out all the stored toxins.
- Go for a walk or light exercise.
- Go for defecation when there is an urge. Don't suppress or pressurize.
- Proper cleaning of Teeth, tongue and mouth and body.
- Pray to God, thanking Him for this beautiful world he has given to us to live. Promise yourself that you will do something creative to better the world.
- Eat-in time. Try to plan your diet according to your Doshas and your Prakruti.
- Read healthy literature, for this is food for the brain.
- Go to bed in time. Don't sleep in the daytime. According to Ayurveda, it causes over 46 diseases, like - obesity, diabetes, arthritis, heart diseases, and many more.

### Ritucharya (Seasonal Routine)

Seasons are six in number; tastes are six and Doshas are three. This is a digitalized relation between all these. To maintain health and remain in harmony with nature and our Doshas, one should follow certain regimes and avoid certain things in diet and lifestyle, enumerated as Ritucharya.

### Natural Urges

There are 13 natural urges described in Ayurveda: Flatus, Urination, Defecation, Seminal discharge, Vomiting, Sneezing, Belching, Yawning, Appetite, Thirst, Tears, Sleep, breathing after exercise (Air- Hunger). All these urges are meant for eliminating the waste or irritating materials from the body. So, one should not suppress the natural urges, willingly or unwillingly. One might be inviting heart diseases by stifling a single yawn or retaining tears. One can have asthenia of one's sense organs by stopping a single sneeze. A bout of cough may cause many diseases! The speed of a coughing bout or a sneeze is 102 miles per hour. When stopping a thing running at a higher rate, it will hurt. One should cover one's mouth while sneezing, coughing and yawning, but should not stop these to look civilized.

### Measures to Develop a Healthy Lifestyle for Children

- Good nutrition starts early in life. Breastfeeding exclusively for up to six months.
- Encourage a wide variety of nutritious foods. Offer cereals, grains, fresh vegetables, and fruits.
- Discourage snacking on sweets and fatty foods. Provide snacks that are high in nutrients about calories.
- Set a good example for your child to copy. Children develop tastes at an early age.
- Establish a regular family meal pattern. Share mealtimes and eat the same healthy foods. . Eat without distractions. Turn off the television during mealtime.
- Try to make mealtimes pleasant with conversation and sharing. Avoid fussing, nagging, arguing or complaining at the table. Mealtime stress can lead to emotional overeating.
- Encourage children to choose water as a beverage and avoid sweetened and carbonated beverages
- Try not to punish, reward, or cheer your child up with food. It establishes an unhealthy relationship with food

### Fun family activity

- Be active together. Let your child see you being involved too.
- Encourage lots of free playtimes outside, fun activities and individual sports like swimming and dancing. Walk or cycle to the shops or school.
- Be supportive and encouraging. Some children feel embarrassed and uncomfortable about their physical skills or appearance.
- Limit sitting activities like TV watching, playing video games, and using computers. These activities should total no more than two hours a day for children.

### Helping the overweight child

If the child is overweight, it is essential to take the advice of a health professional. Children should not be on diets. It is advised to make crucial changes to the family's lifestyle and eating habits. Everyone in the family should be involved in these changes, unrelatedly of body weight, so the child should not feel singled out. Children who are overweight and obese need to know that they are loved and important, irrespective of their weight.

### Measures to Reduce the Risk of Computer Vision Syndrome in Children

1. The use of artificial-tear solutions can reduce the effects of dry eye in CVS
2. Limiting the amount of time, a child spends at the computer without a break. Encourage kids to take 20-second intervals from the computer every 20 minutes.
3. Maintaining the proper lighting. A routinely recommended approach is to blink the eyes now and then consciously.

### Lifestyle Medicine

Lifestyle Medicine is nothing but lifestyle interventions in treating and managing lifestyle diseases. Such interventions include diet rectifications (good nutrition), yoga<sup>23</sup>, stress management, smoking cessation (active/passive), and a variety of other non-drug modalities. A growing body of scientific evidence has demonstrated that lifestyle intervention is an essential component in treating chronic disease that can be effective when used appropriately with medication. Ayurveda has got the treasure of many wonder drugs for these lifestyle disorders.

### Anti-Diabetic Diet

- Bitter Gourd (*Momordica charantia*)<sup>24</sup>
- *Trigonella foenum-gracecum*, *Costus speciosus*, *Plantago ovata*, *Allium sativum*, *Hemidesmus indicus*, *Allium cepa*<sup>25</sup>
- *Panax ginseng*, *Dioscorea dumetorum*, *Cuminum nigrum*, *Ocimum sanctum*, *Curcuma longa*, *Phyllanthus emblica*<sup>26</sup>
- *Swertia chirayita*.<sup>27</sup>
- *Mangifera indica* L (Mango)<sup>28</sup>
- Jambul (*Syzygium cumini*) Fenugreek (*Trigonella foenum-gracecum*), Gudmar (*Gymnema sylvestre*).<sup>29</sup>

