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"**The Environmental, Social, and Psychological Causes and Implications of Childhood Obesity** "

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Table of Contents

List of Figures 5
Search Methodologies 5
Abstract 6
Introduction to Childhood Obesity 7
Obesity: A Societal Shift 7
Outline of Epidemiology of Obesity 9
Main Essay Body 10
A Historical Development of Modern Obesity 10
Defining a Modern Epidemic 11
BMI: A Critical Perspective 12
Nutritional Development of Obesity 13
Changing Daily Activity Levels 14
Processed Foods 15
Impact of Sugar and Artificially Heavy Diets 16
Food Preparation. 17
Parents and Additional Environmental Factors 18
Parents in the Labour Force. 19
Parents Influence on Exercise. 19
Parents and Media Devices 20
Parents and Average Income. 20
The Negative Potential of Advertising 21
The Positive Potential of Advertising 23
Potential Effects of Advertising on Body Image 24
Social Media and Cyber Bullying. 24
Physical Side Effects of Childhood Obesity 26
Hypertension and Heart Disease 27
Cholesterol. 28
Psychological and Social Consequences of Childhood Obesity 28
Body Self-Consciousness. 29
Progressive Shift in Body Standards. 30
Body Image and Emotional Wellbeing. 31
Potential Solutions: A Positive Conclusion 31
Future Directions in Intervention Research. 33
References 35

List of Figures

Figure 1: The Average BMI of American Adults over Fifty Year – Page 11

Figure 2: Pie Chart of Average American Diet 2019 – Page 14

Figure 3. Average Sugar Consumption Over Time – Page 16

Search Methodologies

The databases used for this paper include but are not limited to Google Scholar, PubMed, and Web of Science. Key search methods centred around six core search terms, "childhood", "obesity", "causes", "implications", "environmental factors", and "nutrition". From these search terms, new terms emerged relating to interventions surrounding childhood obesity, the role of the parents as an environmental factor, and the role of advertising in accentuating pre-existing nutritional tendencies. This paper adopted a rather organic approach to the research with a definitive goal but an evolving method to data collation. As this paper encompasses a historical account of childhood obesity development, there were no set date ranges, however, where possible, an attempt was made to draw upon contemporary academic work rather than potentially outdated research.

Abstract

It is widely acknowledged that obesity is a growing epidemic in contemporary society where an unstoppable upward trend is evident in recent decades. Such an increase has largely been predicated on increases in caloric intake and sedentary lifestyles, culminating in surplus calories contributing to the average weight skyrocketing. However, due to their relatively dependent and indeed, impressionable nature, factors contributing to childhood obesity are inherently more varied. This paper examines the environmental, social, and physical factors that can lead to the accentuation of predisposed biological food tendencies. Furthermore, this paper examines the role of parents and how they can often make such predispositions decidedly worse. Moreover, the role of contemporary, socially dominant means of entertainment is discussed in relation to its contribution to reducing the frequency of exercise and increasing the desire for unhealthy food. The role of advertising within this media context is also discussed and how it fosters an increased proclivity to eat unhealthily. Furthermore, the damaging social, psychological, and physical effects childhood obesity can have on normal childhood development is discussed in detail to better understand the ramifications it can have. Finally, an examination of potential ongoing solutions and how although the family can be a source of increasing the frequency of unhealthy eating that it can also be the primary source of improvement. Moreover, the use of parent led interventions and targeted social advertising from non-government organisations is discussed to reduce the many physical and psychological complications associated with childhood obesity.

Keywords: Childhood Obesity, Parental Contribution, Food Types, Social and Psychological Effects.

Introduction to Childhood Obesity

As society has developed to become more affluent and less subsistence based, Western nation states have seen a rapid rise in the rates of obesity across all demographics (Farhat *et al.* 2010). Indeed, this rapid rise has been characterized by several persistent nutritional deficiencies and a high comorbidity with illnesses such as diabetes, cardiovascular disease, and cancers (Sahoo *et al.* 2015). As a result, in contemporary society, obesity is solely responsible for 20% of all fatalities on a global scale making it one of the more common and deadly causes of death (Lavie and Ventura 2015). This statistic is somewhat daunting as consistent overeating is rarely seen as a problem that could lead to serious health implications, yet it presents as one of the more severe medical challenges facing nations today.

Thus, this paper aims to examine the epidemiological origins of the modern obesity epidemic, specifically looking at the effects this can have on children in contemporary society. Through this consideration, this piece will focus on the role of parents, wider contemporary culture, and other environmental factors. An examination of both the physical, social, and psychological repercussions of being overweight will be discussed. Finally, this paper will focus on some potential solutions surrounding dietary awareness and education, as well as an increased focus on moderation in contemporary diets through the use of parent-led interventions.

Obesity: A Societal Shift

The prevalence of obesity is evident, however, the scope of its impact rather less so. Indeed, the conceptualisation of obesity as a societal issue is only a relatively recent construct. Although the prevalence of obesity has reached epidemic levels in Western states where the highest rates have been witnessed, developing nations are not immune to increasing rates of obesity (Popkin and Doak 1998). Indeed, Popkin and Doak (1998)

document that shifts in dietary choices and daily activity levels due to large amounts of urbanization will push such countries towards the same epidemic experienced in Western nations.

This societal shift has occurred alongside a perceptual one, where historically, additional weight was seen as a visible gauge of affluence (Wadden and Stunkard 1985). The association between prosperity and excess weight was one born from the prevalence of famines and the risk of starvation for lower classes. This trend was present in wider culture, and thus, there was a social pressure to align with societal ideals (Wadden and Stunkard 1985). The first documented shift of this viewpoint is evident in the early 1900s, however, it was slow to take hold. Thus, as the world become progressively more industrialized, it only facilitated further weight gain within the wider population.

Indeed, the widespread positive social perception of obesity was systemic within all age categories for a large part of history (Drewnowski 2009) and in contemporary society such trends have even permeated into children in poorer developing nations (e.g. Raj *et al.* 2007). Although location dependent, the social perception that an increased body weight is viewed as socially desirable is an incredibly damaging standard from a physical health perspective.

As a result, childhood obesity in the 21st century stands as perhaps one of the most pervasive and serious public health challenges ever witnessed (Veugelers and Fitzgerald 2005). Childhood obesity is largely the result of an increased caloric intake, above what is required by the human body to function appropriately, thus, causing the body to store excess fat (Katan and Ludwig 2010). However, a solution to the problem is not easy to develop, as the mechanisms by which such a caloric intake occurs are not yet fully understood (Sahoo *et al.* 2015).

