

Fast Food Addiction: A Major Public Health Issue

Review Article

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Abstract

Fast food/Junk food is designed to be tasty, comforting and convenient. Unfortunately, whilst these foods contain lots of calories, they often have far lower levels of fiber, water and minerals as compared to natural foods. Packaged food and snacks are also created specifically so that we get enough texture and taste from each bite to tantalize our taste buds; but not enough to make us feel full. It's evident that fast food feels good to eat and tempts us in many different situations. Fast food first popularized in the 1970s in the United States, which has today the largest fast food industry in the world. As taste, time considerations, convenience, and cost are major factors that contribute to an adolescent's or young adult's food choices, fast food restaurants serve as popular sites for their meals eaten outside the home. Current approaches suggest that fast food restaurants should be required to clarify nutrition information such as energy and fat content on their menu boards and on product packaging. This is important to help the consumer to make better food choices before purchasing. An adequate, nutritious, and balanced diet is essential to maintain health for one's lifetime. To achieve this healthy diet, fast food consumption should be limited.

Keywords: Morbidity and overweight; Obesity among children; Junk food; Stroke and heart diseases; Food induced neuro-degeneration; Carbonated beverages; Red meat over-consumption; Food effects in fertility and sex drive; Artificial sweeteners and condensed milk

Introduction

Menus, as lists of prepared foods, provides origin of the food items (Thai, Chinese, Continental), restaurant's mission, chef's philosophy of cooking, brief idea about food processing, special combo offers along with their cost. The colorful menu or flyers attracts fast food lovers to spend more and more in their favorite restaurants for both its decadent yumminess and its ultra-convenience. High income, rapid urbanization, free home deliveries, mouthwatering advertisements and international cuisines have contributed to a rising trend in increased junk food intake. Calculation of monetary cost gets more priorities than the actual hidden health costs, as usual. The growing widespread use of fast food among adolescents and young adults is of concern due to the high fat and energy intake, which may cause obesity and subsequently obesity-related chronic diseases. The added fat, sugar, and salt create a taste that makes people crave these foods, a sensation that many describe as an addiction. Increase in the junk food consumption is a global phenomenon having a prevalence of around 70% [1]. US fast-food sales increased exponentially between 1970 and 2000, from \$6 billion to \$110 billion [2]. During this time, obesity rates among US adults doubled and it is expected that 85% of US citizens will be affected by obesity by 2030 [3]. The real-life cost of fast foods in terms of obesity, diabetes and cardiac complications are well

documented, repeated several times in newspapers, health bulletins, journals and so on. New York city became the first jurisdiction in the US to require restaurant chains to post calorie information on menus and menu boards [4]. However, the dark side of the fast food consumption is not ended yet, some more are there to look forward.

Obesity

Most of the fast food contains a large amount of sugar, fats and carbs and less minerals and vitamins. This means that people are taking in large amounts of unhealthy calories in the shape of fast food which leads to weight gain and ultimately obesity. In a Brazilian study, several products were identified as obesogenic: sweets and sugar, typical rich food dishes, pastries, fast food, oils, milk, cereals, cakes and sauces [5]. Obesity is linked to several long-term health conditions, premature death and illness including diabetes, heart disease, stroke, gall bladder disease, fatty liver, arthritis and joint disorders and some cancers [6]. In a newspaper interview, Professor AK Azad Khan, President, Diabetic Association of Bangladesh said 40% school going children of Dhaka city were either obese or overweight [7]. A community level cross-sectional study in Bangladesh, Hossain et al. 2019 reported that nearly 65% of the mothers of preschool aged children were not aware of childhood obesity as a health problem [8].

Fast food consumption habit has been found as a potential risk factor for overweight and/or obesity among children in other studies [9,10]. Also, Al Muktadir et al. 2019 reported that (systematic random sampling attending in 27 established public and private universities) more than 40% of the youth went to fast food restaurants at least once per week and over 27% went regularly (2 times/week). Youth having fast foods 2 times/week, consuming soft drinks 3-4 times/week were more likely to be obese [11]. Processed and fast foods contain high amounts of saturated fats. Fast foods reduce the quality of diet and provide unhealthy choices especially among children and adolescents raising their risk of obesity.

