

**PACKAGED/JUNK FOOD AND CHILD HEALTH: AN INTEGRATIVE REVIEW
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ABSTRACT

The consumption of packaged and junk foods among children has increased remarkably over the last two decades due to urbanization, lifestyle modifications, media influence, and changing dietary behaviours. These foods are generally rich in refined sugars, unhealthy fats, sodium, preservatives, artificial flavouring agents, and additives while being deficient in essential nutrients. Excessive intake of junk food is strongly associated with obesity, gastrointestinal disorders, micronutrient deficiencies, behavioural problems, metabolic syndrome, and impaired cognitive development in children. Modern scientific evidence demonstrates that ultra-processed foods adversely affect physical and psychological health, whereas Ayurveda describes such foods under the concepts of Viruddha Ahara (incompatible food), Abhishyandi Ahara (channel-clogging diet), and Agnidushti (digestive impairment). This review article discusses the composition of packaged foods, patterns of consumption, health consequences, behavioural effects, and preventive strategies according to both modern medicine and Ayurveda.

KEYWORDS: Junk food, packaged food, child health, obesity, Ayurveda, ultra-processed food, Paediatrics.**INTRODUCTION**

Childhood is a critical period of physical growth, cognitive development, immune maturation, and behavioural conditioning. Proper nutrition during this stage is essential for achieving optimal health and preventing future diseases. In recent decades, dietary patterns among children have undergone a substantial transformation due to rapid urbanization, industrialization, globalization of food markets, and changing family lifestyles. Traditional home-cooked meals are increasingly being replaced by packaged, processed, and fast foods because of convenience, aggressive marketing strategies, and easy availability.^[1-3]

Packaged and junk foods generally refer to commercially processed food products that are rich in calories, refined carbohydrates, unhealthy fats, sodium, preservatives, artificial flavouring agents, and synthetic additives while lacking essential nutrients such as dietary fibre, vitamins, minerals, and antioxidants. Common examples include

chips, soft drinks, chocolates, candies, instant noodles, burgers, pizzas, bakery products, processed meats, and ready-to-eat frozen foods.^[4,5]

The rising consumption of these ultra-processed foods among children has become a major global public health concern. According to the World Health Organization (WHO), unhealthy dietary habits and excessive intake of energy-dense processed foods are among the leading contributors to childhood obesity and non-communicable diseases.^[6,7] Modern scientific studies indicate that excessive junk food consumption adversely affects almost every system of the body, leading to obesity, metabolic syndrome, insulin resistance, hypertension, dyslipidaemia, gastrointestinal disturbances, dental caries, micronutrient deficiencies, behavioural disorders, and impaired cognitive performance.^[8-10]

From an Ayurvedic perspective, food (Ahara) is considered one of the three fundamental pillars of life

(Trayopastambha), along with sleep and regulated lifestyle. Ayurveda emphasizes that wholesome and balanced food sustains proper growth, immunity, mental health, and longevity. Conversely, improper dietary habits disturb Agni (digestive fire), generate Ama (metabolic toxins), and impair tissue nourishment (Dhatu Poshana).^[15-17]

Packaged and junk foods can be correlated in Ayurveda with concepts such as Viruddha Ahara (incompatible diet), Abhishyandi Ahara (channel-clogging foods), Guru and Ati Snigdha Ahara (heavy and excessively oily foods), and Agnidushti (digestive impairment).^{15,16}

CLASSIFICATION OF PACKAGED/JUNK FOODS

Sugar-Rich Foods	Fat-Rich Foods	Highly Processed Foods	Preserved and Artificially Coloured Foods
Soft drinks Candies Chocolates Packaged juices	Fried chips Burgers Pizza French fries	Instant noodles Frozen snacks Processed meats	Packaged sweets Bakery products Flavoured beverages

NUTRITIONAL CONCERNS ASSOCIATED WITH JUNK FOOD

Ultra-processed and packaged foods are nutritionally imbalanced products characterized by high caloric density and poor nutrient quality. These foods are specifically engineered to be highly palatable, inexpensive, and convenient, which encourages excessive consumption among children.^[1,2] Modern nutritional science identifies junk foods as major contributors to both overnutrition and hidden malnutrition.