Outline of Epidemiology of Obesity

Contributing factors are varied and encompass a range of environmental aspects, lifestyle, and dietary differences, cultural and social standards, as well as exercise rates and exposure to advertisements (e.g. Kumar and Kelly 2017). Nonetheless, what is unquestionable is the far-reaching implications obesity can have on children's physical health, their social, and psychological wellbeing, and their ability to develop positive self-esteem (Cheng and Furnham 2018). In 2010, 42 million children below the age of 5 were classified as morbidly obese (World Health Organisation 2000) with over a third of children in Ireland classified congruently (Harrington *et al*. 2009)

For this paper childhood will be defined as individuals from birth through to age seventeen (Buckingham 2002). A distinction will not be made between early childhood and adolescence for this paper as often it is difficult to distinguish symptomatology between these two life stages (Sommer and Twig 2018). Indeed, it is rare that causative problems will transform from childhood to early adolescence and thus, the need for individual attention is reduced. Although, when such causative circumstances do occur they are usually congruent across this cohort of the population (Sommer and Twig 2018). Consequently, social media and how it can influence body ideals will be discussed due to its increasing pervasiveness in children's lives (Marengo *et al.* 2018).

Indeed, one cannot hope to gain a proper understanding of this issue without analysing the problem in its full historical context and how it has evolved over time. Thus, it is important to examine how contemporary food products play a crucial contributory role in the development of obesity. Moreover, examining cultural and societal differences in the development of this growing issue will be a crucial component of theorizing effective intervention strategies to reduce the impact on children's welfare on a global basis. Finally,

this paper will suggest some potential solutions and mechanisms by which society and families can work to manage and potentially reduce obesity globally.

Main Essay Body

A Historical Development of Modern Obesity

In modern society obesity and childhood obesity are major epidemiological issues facing healthcare workers (Farhat *et al.* 2010). However, it may be somewhat surprising that obesity as a global disease with pathological consequences is less than a century old, with the largest increase in prevalencey witnessed in the past 40 years (Eknoyan 2006). As mentioned previously, historical food shortages and famines contributed to the idea that increased weight was desirable, and coincidingly, this was reflected in wider society. However, with the onset of the 20th century, being overweight began to be seen as socially undesirable due to the learned association between excess weight and increased risk of illness (Eknoyan 2006). Indeed, modern understandings that obesity is associated with an increased risk of dangerous and life-threatening diseases such as diabetes, stroke, and coronary heart disease were not well established. Understanding how these social perceptions changed alongside our dietary and lifestyle choices is an important step in comprehending the juncture presented to society today.

Historically, from the mid 1890's to 1970's the weights of individuals remained consistent (Eknoyan 2006). The economic depression meant households had very little income available and survived mostly by self-sustained means, growing their own crops, milking their own cows etc. During this period, the average income was lower, therefore buying anything that did not directly contribute to survival was deemed unnecessary, and thus, a luxury. Indeed, this coupled with a less industrialised world and therefore, a reduction in the variety of goods meant little was available that by modern standards would be considered 'junk' food. Ultimately, when one considers both factors it is clear why obesity

was relatively uncommon and only occasionally witnessed in the wealthiest of society. Moreover, the association between weight obesity and wealth was primarily born out of such an economic climate. However, in the mid 1980's individuals weight began to rapidly increase (Oliver 2006)

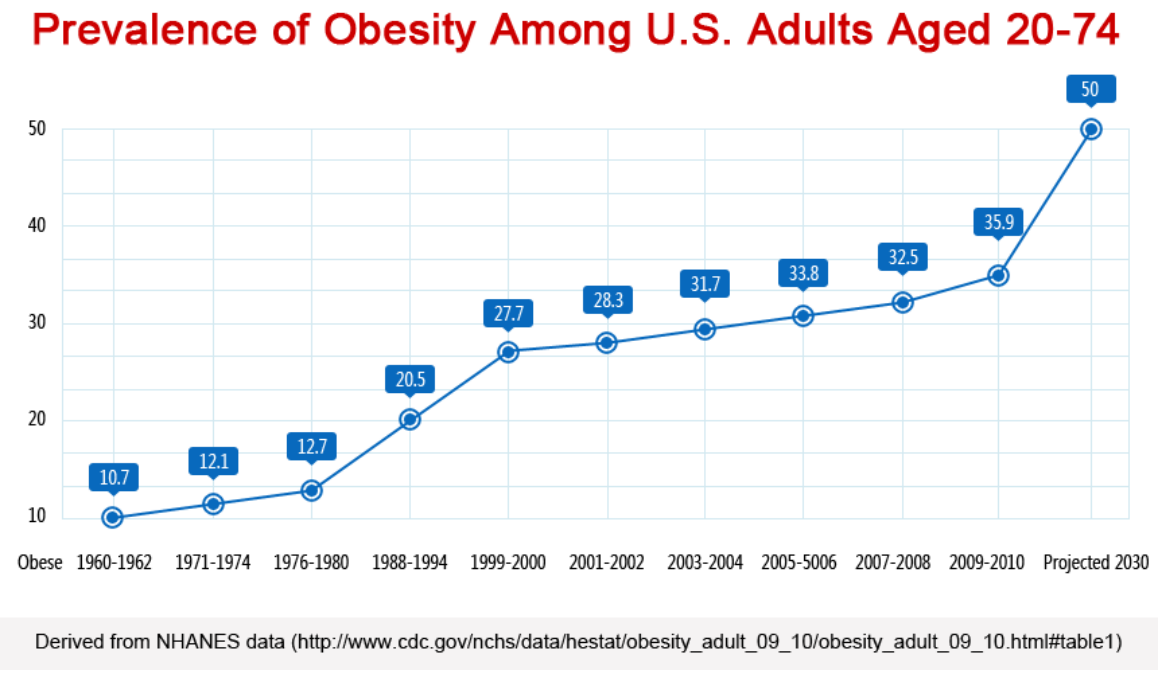

Figure 1. The Average BMI of American Adults over Fifty Years.

On average a weight gain of 25lbs extra was recorded (Mozaffarian *et al*. 2011). Indeed, this figure is unsurprising considering individuals were eating 25% more calories daily (Mozaffarian *et al*. 2011) and carrying out physical activity at record low levels (Tremblay *et al.* 2010). Moreover, due to increased automation and industrialisation, society had largely moved away from the necessity of every role to encompass large amounts of manual labour and therefore, caloric output for a lot of workers was reduced (Mark 2005).