Diabetes

Junk food includes many types of fast food, processed foods, and premade snack foods. Fast food is often highly processed, and this can have a negative impact on health. Fast food consumption and out-of-home eating behavior is a main risk factor for lower diet quality, higher calorie and fat intake and lower micronutrients density of diet [12]. The fast food market is mostly unregulated in Bangladesh with no government policy to control pricing and advertisements giving the way of new global chains in the market. Consumption of fast foods ≥ 2 times/week increased the risk of insulin resistance and T2DM. Frequent consumption of fast foods was accompanied with overweight and abdominal fat gain, impaired insulin and glucose homeostasis, lipid and lipoprotein disorders, induction of systemic inflammation and oxidative stress [13]. Fast food restaurants were found to be positively associated with diabetes prevalence in all counties except high poverty/medium-minority [14]. Research has shown that excess calories shorten lifespan, whereas moderate caloric restriction slows the aging process and protects the body and brain [15]. Overweight and obesity are major risk factors for type 2 diabetes. Again, nitrosamines of processed meats, mostly used in fast foods, have been demonstrated to be toxic to beta cells and subsequently to increase the risk of T2D in animal studies [16]. Higher pre-pregnancy consumption of fast foods was associated with an increased risk of diabetes in pregnancy and high birth weight in first-time mothers, found in a southwest Sydney-based study [17].

Stroke

Stroke, previously thought a condition belonging to the elderly, is now increasingly a middle-aged health problem too. Healthy lifestyle choices reduce the risk of stroke by ~80%, according to Spence, 2019. Also, each 5 kg/m² increase in BMI, within the range of 25-50 kg/m² is associated with about 40% higher stroke mortality [18]. Higher consumption of fast food was associated with higher BMI Z score [13]. Frequent consumption of fast food, ≥ 2 times/week, compared to <1 time/week, has been accompanied with ≥ 4.5 kg weight gain during a fifteen-year follow-up of US adolescents and young adults, says the same study. Fuhrman, 2018 stated that eating unhealthier fast and processed foods 7-fold increase the risk of early-life stroke [15]. Vaitkeviciūtė et al. 2019 also pointed associations between the frequencies of consumption of unhealthy, high-fat food, soft drinks and higher BMI in children [19]. Wall et al. 2018 found an inverse association between BMI and higher consumption of fruit, vegetables, pulses and nuts in adolescents [20]. There was a significant association between fast food restaurants and stroke risk in neighborhoods in a

community-based study. Accessibility to fast food restaurants may be one pathway by which neighborhood disadvantage contributes to atherosclerosis [21]. Interestingly, living farther away from a fast food restaurant was found to be associated with lower BMI for children, as reported by Huang et al. 2019 [22]. Caffeinated energy drinks have also been associated with seizures and stroke [23].

Heart Diseases

The prevalence of fast food consumption, obesity and hypertension is high among children in major cities in China, according to Zhao et al. 2017. 16-20% of Chinese children have high BP [24]. Association between increased BMI and hypertension in children with fast food is also detailed in another study done in Sikkim, India [25]. A significant association was found between fast food consumption, BP levels, and anthropometric indices in another Iranian study among children [26]. Body size has a major impact on the association between intake of the modern dietary pattern and hypertension. Alsabieh et al. 2019 demonstrates that increased systolic BP significantly correlated with an increase in BMI [27]. Both Kar et al and Bahadoran et al. 2015 supports association between increased BMI and fast food [13,25]. Shi et al. 2019 concluded that reducing the consumption of modern fast foods is important to prevent hypertension in Thailand [28]. Higher consumption of fast foods and higher exposure to multiple sources of accessible, cheap, energy-dense fast foods were also accompanied with a 56-162% increased risk of coronary heart disease mortality [13].