Many children consuming junk food suffer from “hidden hunger,” a condition where calorie intake is adequate or excessive but micronutrient intake remains insufficient. Iron deficiency anaemia, calcium deficiency, zinc deficiency, and vitamin D deficiency are increasingly prevalent among children consuming ultra-processed foods.^[14,22] These deficiencies impair growth, bone development, immunity, cognitive function, and physical performance.

Artificial food additives represent another important nutritional concern. Modern packaged foods often contain artificial colours, synthetic flavour enhancers, preservatives, emulsifiers, and sweeteners. Some studies suggest that these additives may influence hyperactivity, allergic responses, behavioural disturbances, and gut microbiota imbalance in susceptible children.^[13,23]

From an Ayurvedic viewpoint, such foods are considered nutritionally and energetically unsuitable because they lack freshness (Prana), natural qualities, and digestibility. Foods that are stale, excessively processed, preserved, reheated, chemically treated, or incompatible disturb Agni and generate Ama.^[15-17]

Regular intake of such foods leads to Kapha aggravation, Ama accumulation, Meda Vriddhi (increase in adipose tissue), impaired immunity, and metabolic disorders.

Considering the increasing burden of childhood obesity and lifestyle disorders, there is an urgent need to understand the harmful effects of packaged foods through both modern scientific evidence and Ayurvedic principles. Integrating Ayurvedic dietary wisdom with contemporary nutritional science may provide a holistic and sustainable approach toward improving child health and preventing chronic diseases.^[18,19]

Ayurvedic texts further classify excessively oily, heavy, preserved, and channel-clogging foods as Abhishyandi Ahara, Guru Ahara, and Viruddha Ahara.^[15] Such dietary practices ultimately result in Kapha aggravation, Meda Dhatu accumulation, sluggish metabolism, poor immunity, and lifestyle disorders.

EFFECTS OF PACKAGED FOOD ON CHILD HEALTH

1. Obesity and Overweight

One of the major consequences of junk food consumption is childhood obesity¹⁹. Increased intake of sugar-sweetened beverages and calorie-dense snacks contributes to excessive weight gain.

Mechanisms include

- * Increased caloric intake
- * Sedentary behavior
- * Altered satiety mechanisms

Obesity in childhood increases the future risk of:

- * Type 2 diabetes
- * Hypertension
- * Cardiovascular diseases^[7,12]

2. Gastrointestinal Disorders

Packaged foods are low in dietary fibre and disturb gut health.

Common gastrointestinal problems include:

- * Constipation
- * Indigestion
- * Bloating
- * Recurrent abdominal pain.^[8]

Artificial additives and preservatives may alter gut microbiota and digestion.

According to Ayurveda, these foods weaken digestive power (Agnimandya) and promote Ama formation,^[16]

3. Behavioural and Psychological Effects

Several studies suggest that excessive junk food consumption may affect:

- * Attention span
- * Mood regulation
- * Sleep quality
- * Learning behaviour.^[10]

High sugar intake causes rapid fluctuations in blood glucose levels, leading to irritability and hyperactivity.

Ultra-processed foods also stimulate reward pathways in the brain similar to addictive substances.^[10]

4. Micronutrient Deficiencies

Despite excessive caloric intake, many children consuming junk foods suffer from hidden hunger or micronutrient deficiencies.

Common deficiencies include	These deficiencies impair
* Iron deficiency anemia	* Growth
* Vitamin D deficiency	* Immunity
* Calcium deficiency	* Bone health
* Zinc deficiency ^[14]	* Cognitive development

5. Dental Problems

Frequent consumption of sugary foods and beverages promotes:

- * Dental caries
- * Tooth enamel erosion
- * Gum diseases

Sticky processed foods prolong sugar exposure in the oral cavity.

6. Cardiometabolic Consequences

Long-term junk food consumption contributes to:

- * Dyslipidaemia
- * Insulin resistance
- * Metabolic syndrome
- * Fatty liver disease^[11,12]

Processed foods rich in sodium also increase the risk of hypertension.

7. Impaired Immunity

Children consuming nutritionally poor foods often exhibit weakened immunity because of deficiencies in vitamins, minerals, antioxidants, and essential fatty acids. This may result in frequent infections, delayed recovery from illness, poor wound healing, and reduced disease resistance. Ayurveda emphasizes that balanced nutrition is essential for maintaining Ojas, the essence responsible for immunity and vitality.^[15-17]

8. Cognitive and Academic Impact

Nutrition plays an essential role in brain development and learning capacity. Excessive junk food intake negatively affects memory, attention span, problem-solving ability, and school performance.^[11,24] Deficiencies of iron, zinc, omega-3 fatty acids, and vitamins are particularly associated with impaired cognitive development.