Defining a Modern Epidemic

As discussed, social perceptions of obesity have changed over time and likewise, so too has the classification of what medically constitutes obesity (Mark 2005). Generally, it can

be defined as an excess of body fat that poses a risk to one's health (Sahoo *et al.* 2015). In adults, obesity is commonly classified by having a body mass index (BMI) above 30kg/m^2. One's BMI is derived by dividing one's weight by the square of their height (Malina and Katzmarzyk 1999). Although BMI is an accepted approach for identifying obesity, one of its biggest limitations is it doesn't account for significant muscle mass so for an athletic individual it can be sometimes be inaccurate (Ogden *et al*. 2008). However, for the general population it remains a relatively accurate means of derivation for adults, yet it's applicability for children is limited (Cole *et al.* 2000). Indeed, BMI tends to have high specificity, but a rather varied level of sensitivity in children and adolescents (Malina and Katzmarzyk 1999).

BMI: A Critical Perspective

This is largely due to the fact BMI in childhood has a substantial variation with age (Cole *et al.* 1995) fluctuating between as low as 13kg/m^2 at birth to 17 kg/m^2 at one year old and dropping again at age six (Ogden *et al.* 2008). However, alternate means of classification have been proposed for children centring around the relationship between their height and weight. Essentially, a child is classified as obese when their weight gain is disproportionate to their change in height, meaning a gain of excess body fat above what would be expected from normal developmental processes (Júlíusson *et al.* 2018). In children this is measured on a percentile chart which compares children that are of the same age. Children and adolescence between the 85th and 95th percentile on the chart are considered overweight, and those above this figure they are classified as obese (Júlíusson *et al.* 2018). However, the existing standard of this definition has come under criticism for being rather arbitrary and reductionist as the date used to derive this classification was based exclusively in the United States (Cole *et al.* 2000).

Cole *et al.* (2000) argues that age and gender need to be considered through age and gender specific BMI cut off points when identifying overweight individuals and obesity in

children. Specifically, special allowances should be made once males reach a developed stage in their adolescence as the presence of muscle mass can skew BMI results. However, this can be mediated by simple visual inspection to ascertain whether the individual is at risk of being classified as obese. Such cut off points allow for more accurate classification on an international level and serves to facilitate nationally comparable prevalencey rates more precisely (Cole *et al.* 2000). Due to the public health implications associated with childhood obesity, accurate measurements are important to appropriately monitor the situation. Indeed, just as important as accurately measuring contemporary rates of obesity is understanding the root cause and historical development of how this health epidemic came to be. Such analysis will be vital for developing appropriate strategies to improve the health of children worldwide.

Nutritional Development of Obesity

Indeed, there is evidence to suggest that rather than this weight gain being solely attributable to lowered caloric output and increased caloric intake, that the types of food one ate may have also have played a role. These ‘nutrition transitions’ were marked in large part by the increased production of vegetable oils and fast foods becoming dietary staples (Popkin *et al.* 2012). Notably forty years ago, there was more omega-6 than omega-3 in standard diets of unprocessed meat, dairy, fruits, and vegetables. However, today there is more than twenty times the amount of omega-6 in one’s daily diet largely due to an increase in processed oils (Simopoulos 2006). This can interfere with absorbing the naturally present omega-3. High absorption rates of omega-3 has been showing to be associated with feeling satiated after food (Dyall and Michael-Titus 2008). Likewise, low absorption rates have been linked with inadequate levels of satiation and thus, individuals are more likely to continue eating to feel full (Kris-Etherton *et al.* 2002).

Ultimately, lower absorption rates of omega-3 have been showing to be linked with a higher potential for overeating, and thus, an increased caloric intake (Parra *et al*. 2008). Indeed, evidence of this can be seen in places such as Asia where a lower amount of processed food and oils are consumed (Lipoeto *et al.* 2013). Thus, the presence of omega-3 is higher due to diets rich in fish and unsurprisingly, obesity is not as severe of an issue (Parra *et al.*2008). Although this is only one reason that obesity is lower in Asian countries it is an important consideration nonetheless. Moreover, the increase intake of processed sugars (sucrose) has seen people intake over 300 calories a day from added 'caloric sweetener' (Popkin *et al*. 2012). Research argues that humans have an innate predisposition towards fat-based foods and dietary sugars (Drewnowski 2009). Specifically, sweetness serves as a prominent cue for energy in children globally. However, as children age they develop a sensory regulation for sweet food, but do not do so congruently for fats (Drewnowski 2009). It is little surprise then that food products targeted at children frequently contain a large amount of fats and sugars.

Changing Daily Activity Levels

However, this is alone is not responsible. Children's average daily activity has plummeted in recent decades due in part to the emergence of video games, social media, and other factors that limit exercise. Indeed, current statistics show that the number of children getting an adequate 60 minutes of exercise per day for normal development has fallen by over 40% in recent years (Riddoch *et al*. 2004). This figure continues to reduce up to age 15 where it will bottom out for most teenage boys and girls. The benefits of adequate amounts of physical exercise are extensively documented and is indicative of inverse relationships with many physical illnesses such as cancers and diabetes (Riddoch *et al*. 2004). The lack of exercise is not only attributable to technological advancement but also can be limited by a number of socioeconomic factors which only serve to further detract from healthy amounts of

exercise. However, as mentioned previously the lack of contemporary exercise is not the only reason, rather the increased intake of processed foods and targeted advertising at children for such products plays a unique role.

Processed Foods

Indeed, many of the company's advertising online, particularly on websites frequented by gaming enthusiasts are involved with the production of heavily processed foods. These foods tend to be high in sugar and high-fructose corn syrup. Moreover, such high levels of processed foods often contain refined oils and fats as well as excess refined flour and starches (Popkin *et al.* 2012). Processed foods tend to be commonplace in contemporary cupboards in the form of confectionary and frozen goods such as pizzas and burgers. However, when such products are consumed in moderation as part of a health and balanced diet they tend to not be detrimental to healthy food intake (Monteiro *et al.* 2013). Nevertheless, due to their intense palatability, high prevalence on supermarket shelves and rather pervasive marketing strategies, the likelihood of such consumption is rather low (Monteiro *et al.* 2013). Specifically, special discount offers or buying in bulk only serves to accentuate the likelihood of increased consumption especially around sugar-based products (Monteiro *et al.* 2013). Sugar essentially has zero nutritional value besides the large amount of energy it contains, therefore it is commonly referred to as 'empty calories' (Choo *et al.* 2015).