### Anti-hypertensive

- *Rauwolfia serpentina*,<sup>30</sup>
- *Nigella sativa* (Kalonji)<sup>31</sup>

### Anti-obesity<sup>32</sup>

- Use of guduchi, devadaru, musta, triphala, takrarishta and honey is recommended.
- Powder of yava and amalaka is an excellent formulation for the same.
- Shilajita, along with the juice of Agnimatha, works well.
- Honey water early in the morning.
- Powder of Vidanga, Sunthi, Yavakshara, Yava, Amalaki and 'Loha (iron) Bhasma'.
- Triphala Guggulu, Chandraprabha vati, Arogya Vardhini, Nawaka Guggulu,

### Antioxidants and Immunomodulators

- **Guduchi** -The active principles of *T.cordifolia* were found to possess antioxidant and immunomodulatory activities.<sup>33,34,35</sup>
- **Tulsi**- *Ocimum sanctum*.<sup>36</sup>
- **Ashwagandha**. Myelosuppression mice treated with an extract of *Ashwagandha* displayed a significant increase in Hb conc., RBC, WBC, platelet count and body weight.<sup>37</sup> Root possesses free-radical scavenging activity.<sup>38,39</sup>
- **Amlaki** (*Emblica officinalis*) is stated as one of the highest naturally occurring sources of vitamin C.<sup>40</sup> The antioxidant effect of *Amalaki* is significantly greater than that of vitamin C alone.<sup>41</sup> *P. emblica* has been found to enhance natural killer cell activity and antibody-dependent cytotoxicity in tumour-bearing mice, improving life span to 35% beyond the control animal.<sup>42</sup>

- **Haritaki**- Aq. extract of *Terminalia chebula* found to protect cellular organelles from radiation-induced damage; it may be considered as a probable radio protector.<sup>43</sup>
- **Yashtimadhu**- Intraperitoneal treatment was found to enhance total WBC count. Maximum total WBC count was increased to 114.9-18%. The results indicate the immunomodulatory activity of Glycyrrhizic acid.<sup>44,45</sup>

#### Adaptogen and Anxiolytic and Antidepressant

- **Guduchi**- A clinical study advocated that *Tinospora cordifolia* and yoga practice have substantial anti-stress activities, which is shown by its alleviating effects on chronic Stress-induced psychological and biochemical perturbation similar to that caused by the recognized adaptogenic agent diazepam.<sup>46</sup> Recent data suggest that *T.cordifolia* may induce adaptation.<sup>47</sup>
- **Tulsi**- *Ocimum* extract can help in improving Stress-induced learning impairments.<sup>48</sup>(Rodrigues, V et al., 1999). Pretreatment of rats with *O.sanctum* extract before exposure to noise stress prevented the leucopenia and changes in differential count of pillars leucocyte.<sup>49</sup>
- **Ashwagandha**- Rats treated with an extract of *Withania somnifera* showed better stress tolerance in cold-water swimming test.<sup>50</sup>
- **Haritaki**- The plant possesses promising anti-stress and endurance promoting activity.<sup>51</sup>
- **Ashwagandha**- WSG (glycowithanolides isolated from WS roots) was found to induce an anxiolytic effect, comparable to that produced by lorazepam and antidepressant effect, comparable with that caused by imipramine. The investigations support the use of WS as a mood stabilizer in clinical conditions of anxiety and depression in Ayurveda.<sup>52</sup>
- **Pippali**- In an experimental study, the results suggest that piperine possesses potent antidepressant.<sup>53</sup>

#### CONCLUSION

It is easy to pluck a plant when it is still a sapling, but it is difficult to become a tree. So, if attention is paid towards the lifestyle, several diseases can be prevented successfully. Lifestyle diseases can prove troublesome for children to handle at a young age. Ayurveda is the foremost life science and describes ways to prevent and manage lifestyle disorders. Ayurveda can provide a better solution in the forms of better dietary management and lifestyle based on ayurvedic principles, Panchakarma procedures for bio-purification, medicaments, and rejuvenation therapies in the form of Rasayanas. The holistic intervention targeted approach of Ayurveda toward complete physical, psychological, social, and spiritual well-being makes this science a brilliant option for lifestyle disorders. Awareness about the role of these factors on human health among the community at some level, especially by adding it as a part of the syllabus in life science, can make the individual skilled enough to live a healthy lifestyle and prevent many future health problems beforehand. NCDs constitute a significant threat to the health of the people of India and a considerable challenge for the overall development of the country by affecting the younger population in their active, productive life. It is also creating an enormous financial burden due to prolonged health care costs. As the significant NCDs in children are the result of everyday shared lifestyle-related modifiable risk factors like lack of physical inactivity, unhealthy diet, excessive use of mobiles and computers, so for the prevention and control of NCDs, more focus should be given on the interventional programs and activities directed for reducing modifiable lifestyle risk factors. The national policies need to be strengthened for promoting partnership with civil society, NGOs, the private sector and professional bodies.

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