ROLE OF MEDIA AND ADVERTISING

Media and advertising play a major role in shaping children's dietary preferences, food choices, and eating behaviours. In the modern digital era, children are continuously exposed to aggressive marketing strategies promoting packaged foods, sugary beverages, fast foods,

and ultra-processed snacks.^[21] Television, social media platforms, mobile applications, online gaming, celebrity endorsements, and attractive product packaging significantly influence children's food consumption patterns.

Food industries specifically target children because they are highly impressionable and easily attracted by colourful advertisements, cartoon characters, promotional toys, catchy slogans, and emotionally appealing campaigns. Advertisements often portray junk foods as enjoyable, fashionable, and socially desirable while rarely highlighting their harmful health effects.^[20,21]

Television advertising remains one of the strongest influences on children's eating habits. Studies have demonstrated that repeated exposure to food advertisements increases cravings for high-calorie foods and encourages unhealthy snacking behavior. Children frequently demand advertised foods from parents, contributing to increased household purchase and consumption of processed products.^[21]

Digital media has further intensified this problem. Social media influencers, online videos, gaming applications, and targeted internet advertisements continuously expose children and adolescents to unhealthy food promotion. Food companies strategically use digital algorithms and personalized marketing techniques to increase engagement and consumption.^[12,21]

Common marketing strategies include celebrity endorsements, cartoon mascots, free gifts and promotional offers, bright and attractive packaging, emotional and entertainment-based advertising, and digital influencer marketing. These methods significantly affect the food preferences and dietary habits of children.

From a public health perspective, unrestricted advertising of unhealthy foods contributes to rising rates of childhood obesity and lifestyle disorders. Several countries have therefore implemented policies restricting

junk food advertisements directed toward children.^[6,22] School-based awareness programs and parental monitoring are essential to counter the harmful influence of food marketing.

LIFESTYLE FACTORS ASSOCIATED WITH JUNK FOOD CONSUMPTION

Factors contributing to unhealthy dietary behavior include

- * Increased screen time^[9]
- * Reduced outdoor activities
- * Busy parental schedules
- * Urban lifestyle
- * Easy availability of fast foods

Sedentary behavior further worsens obesity risk.

AYURVEDIC PERSPECTIVE

Ayurveda considers Ahara (diet) as one of the fundamental pillars of life (Trayopastambha) and regards proper nutrition as essential for maintaining health, promoting growth, and preventing diseases. Childhood (Bala Avastha) is a period of rapid physical, mental, and immunological development, where appropriate nutrition plays a central role. Classical Ayurvedic literature emphasizes that food is not merely a source of nourishment but also determines the quality of tissues (Dhatus), strength (Bala), complexion (Varna), immunity (Vyadhikshamatva), and mental development.^[15-17]

The importance of diet has been emphasized in classical texts:

“Ahara Sambhavam Vastu, Rogashcha Ahara Sambhava”
(Charaka Samhita)^[15]

Meaning: The body originates from food, and diseases also arise due to improper food intake.

Children possess comparatively immature digestive capacity (Manda Agni) with natural predominance of Kapha Dosha, which supports growth and tissue development. Due to this physiological state, children require fresh, wholesome, light, and easily digestible food. However, changing dietary patterns and increased availability of processed and fast foods have led to a major shift from traditional dietary practices toward highly processed food consumption.^[1,2,13,21]

From an Ayurvedic perspective, packaged and fast foods exhibit properties like:

- Guru (heavy to digest)
- Ruksha (dry)
- Abhishyandi (causing obstruction in body channels)
- Ati-Lavana (excessively salty)
- Ati-Madhura (excessively sweet)
- Vidahi (causing burning and metabolic disturbances)
- Viruddha Ahara (incompatible food combinations)^[15-17]

Frequent intake of such foods may disturb digestive and metabolic functions.^[14,15]

According to Ayurveda, proper digestion depends upon the balanced functioning of Agni (digestive fire). Consumption of processed and fast foods weakens Jatharagni, leading to Agnimandya (reduced digestive capacity). Impaired digestion subsequently causes formation of Ama (toxic undigested metabolic products), which is considered the primary cause of many diseases.^[15-17]