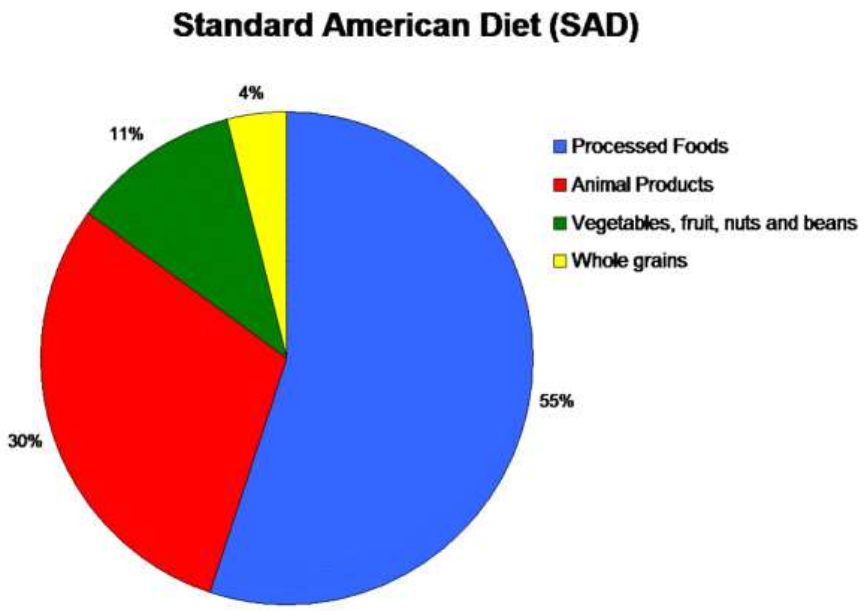

Figure 2. Pie Chart of Average American Diet 2019

Impact of Sugar and Artificially Heavy Diets

Moreover, sugar can have a detrimental effect on metabolism and has a close link with the development of metabolic syndromes (Stanhope *et al.* 2013). Metabolic syndrome includes a cluster of metabolic conditions that may contribute to heart disease this includes insulin resistance, hypertension, abnormal cholesterol, and increased risk of blood clots (Basciano *et al.* 2005). Processed foods are engineered for overconsumption and are incredibly rewarding for our brain, affecting our thoughts and behaviour inevitability leading to overconsumption (Krebs 2009).

Additionally, the artificial ingredients in processed foods have been shown to have serious side effects, especially in children, causing hyperactivity, and attention deficit hyperactive disorder (ADHD) (Harpin 2005). ADHD may cause children to have academic difficulties, finding it tough to concentrate in a normal schooling environment due to lack of social skills and poor concentration levels (Harpin 2005). High contents of refined carbohydrates cause a quick spike in blood sugar and insulin, this can lead to high cravings when blood sugar levels drop. These cravings can cause children to act out in a hope to be

given more of these sugar snacks (Barr and Wright 2010). Here, there is clear physical and psychological detriments to eating foods that are highly processed.

Furthermore, Barr and Wright (2010) showed the difference in energy expenditure between whole foods and processed foods. Whole foods take longer to digest hence keeping one fuller for longer and use more energy for digestive purposes making it easier to maintain a positive energy balance. Contrastingly, processed foods are digested easily using very little energy. The availability of processed foods and the convenience makes them attractive in the busy modern society. Indeed, recently there has been a progressive push towards whole food and organic produce, yet, the prevalence of processed foods is still notably high. One potential contributing role is that of the parents. In contemporary society, adults have less time than ever due to a stringent work life balance and thus, this impacts the decisions they make in relation to what they perceive to be less important issues such as food intake (Craig 2016).

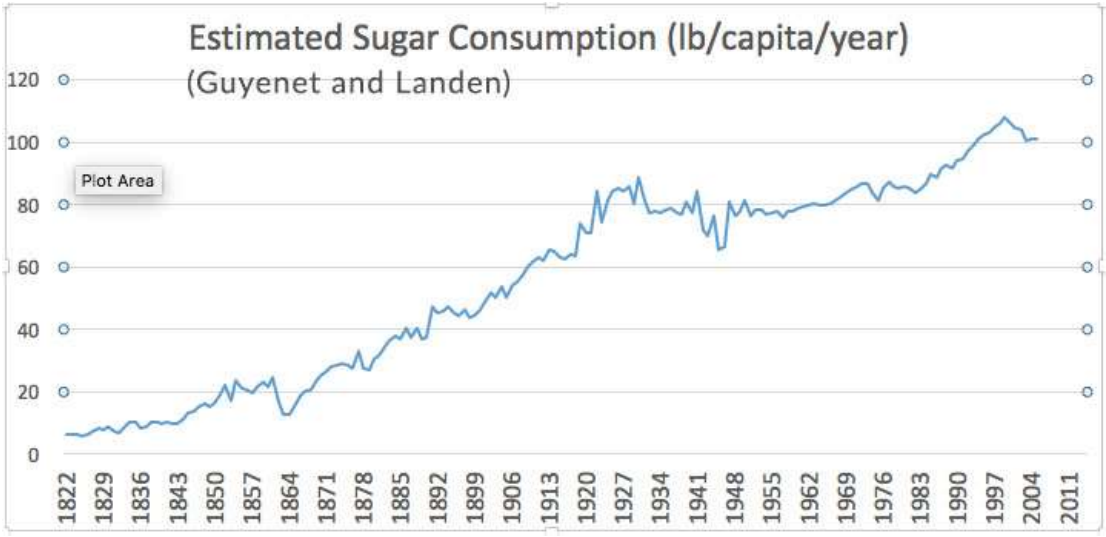

Figure 3. Average Sugar Consumption Over Time

Food Preparation.

Per Lindsay *et al.* (2006) few parents have control over their work schedule and thus, work under constrained conditions to maximize meaningful interpersonal time between

family members meaning there is often a lack of time for processes outside of these close interactions. Once such place is preparing lunch and dinners for their childrens which is much easier with convenient processed foods that children find enjoyable (Buckley *et al.* 2007). However, as previously mentioned taste is not always indicative of nutrition, and indeed, often is indicative of poor nutritional choices and large amounts of unnecessary calories. One of the most underestimated detriments of such nutritional choices is the potential to adversely affect brain function, and in turn, limit cognitive processes and behavioural outcomes (Harpin 2005). Indeed, even short-term interruptions from spikes in caloric intake on normal brain function can impact behaviour (Harpin 2005). Given the dependent nature of children for their nutritional standards, as well as the provision of food from their parents, the role of the parents is crucial in providing meaningfully healthy nutritional guidelines. It is therefore important to consider are parents a contributing cause of childhood obesity.