Neurodegeneration and psychological changes

Several cross-sectional studies have found significant associations between poor nutritional status and behavioral disturbances, worse cognitive status, and more impaired functioning in adult daily living activities [27]. Fat-filled snack foods may heighten the risk of developing advanced age-related neuro-degeneration, the leading cause of vision and hearing impairment [29]. Researchers from the University of Bristol warn that such poor diets can also permanently damage the nervous system, particularly vision [4]. It negatively affects brain health by damaging regions relevant to memory tasks and by diminishing brain-derived neurotrophic factor levels. This amplifies the risk of developing dementia and Alzheimer's disease later in life [6,27]. Also, presence of depressive symptoms is positively associated with fast-food intake [30] and junk food consumption may increase the risk for psychiatric distress and violent behaviors in children and adolescents [31,32]. A study among Iranian children and adolescents reveals that junk food consumption was significantly associated with mental distress, including "worry, depression, confusion, insomnia, anxiety, aggression, and feelings of being worthless" [33]. In addition, caffeine content of cola and carbonated beverages are responsible for hyperactivity/attention deficit in children [34].

Headache/precipitation of migraine

Monosodium Glutamate is one of the most widely used food-additives in commercial foods. It has linked with obesity, metabolic disorders, thyroid disorders, Chinese Restaurant Syndrome (headache, skin flushing, and sweating), neurotoxic effects and detrimental effects on the reproductive organs [35-39]. As it triggers tenderness of the peri-cranial muscles (most prominent clinical

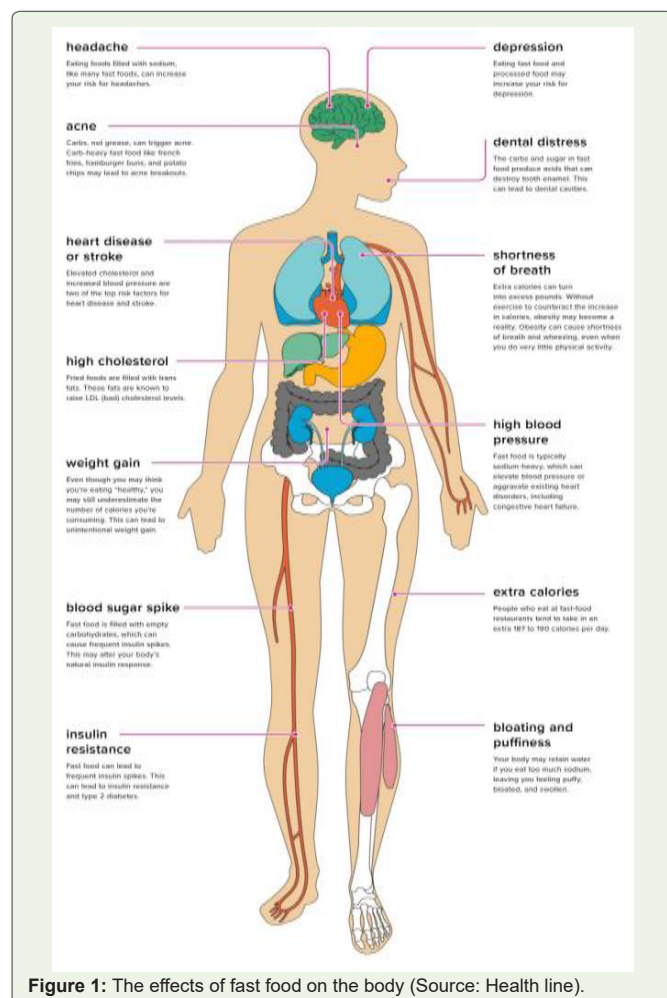


Figure 1: The effects of fast food on the body (Source: Health line).