The pathological sequence can be represented as

Improper food intake (Mithya Ahara Sevana) → Agnimandya → Ama Utpatti → Dosha Dushti → Srotorodha → Disease manifestation.^[15-17]

From the perspective of pediatric health, these dietary alterations may adversely affect various physiological systems. Digestive disturbances such as Ajirna (indigestion), Aruchi (loss of appetite), Adhmana (abdominal distension), and constipation are commonly observed consequences. Improper nourishment of tissues (Dhatu Poshana) may lead to growth disturbances and weakened immunity.^[4,5,15,16]

Ayurveda also emphasizes the influence of diet on mental health through the concept of Satvika, Rajasika, and Tamasika dietary qualities. Frequent consumption of processed foods with excessive additives may contribute to Rajasika and Tamasika predominance, manifesting as:

- Hyperactivity
- Irritability
- Poor concentration
- Sleep disturbances
- Behavioural alterations^[10,15,17]

This concept correlates with modern observations regarding attention difficulties and behavioural changes associated with unhealthy dietary habits in children.^[10,20]

AYURVEDIC MANAGEMENT

Management of the adverse effects of packaged and fast foods focuses primarily on correcting digestion, eliminating Ama, balancing Doshas, and promoting healthy dietary behavior.^[15-17]

1. Ahara Chikitsa (Dietary Management)

Dietary correction forms the cornerstone of treatment.^[15,17]

Recommended foods include

- Freshly prepared home-cooked meals
- Seasonal fruits
- Green vegetables
- Whole grains
- Milk and milk products according to suitability
- Traditional nutritious preparations
- Adequate fluid intake^[4,5,17]

Foods to avoid

- Carbonated beverages
- Deep-fried foods

- Packaged snacks
- Artificially flavoured foods
- Excess refined sugar products^[1–3,7,14]

Ayurveda states

“Pathye Sati Gadaartasya Kim Aushadha Nishevane”^[17]

Meaning: When proper diet is followed, medicines become less necessary.

2. Dinacharya (Lifestyle Modification)

Healthy daily routines should be encouraged:

- Fixed meal timings
- Adequate sleep
- Outdoor activities
- Physical exercise
- Limitation of screen exposure^[9,17]

Lifestyle correction helps improve digestion, metabolism, and physical activity levels while reducing obesity risk and sedentary behavior.^[8,9,18]

3. Rasayana Therapy

Rasayana measures may improve immunity and growth by enhancing Vyadhikshamatva and tissue nourishment.^[15,17]

Several Rasayana drugs described in Ayurveda possess antioxidant, immunomodulatory, and rejuvenating properties that may help counter nutritional deficiencies and metabolic disturbances associated with junk food consumption.^[15–17]

PREVENTIVE STRATEGIES

1. Dietary Education

- Encourage home-cooked meals
- Teach healthy eating habits^[4,18]

2. Parental Awareness

Parents should

- Read food labels
- Limit sugary snacks
- Avoid reward-based junk food habits^[3,7,22]

3. School-Based Interventions

- Healthy canteen policies
- Nutrition education programs^[22]

4. Lifestyle Modification

- Reduce screen time
- Encourage outdoor physical activity^[9,18]

5. Policy Measures

- Restrict junk food advertisements targeting children
- Tax sugar-sweetened beverages
- Promote healthy school meals^[22]

DISCUSSION

The increasing consumption of packaged food among children represents a major public health concern. Evidence from multiple studies demonstrates a strong

association between ultra-processed foods and adverse physical, metabolic, and behavioural outcomes.^[11,12,20]

Children are particularly vulnerable because dietary habits formed during childhood often persist into adulthood. Preventive strategies should therefore focus on:

- Early nutritional counselling
- Family-based interventions
- School awareness programs^[18–22]

Integration of Ayurvedic dietary principles with modern nutritional science may provide a holistic approach toward improving child health.^[15–17]

CONCLUSION

Packaged and junk foods have significant adverse effects on child health, including obesity, gastrointestinal disorders, behavioural disturbances, micronutrient deficiencies, and metabolic complications.^[1,7,8,11,12] Increasing awareness among parents, schools, healthcare professionals, and policymakers is essential to reduce unhealthy dietary practices among children. Promotion of balanced home-cooked diets and healthy lifestyle habits is crucial for the prevention of long-term health consequences.^[15–22]

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