Parents and Additional Environmental Factors

Such is the importance of the role of parents in childhood nutritional standards that it has manifested as a common topic in academic analysis. Per Lustig *et al.* (2012) parents and caregivers play a vital role in the healthy nutritional advancement of their children. Indeed, not alone do individual factors such as time and commitment to such advancement play a role but equally, parents food preferences and the types and amount of such foods (Wadden and Stunkard 1985). Moreover, external factors such as physical activity frequencies and encouragement of such exercise play a role in establishing an environmental proclivity to developing obesity (Israel *et al.* 1990). Although children have a biological predisposition to like sweet, fatty, or salty foods, they develop solidified food behaviours through environmental exposure and habit formation (Kumar and Kelly 2017).

Current research indicates that due to the parent's decisive role in regulating food intake for their children as well as providing experiential learning that early exposure to either health

or unhealthy food habits will maintain throughout the child's developmental cycle (Wadden and Stunkard 1985). Indeed, children's food-based predispositions are only further pushed towards unhealthy sources if parents consciously try to restrict children's food types which have the exact opposite of the desired effect. Such restriction pushes children away from normal self-regulatory behaviour and instead assists the development of preferences for high fat foods (Birch and Fisher 1998). However, given the limited time of many parents in contemporary society, and the readily available and often financially affordable nature of less nutritious foods, it is little surprise parents are struggling to provide nutritious diets.

Parents in the Labour Force. Indeed, the number of children with a single or both parents in the labour force in the past thirty years has changed dramatically. Inevitability this means parents have less time, which effects their ability to prepare nutritious meals (Wu *et al.* 2013). This is partially responsible for the increase in value that is placed on convenience-based foods. Such foods are often low in nutritional value, and overall only serve to save time at the expense of one's health, and, in turn, solidify poor food regulatory behaviour. It is undoubtable that the lowered prevalence of home cooked meals is a contributing factor to children's increased weight gain (Hughner and Maher 2006). Thus, children form their preferred food choices in line with those that they see their parents consuming and likewise, the food types they are provided with. However, the prevalence of obesity would not be where it is today due solely to an increase in poor dietary choices. Rather more detrimental due to the nature of weight gain- calories in vs calories out- is the lowered proclivity to exercise.

Parents Influence on Exercise. Indeed, such a scenario means that not only are children inputting more calories but equally, are outputting less. One contributing factor to this is that the contemporary level of parental employment comes with increasingly hectic schedules which often results in children being dropped to school or taking buses rather than

walking or cycling with their parents. This was a common practice in past decades but has since diminished in commonality (Veugelers and Fitzgerald 2005). Moreover, parents are finding it more difficult to actively engage their children in outdoors exercise due in large part to the increased prevalence of online entertainment and access to media devices (Veugelers and Fitzgerald 2005).

Parents and Media Devices. In 2018 it was reported that sixty-one percent of children have at least one media device in their bedroom (Lee and Fulkerson 2018). The availability of technology to children is largely due to the busy lives of the parents, in turn leading to a necessity for finding an easy means of entertainment which has inevitably led to a lack of interest in outdoor activities and sports (Mandic *et al.* 2012). In many ways, parents are attempting to placate their children and create a more relaxed environment for themselves leading to parents ultimately giving in to their children's demands (Henry and Borzekowski 2011). This leads to a reinforcement process where children, through targeted advertisement available on such devices are consistently exposed to many food-based media channels and pages thus, increasing their desire to receive these foods types (Jordan 2004).

Parents and Average Income. This is a concerning problem due to the often-low cost of these processed food products. Indeed, some parents in the modern socioeconomic climate can only afford processed food products, and thus, are caught in a poverty trap. Healthy foods are expensive and not affordable for families on a tight budget (Henry and Borzekowski 2011). Specifically, individuals who receive adequate nutrition tend towards being more energetic due in large part to the nutritional foods (Hill 2002). Indeed, not only do adequate foods impact children's energy levels but also their sleep patterns which leads to lowered academic and social development, in turn, perpetuating the nature of the poverty trap (Halson 2008).

A study using logistic regression was used to examine the association between obesity in children and lower income housing. One of the many reasons responsible for this is the location of the shelters or low-cost housing, more than likely they are in disadvantaged areas where fast food restaurants thrive and access to healthy foods and exercise amenities are restricted. The results of the study showed children living in low income housing were significantly more likely to be obese compared to their counterpart (Nobari *et al.* 2019). Indeed, such social groups tend to watch a disproportionate amount of television largely due to lack of meaningful forms of external entertainment, and secondarily, because it can often take the form of a babysitter in busy parental lives. Thus, such sociodemographic groups are subject to be highly influenced by forms of advertising.

The Negative Potential of Advertising

Another factor contributing to childhood obesity is the glorification of processed food to children through advertising. Specifically, food and drinks marketing has been associated with an increase in non-nutritional food intake, food requests, and notably, obesity (Velazquez *et al*. 2017). Some marketing techniques to increase product attraction to children are the inclusivity of heavily processed sugar snacks being placed on children's eye level making it more accessible. The use of colourful wrapping and the use of their favourite cartoon characters also attracts children to the highly processed products (Siham 2013). A lot of these highly processed items marketed to children are everyday products such as breakfast cereal (Mehta *et al.* 2012).

In social discourse as well as through academic support, consuming breakfast has been associated with a reduced risk of becoming overweight or obese as opposed to skipping breakfast (Ruxton *et al.* 1993). It is also associated with improved cognitive performance and enhanced mood throughout the duration of the day (Velazquez *et al.* 2017). However, as mentioned ready to eat cereals are the most popular choice of breakfast foods consumed by

children (Ruxton *et al.* 1993*).* It's not surprising ready to eat cereals are the most popular breakfast choice considering they are often high in sugar and are the most frequently promoted food product advertised on television for children (Stanhope *et al.* 2013). This is worrisome considering sugar consumption and added sugar is directly linked to obesity. The clever use of popular cartoon characters promoting foods to children as healthy is one of the many methods used by corporate advertising.

Indeed, 91% of these advertisements convey an unrealistic expectation of the product, some portraying the ability to have extraordinary powers and improbable strength leading children to believe such 'powers' would be bestowed upon them through consumption of the product (Stanhope *et al.* 2013*).* On the contrary, the study showed adults viewed half as much advertisements as children and there was equally as many low sugar cereals as high sugar cereals being advertised. It is clear that advertisers are playing on children's vulnerability and inability to make educated decisions. Most assuredly, the encouragement of unhealthy eating is increasing the rates of childhood obesity through the use of targeted advertising. Similarly, a study carried out in New Zealand which used a nutritional profiling system was used to classify cereals as 'Healthy' and 'Less Healthy' cereals for children portrayed more promotional characters and were deemed as 'Less Healthy', highly processed and have been found to increase total sugar consumption and decrease overall nutritional quality of their breakfast (Gornall 2015).