Figure 2: One Hour after eating a big Mac. The website 'Fast Food Menu Price' created this infographic outlining what happens to body inside after an hour following ingestion of a Big Mac. It also might shed some light on why we all like fast food so much, even though we're aware it's bad for our health (Source: awesomeinventions.com).

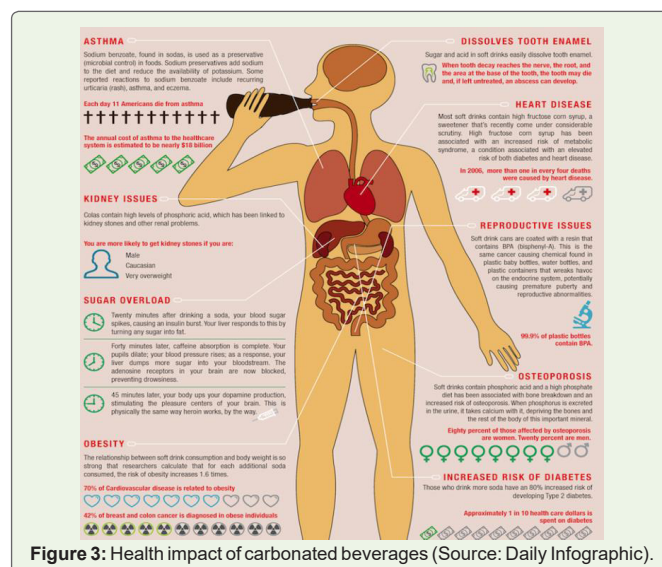


Figure 3: Health impact of carbonated beverages (Source: Daily Infographic).

finding in tension-type headache), people with migraine should strictly avoid it. The absence of a significant relationship between processed meat products and canned foods consumption and migraine headache might be due to people's interest in traditional foods and lack of tendency to consume fast foods in Iran [40]. The interruption of daily consumption of caffeine-containing beverages can cause headache and other symptoms within 8 hours [41]. Also, caffeine abstinence is associated with better efficacy of acute migraine treatment [42].

Physical performance

A Newcastle-based study among elderly people shows that dietary pattern high in red meats, potato or butter may adversely affect muscle strength and physical performance in later life [43]. The fat and sugar levels in junk foods stress the metabolism, causing it to work less effectively. Particularly daily consumption of junk food, may be associated with poorer mental and physical health [44]. Abstaining from junk foods is one way to keep cholesterol levels low and prevent clogged arteries, which can reverse the symptoms of heart disease and improve athletic performance. Excess consumption of junk food can affect the physical as well as mental performance of children. Addiction of junk-food in early age may cause serious illness in later age. The harmful effect of junk-food are overweight, low physical stamina and other health problems among adolescents [45,46]. Also, Stokes et al. 2018 suggested fast food alternatives to young athletes [47].

Cancers and Auto-Immune Disorders

Gluten, another notorious protein responsible for auto-immune disorders, was found in more than 50% pizza and pasta samples in "Gluten-Free" labelled restaurants [47]. A new study in PLOS Medicine finds eating unhealthy food is associated with a higher risk of developing cancer [48]. People who ate the most junk food showed a higher risk of stomach, colorectal, and surprisingly, lung cancers. Separately, men showed a higher risk of lung cancer, and women showed a higher risk of liver and postmenopausal breast

cancers [49]. Nitrate and nitrite, which are abundant in processed meats, are potential carcinogens found in breast, prostate, pancreas, colorectal cancers along with non-alcoholic fatty liver disease and insulin resistance [50-58]. Beyond nutritional composition, neo-formed contaminants, some of which have carcinogenic properties (such as acrylamide, heterocyclic amines, and polycyclic aromatic hydrocarbons), are present in heat treated processed food products as a result of the Maillard reaction, says Cangemi et al. 2019 [59]. Again, Buckley et al. 2019 demonstrated that the packaging of ultra-processed foods may contain some materials in contact with food for which carcinogenic and endocrine disruptor properties have been postulated, such as bisphenol A [60]. Finally, ultra-processed foods contain authorized, but controversial, food additives such as sodium nitrite in processed meat or titanium dioxide (TiO₂, white food pigment), for which carcinogenicity has been suggested in animal or cellular models [59,61]. Interestingly, people hooked on fast food and have limited intake of vegetables and fruits. High salt intake, including salt preserved foods, smoked or dried meat and fish, pickled food, low intake of fresh fruit and vegetables, obesity are among the most contributory to stomach and colorectal cancers [62].