Moreover, children find it difficult to listen to their natural hunger and satiation and therefore can easily overeat (Oliver 2006). It's not surprising that children are swayed when over 12 billion dollars each year is spent on advertising to target the youth market (McNeal 1991). Additionally, the children's menu in restaurants often promote unhealthy options putting children in a vulnerable position. A report in 2012 examines the nutritional quality of some meals in eighteen of the most popular restaurants across the United States. The study

showed that less than 1 percent of kid's meals met the recommended nutritional standards for children (Sahoo *et al.* 2015). The lack of nutrition in these menus leaves the children feeling unsatisfied and making it easier to over consume daily calories. Therefore, with the types of food available to children it's easy to see why weight gain, leading to obesity is so problematic in the Western world.

Indeed, research has shown that many products promoted for children contain high amounts of sodium, saturated fats, and upwards of 30% sugar in some products (Elliott 2008). These products often contain little nutritional value but instead help to facilitate cravings (Velazquez *et al.* 2017). This problem has become so alarming that the World Health Organisation has advised countries to regulate the amount of food directed advertisements children can be exposed to daily (World Health Organisation 2000). Canada is one country that has become an example for how such targeting should be monitored and is an example of how the effect of advertising can be reduced positively.

The Positive Potential of Advertising

Congruently, in recent years there has been some positive health messages delivered through advertising. In Ireland the national dairy council has put a huge emphasis on eating more Irish dairy products. They inform the consumer on the benefits of dairy as a whole and do not promote any particular brands. Along with television adverts they have a website explaining why everyone should include dairy in their diet along with some healthy tips and recipes and portion sizes. The adverts are targeted to all members of the general population, featuring children, adults and the elderly(https://www.thecompletenatural.ie/fact-not-fad/). A diet rich in dairy and other protein sources for children has an important impact on bone mass continuing into adolescence (Moore *et al.* 2008). Many individuals cut dairy out due to its high fat content, however, this can have reverse effects. The fat in milk increases high-density lipoproteins which in fact reduces the risk of cardiovascular disease and diabetes .

Also, research showed when less dairy was consumed by children , the amount of sugar sweetened beverages consumed increased (Moreno *et al.* 2015). Moreover, in 2007 Mars chocolates became the first company to announce that they will no longer advertise their products to children under 12 years and in doing so, they were also the first chocolate company to voluntarily put nutritional information on the front of the wrappers. They provide the information to parents to empower them to make the best decisions for their families and to occasionally allow such goods as part of a balanced and healthy diet (Gornall 2015).

Potential Effects of Advertising on Body Image

However, advertising can also have a direct link with an unhealthy body image leading to unhealthy weight controlling behaviours for children and adolescents (Grogan 2016). Models seen on television or magazines represent an idealistic image which is unhealthy and difficult to achieve (Kim and Chock 2015) . The discrepancy between the average and ideal has dramatically, models used to weigh 8% less than the average woman but now weigh 23% less. This alarming dissatisfaction with body image from a young age results in one of two extremes in weight-related disorders, obesity and disordered eating (Borzekowski and Bayer 2005).

Social Media and Cyber Bullying. Social media has become a portal for entertainment and communication in today's youth. Sites such as Facebook, YouTube, Instagram, Snapchat, and Twitter are social media sites that can enhance communication and technical skills of children today (O'Keeffe and Clarke-Pearson 2011). Identified benefits of digital and social media for children and adolescents include exposure to new concepts and ideas making it easy to access information and helps to facilitate early learning such as literacy and numeracy skills. It is clear the that the use of games designed to help critical thinking and problem solving can have a positive effect on a child's intellectual skills. Access to movies and tv shows based on books can encourage reading as well as a cultural

experience through access to historical movies can give an insight into previous years in history (Cheston *et al.* 2013).

Thus, the infinite amount of benefits digital and social media has on children and adolescents is evident, however, the downside of social media cannot be ignored. However, one of the many detriments of social media is the negative impact on the mental health of children. The most common being body dissatisfaction which is defined by having negative feeling towards one's own body weight, shape, or body parts (Simmons *et al.* 1973). It's recognised that having body dissatisfaction often leads to disordered eating (Haines and Neumark 2009). Social media has a huge part to play in the perception of how one should look, creating an almost perfect idealistic picture of oneself and indeed, when one fails to align to such an ideal, cyberbullying can often occur. Cyberbullying is the use of digital media to communicate in an intimidating and threatening nature (Beale and Hall 2007). The pernicious effects of cyberbullying include low self-esteem, depression, suicide ideation and suicide. Moreover, low self-esteem can manifest many unhealthy eating behaviours (Tiggemann 2005).

Children with low self-esteem tend to not care about eating nutritious food and tend to pick up sugary snacks to attain momentary releases of happiness, this can easily lead to emotional and binge eating which in turn can manifest into childhood obesity and poor nutrition (Gibson 2012). As well as this children and adolescents expressing symptoms of low self-esteem tend to engage in high risk activities such as smoking and consuming alcohol (Gibson 2012).

Studies show that females are more likely to misperceive their weight, which can cause a negative relationship with their body image leading to many physiological implications (Perrin *et al.* 2010). Social media has a huge part to play in setting unrealistic standards for body image. Often characters in tv shows and movies are portrayed by size, the

pleasant and romantic characters are thin compared to the evil character who is often overweight. Children make a comparison to themselves and these characters leading to feelings of shame about their bodies and lowered self-esteem, which can ameliorate unhealthy eating behaviours (Tatangelo and Ricciardelli 2017).

Another point to note is the obsession with food across social media platforms, restaurants and over 3 million individuals taking pictures of mouth-watering food and posting across their social media platforms (O'Keeffe and Clarke-Pearson 2011). Children are engaging with these photos on a daily basis, liking, tagging, and sharing, which is inevitable providing encouragement to opt for unhealthy choices when eating out. These multisensory mental images are a huge stimulator to high cravings of calorie dense food. Indeed, such a proclivity to unhealthy eating enhanced through social media, advertising, and many environmental factors has the potential to be innately damaging to children's physical wellbeing.

Physical Side Effects of Childhood Obesity

The relationship between disease, illness, and childhood obesity has become increasingly apparent in recent years. The most frequently examined and reported comorbidity health risk associated with childhood obesity is cardiometabolic syndrome (Srivastava 2012). Cardiometabolic syndrome is a disease recognised by WHO and characterised by a cluster of metabolic dysfunctions such as insulin resistance, impaired glucose tolerance, and hypertension. (Srivastava 2012). Obese children are significantly more likely to have two or more risk factors for heart disease and type II diabetes and fatty liver disease compared to normal weight peers (Denney-Wilson *et al* 2008). This is alarming due to the consequences of these diseases and high mortality rate. Moreover, heart disease can cause detrimental effects such as heart attack, stroke, or angina as time progresses. For a child to be predisposing themselves to such diseases at such an early age is dangerous. Children are

drastically decreasing their life expectancy without even realising it (Eknoyan 2006). The increased risk of such diseases is provoked by weight gain particularly an increase in intra-abdominal fat accumulation which is mirrored by having a large waist circumference.

Hypertension and Heart Disease. Likewise, hypertension also known as high blood pressure has no symptoms and children may have it without even realising. The prevalence of this common disease in children is estimated at between 2-5% (Hansen *et al.* 2007). The causes of hypertension in children have been shown to correlate to a family history of hypertension, a low birth weight, and most crucially, excess weight (Hansen *et al.* 2007). Due to the increase in childhood weight problems and obesity attention to weight related health conditions permit more attention (Must *et al.*1999).

Unfortunately, hypertension at childhood is considered an independent risk factor for hypertension in adulthood. The danger with such a diagnosis is the increased risk of heart attack, stroke, heart failure, kidney failure and poor circulation to one's legs (Hansen *et al.* 2007). Obese children are significantly more likely to have two or more risk factors for heart disease and type II diabetes and fatty liver disease compared to their normal weight peers (Denney-Wilson *et al* 2008). For a child to be predisposing themselves to such diseases at such an early age is dangerous (Freedman *et al.* 2001).

Not alone are children harming their childhood but are unfortunately, leading themselves into increased health risks at adulthood. The recognition of hypertension in patients is causing paediatricians to be inundated with referrals, and moreover increasing the existing mortality rate. This is a result of the consensus guidelines defining childhood hypertension as a blood pressure result based on measured at or higher than the 95^{th} percentile for age, sex, and height on three different visits to the paediatrics (Hansen *et al.* 2007). Numerous normal and abnormal cut-offs exist, which are difficult for paediatric clinicians to remember and apply. This leads to undiagnosed hypertension and

prehypertension in children, which puts them at a greater risk of serious diseases due to their excess weight (Sommer and Twig 2018).

Cholesterol. Another important risk factor associated with childhood obesity and linked to hypertension is high cholesterol. This is a waxy substance found in blood that is used to create healthy cells, however, too much of this can build up and deposit in blood vessels, increasing the risk of heart disease (Dietschy 1997). High cholesterol is extremely prevalent in obese children with approximately 25% being diagnosed with the condition. Congruently, high cholesterol leads to high blood pressure, both of these meet the criteria for metabolic syndrome (Boyd *et al.* 2005). Causes of high cholesterol include food which have a direct effect on blood cholesterol, such as food high in saturated and Trans fats. Low activity levels also contribute, by increasing levels of low-density lipoprotein (LDL) which is bad cholesterol. Moreover, triglycerides, a fatty substance produced in the liver, also found in dairy, meat and cooking oils, found in blood can also contribute to high cholesterol. An increased risk of high triglycerides may be the result of being overweight and eating a diet high in fatty or sugary foods (Labarthe *et al.* 1991). It is evident there is clear physical health risks associated with diabetes, however, the damage does not stop there, rather, it is perhaps the least damaging aspect of the condition.

Psychological and Social Consequences of Childhood Obesity

In modern society, one's outward physical appearance has become a large part of human identity. Indeed, people when describing themselves will often turn to physical descriptions rather than innate character traits (Berscheid 1978). Such importance has only been accentuated in contemporary life as appearances have become supremely important to many younger generations (Hesse-Biber 2008). Outward appearances play a large role in contemporary relationship formation, social status, and serve as a key contributor to one's self-esteem (Margana *et al.* 2019). Moreover, from an introspective point of view, individuals

place a large amount of their self-worth on their appearances and thus, they play a crucial role in their emotional wellbeing (Hoyt and Kogan 2001). Subsequently, the onset of increased levels of obesity in children and adolescents has potentially damaging consequences not only for one's physical health but equally, their emotional and psychological health. The relationship between physical and mental wellbeing is particularly pronounced in youth compared to the comparatively higher value placed on emotional characteristics in later life (Baumrind *et al.* 1994).

Body Self-Consciousness. An increased level of self-consciousness is indicative of an increased risk of one conceptualizing themselves negatively (Simmons *et al.* 1973). Due to the centrality of this trait there is an evident link between how individuals feel about their body and feelings of self-worth and emotional wellbeing (Harter 2000). Indeed, research by Strauss (2000) indicate the increased frequency of overweight children being socially marginalized. They stress how almost no issue experienced throughout childhood and adolescence has as severe an impact on normal development as being overweight. Furthermore, per Monello and Mayer (1963) evidence that obese adolescent girls exhibit frequent demonstrations of expected rejection and are predisposed to progressively withdrawing from typical social situations. Such withdrawal only serves to accentuate potentially pre-existing depressive episodes and lower levels of self-esteem (Strauss 2000).

Supporting data indicates the strong negative social stigma that is now associated with obesity and how overweight children are likely to be described using derogatory terms (Kirkpatrick and Sanders 1978). Specifically, obese children are often designated to be less socially desirable as friends. There is significant consensus on how friendship is an important conduit for normal social and psychological development of children and adolescents (Youniss and Haynie 1992). It is clear then given the huge importance placed on body images and conformity to specific societal norms that being overweight in childhood and adolescence

has long-lasting implications for normative development (Strauss 2000). Indeed, Strauss (2000) further emphasises how social marginalization limits individuals' social network and contributes to fewer meaningful relationships than their average weight peers.

Progressive Shift in Body Standards. Indeed, this problem has only become progressively worse in recent years. Society has continued to push the marker of a woman's personal happiness as closely linked with their physical attractiveness (Hesse-Biber 2008). Failure to align with these ideals can lead to the development of eating disorders or other psychological issues. The prevalence of such standards has also never been higher, with society progressively enshrining a 'thin ideology' through the traditional and contemporary media. Research by Wiseman *et al.* (1992) found that the idealised female body has become increasingly thinner over a two-decade time frame. Likewise, traditional understandings of body image tend towards men not being subject to the same pressure as women, however, some research would indicate this pressure is also felt in contemporary society. Men are more likely to have their body image damaged by failure to attain the muscular ideal that has permeated contemporary media (Cohn and Adler 1992).