Gut, Bone Health& Premature Aging

A moderate increased risk of irritable bowel syndrome is reported in a French Internet based study [63]. Symptoms of bloating, gas, or pain passing bowel movements may be aggravated by high fast food consumption [64]. Use of Aspartame, a low-calorie sugar substitute in Coke Zero or Diet Coke is still controversial due to possibility of cancer development [65]. Another study says that a high-fat diet alters the structure of the microbiome even in the absence of obesity [66]. Western diet is characterized by a high intake of saturated and omega-6 fatty acids, reduced omega-3 fat intake, an overuse of salt, and too much refined sugar [67]. "Ingestion of sugar, in particular, can accelerate premature aging", says The Journal of Clinical and Aesthetic Dermatology [68], as exceeded free blood sugar promotes cross-linking of skin collagen fibers [69]. Fast food and carbonated beverages often contain large amounts of phosphate additives. This, according to another leading journal *in vivo*, hampers kidney function and bone health [70].

Reproductive health

Over-consumption of cheese, yogurt, modified grains (bread, pasta, crackers, cereals) may jeopardize testosterone, male sex hormone that plays a major role in fertility and sex drive, according to Dr. Michael Hirt, founder of the Center for Integrative Medicine in California [71]. In addition, diets that are low in whole-grain foods, legumes, vegetables and fruits, and high in red meat, full-fat dairy products, and sugary foods and beverages are all associated with an increased risk of erectile dysfunction [72]. An official publication of the Federation of Obstetrics and Gynecological Societies of India says that popularity of junk food in adolescence are responsible for the increasing polycystic ovarian syndrome in adolescent girls and is challenge for gynecologists treating them [73]. Market available ice creams or raita salads in hotel-restaurants are storehouse of *E. coli* bacteria, can be responsible for diarrhea, abdominal cramp, fever, vomiting and uncomplicated urinary infections sometimes [74]. The

so-called condensed milk added as artificial sweeteners is nothing but over-boiled palm oil that deposits in the deep tissues, imparts metabolic disorders and poorly eliminates.

Conclusion and Recommendations

Children and adolescents are exposed to various forms of food marketing while using social media applications, most of which promotes unhealthy foods [75]. Teenagers are aggressively targeted by food marketing messages (primarily for unhealthy foods) and susceptible to this messaging due to developmental vulnerabilities and peer-group influence [76]. Fast-food consumption is associated with lower diet quality [77]. Healthier foods cost nearly twice as much as unhealthier foods per serving on an average among high income countries [78]. Americans allocate more than 40% of their food budget to restaurants and fast foods [40]. The scenario is opposite in Bangladesh. In capital city, people often pay restaurant bills equivalent to more than 500% cost involved in regular meals. Again, traditional fast foods including Singara, Samucha, Puri, Pajju, Lachcha Shemai and Paratha all are generally deeply fried. Commercially available packaged bakery and fast foods often do not contain any declaration of their fat content [79]. Occasional fast food consumption (considered as cheat foods) has been encouraged in various bodybuilding websites, as it stimulates many enzymes that were previously deactivated. But in Bangladesh, Non-Communicable Disease Risk Factor Survey 2013, consumption of inadequate fruit and/or vegetables (<5 servings per day) was found in more than 90% people [80]. Strong advocacy on the detrimental effects of fast food consumption should be routinely done in educational institutions. But Alas! Most fast foods are consumed by youth and children from the nearby shops of educational institutions or the canteens run by the institutions themselves.

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