Research has shown that attaining such a body standard has a positive relationship on relationship formation and oppositely, failure to do so is linked with a degraded likelihood. Internalization of such a body standard has been witnessed in children as young as 3 and such children were more likely to attribute negative adjectives towards overweight children (Annis *et al.* 2004). A growing anti-fat bias leads to an increased social exclusionary processes and body weight related bullying (Haines and Neumark 2009). Such negative social consequences for overweight individuals have led to an increased cognitive and emotional investment in one's physical appearance from very young ages. This can be better understood when one considers historical trends of body dissatisfaction between heavily weighted towards women (Cash and Henry 1995). Across all age groups, girls and women have reported that an

incongruency between their ideal and current body type has detrimental effects on their emotional wellbeing (Pliner *et al.* 1990). However, this too has become less applicable as increased rates of body dissatisfaction have become evident in modern males also (Grogan 2016).

Body Image and Emotional Wellbeing. Research on the topic is clear, men and women being unsatisfied with their current body shape relative to contemporary standards has detrimental effects on emotional wellbeing, healthy relationship development, and maintaining adequate levels of self-esteem. Indeed, research indicates this effect is also prevalent in children as young as preschool age (Smolak 2004). Body image dissatisfaction to this extent has been linked with depressive episodes and is indicative of a higher co morbidity rate in children who are overweight compared to their peers (Wardle and Cooke 2005). Weight related teasing, and criticism from both parents and other social authority figures at such a young age invariably contributes to such dissatisfaction and a lowered body esteem.

However, notably, it is not the weight directly that creates such personality detriments rather the social factors surrounding them. The prevalence of such factors as poor peer-to-peer relationships, group integration, and friendship formation is significantly lowered for overweight children leading to a large correlation between depression levels and obesity. Indeed, such a process is invariably self-sustaining as rates of depressive episodes are linked with a strong likelihood of increased future weight gain (Wardle and Cooke 2005). Such processes are only becoming increasingly more prominent with the advent of pervasive access to social media.

Potential Solutions: A Positive Conclusion

On Average children spend thirty-five hours a week, nine months a year at school, which makes it a suitable locale for health and dietary interventions (Ilkay and Wallace

2012). This fact was recognised and in 2011 Michelle Obama released the 'Let's move initiative'. This ten-billion-dollar initiative is challenging schools to take a proactive approach to helping children get more active in the run to creating a healthier upcoming generation. Major areas being addressed are a modification of physical education on the school curriculum and a school lunch program which aims to provide children with a nutritious health lunch (Ilkay and Wallace 2012). Leo Varadkar the former Irish Minster for Health launched the first ever physical activity plan for Ireland when the alarming statistic of one in four children are unfit , overweight, or obese coupled with an elevated blood pressure. The initiative 'Get Active' aims to develop a coordinated approach of high-quality physical education in schools which is essential for children to develop lifelong skills and confidence to continue participation in sport and exercise.

Indeed, most interventions aimed at reducing obesity have a school-based component. However, those that are most successful tend towards utilizing the involvement of the parents directly (Lindsay *et al.* 2006). Frequently, the parents only have an outside role and are merely informed, rather than active participants in school-based interventions. However, their importance is supported in research and such family led interventions focus on the needs of the children while coincidingly attempting to improve the outcome for all family members (Lindsay *et al.* 2006). A crucial aspect to ensure effectiveness of such programmes is the appreciation that the family knows that is best for itself, and that such interventions place a strong emphasis on the environmental factors that govern daily lives (Ilkay and Wallace 2012).

Through the utilization of community-based participatory research parents are actively involved in the design, implementation, and knowledge collection alongside more seasoned professionals, allowing them more direct input into outcomes for both themselves and their children (Ilkay and Wallace 2012). Such an approach is effect for gaining a detailed

and individual level understanding of the local socioeconomic factors to ensure interventions are tailored and specific to the environment it needs to take place in. It is vital when undertaking such interventions to gain a broad understanding of what barriers exist in the immediate area to successful interventions, and likewise, facilitators that will accentuate the pre-decided health goals (Davison *et al.* 2013)

A community led approach has many advantages, firstly, parental engagement was 50% higher over the two-year study than other pre-existing methods of engagement (Davison *et al.* 2013). Perhaps, more importantly, parents continued to remain in contact after the cessation of the intervention to continue to provide a meaningful support network for each other and their children during the path to a successful health increase. Finally, such interventions are designed around increasing competence in areas such as nutrition, exercise, and general encouragement. Overall, community led interventions lead to a 10% increase in weight loss compared to other control groups, and such a difference maintains for 18 months after the conclusion of intervention without any need for additional support (Davison *et al.* 2013).

Future Directions in Intervention Research. It would appear that a dualistic approach utilizing the two most important aspects of children's lives, the family and the school as community anchor points and operating targeted interventions would be most effective. However, this remains as put one potential solution to a growing problem. It is important to remember that there are other environmental, corporate, and individual tendencies that must be appreciated to truly advance weight loss as a society in a meaningful direction. Throughout this essay, a detailed examination of what the effects of such factors can have on the physical and psychological wellbeing of obese children. The damage it is doing to their normative social and physical development cannot be understated. The rise in levels of diabetes, cancer, hypertensive related illnesses, and other physical afflictions has the

potential to see health care costs skyrocket and place an undue burden on wider society. Moreover, due to the psychological implications there is a potential that individuals will not live happy and connected lives due to potential social isolation and low self-esteem. However, with enough time and effort through the use of meaningful interventions as listed above one can be hopeful that some change can be made.

Future studies into this area should examine the efficaciousness of these interventions over a more longitudinal time frame while mapping the necessary continued supports that would be required to ensure long-lasting change. Moreover, further work needs to examine the role of interventions outside the school and the home such as targeted social advertising from non-government organisations or companies with a high level of corporate social responsibility (Wu *et al.* 2013). Ultimately, such interventions will be limited in their applicability unless individuals take meaningful control within their own lives. Indeed, given the dependent nature of this children this role rests largely on the authority figures in children's lives. Thus, this author believes future effective intervention should be led mostly through parents and schoolteachers to truly gain an increased amount of control on what has the potential to be one of largest epidemics in human history. However, this author remains hopeful that such interventions if undertaken swiftly can prevent such a scenario and through education about childhood obesity utilizing work such as this that children will no longer be subject to the physical and psychological complications associated with obesity.

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