Obesity Epidemic, Medical and Quality of Life Consequences: A Review

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Abstract

Obesity is excessive body weight that leads to bad health. The scourge of obesity is a serious public health problem that has reached epidemic proportions in both developed and developing countries. The epidemic has to be addressed and given serious attention because of its medical, health, economic and quality of life consequences at local, national and global levels. Besides the high cost of treating obesity or associated diseases, there is loss of work productivity and loss of earning power as well as loss of quality of life in people living with excessive weight gain and obesity. This paper will address the growing obesity epidemic and its various consequences. It will review several published studies as well as some unpublished anecdotal reports on the consequences of obesity in different populations. It is hoped that this review may contribute in raising awareness on the burden of obesity; it may also stimulate interest in weight management and inspire some individuals to take action to control their excessive body weight. In addition, discussion of the consequences may act as a deterrent or wakeup call in those individuals who are complacent and unrestrained in their dietary consumption, or those who feel unconcerned by their excessive body weight. Highlighting the serious consequences of obesity may also ignite the public to take action to curb the epidemic and improve the lives of people living with this chronic disease. The collaborative efforts of government, industry, health professionals, nutritionists as well as affected individuals will help to reduce the obesity epidemic, minimize its consequences and ensure good health and wellness in many populations.

Keywords

Obesity, Epidemic, Consequences, Costs, Medical, Quality of Life, Weight Management, Wellness

1. Introduction

Obesity is excessive accumulation of body fat that leads to failing health, disability, increased morbidity and mortality. A person's weight status is determined to be in the obese range when the person's body mass index (BMI) is 30.0 kg/m$^2$ or higher for most non-Asian populations [1]. The BMI is one of the popular methods used in determining obesity. The BMI is calculated in the metric system as weight in kilogram divided by height in meter squared. In the imperial system, BMI is calculated as weight in pounds divided by height in inches squared and the result is multiplied by a factor, 703, to get the BMI number. The metric and imperial BMI formulae were fully described in previous papers [2], [3]. The BMI can be an outcome measure of obesity as well as an anthropometric predictor of metabolic risk. Some researchers also use waist circumference measurement to estimate obesity; thus obesity is described as waist circumference greater than 35 inches in women or greater than 40 inches in men. There is however some ethnic/racial differences in both the body mass index and waist circumference cut-offs for obesity determination in certain population groups. For example, in Asians, the BMI and waist circumference cut-off for obesity are lower [4], [5].

Obesity is classified as class I or mild obesity(BMI of 30.0 to 34.9 kg/m$^2$), class II or moderate obesity (BMI of 35.0 to 39.9 kg/m$^2$) and class III or extreme obesity (40.0 kg/m$^2$ and above) for most populations. Each class of obesity has several implications on the individual with weight management issues. The excessive body weight in obesity can result into negative impacts on health and quality of life.
including body image. Body image is placed in high priority in the 21st century and affects a person's life in many ways. The negative impacts of obesity are the reasons why many people who are obese or overweight are in serious search of effective ways to enable them to lose weight, get lean, look good and feel healthy.

The trend in obesity and overweight in many US populations is rising at epidemic proportions [6], [7]. The increasing trend in obesity has also been experienced in other parts of the world across all populations and age groups [8]-[10]. Despite many obesity preventive strategies described in various reports [2],[11]-[14], the epidemic of obesity and increasing weight trends continues to rise in segments of populations in developed and developing countries[[15],[16].

The obesity epidemic is a burden because obesity manifests not only as excessive body weight and enlarged shape and size, but it is also accompanied by occurrence of other associated diseases which negatively impact health. Such associated diseases or co-morbidities include diabetes, heart disease, hypertension, high cholesterol, arthritis and other conditions which can become chronic and drain healthcare funds if affected individuals do not get prompt and proper medical treatment[17]. Obesity, overweight and underweight are different forms of unhealthy weight [1] and each individual should endeavor to know his or her formal weight status and also know how to maintain a healthy weight. Obesity is an equal opportunity chronic disease with many health consequences affecting various population groups like children [18]-[20], adolescents [21]-[23], the elderly [24], [25], adult women [26], adult men [27], pregnant women [28]-[30] and post partum women [28], [31].

The general public needs to view seriously the consequences of uncontrolled weight gain and obesity and get adequate help in weight management once diagnosed with unhealthy weight status. This paper will define and classify obesity, and review the published literature on the medical and quality of life consequences. In addition, some anecdotal reports on the consequences of obesity will be discussed. Awareness of these consequences can become a motivator for stimulating interest in weight management; it may encourage people to lose excess weight and improve health and quality of life. These consequences can act as a deterrent for those individuals who are complacent about their dietary consumption; it can also act as a wake-up call in those individuals who feel unconcerned about their high body weight. It is hoped that appropriate interventions will help to reduce the obesity epidemic and its consequences.

### Table 1. General BMI classification by weight status **.

| BMI Class | Weight Status |
|-----------|---------------|
| <18.5     | Underweight   |
| 18.5-24.9 | Normal weight (or Healthy weight) |
| 25.0-29.9 | Overweight    |
| 30.0 -34.9| Obesity Class I (Mild obesity) |
| 35.0-39.9 | Obesity Class II (Moderate obesity) |
| 40.0-40+  | Obesity Class III (Morbid obesity) |

Source: Jensen et al [1] **except for Asians.

### 2. Discussions

#### 2.1. Consequences of Obesity and Overweight

There are different classifications of weight status of an individual based on the person's BMI level (Table 1) and those with obese weight status are further sub-categorized as Obesity Class I, II, or III based on the severity of obesity risk[1]. The rising prevalence of obesity and overweight in many populations are problematic and can lead to various disease states with medical consequences [18]-[31]. High prevalence of obesity may lead to a decreased quality of life which also has negative consequences [32], [33].

##### 2.1.1. Medical & Health Consequences of Excessive Body Weight

Obesity affects various body systems and leads to various conditions that have serious medical consequences that affect individual and public health care. These consequences are also listed in Table 2 and discussed below.

(a) **Cardiovascular Diseases, Diabetes & Insulin Resistance**

Chronic disease states arising from obesity include cardiovascular diseases (CVD), such as coronary heart diseases, heart attack, heart failure, abnormal heart rhythms and stroke [34]-[37]. These cardiovascular diseases can be debilitating and costly if appropriate treatment is delayed, overlooked or if adequate treatment is not promptly given. In addition, obesity can occur concurrently with or lead to diseases or conditions such as diabetes [38], high blood sugar [38],[39] and insulin resistance [40] which can be problematic for individuals living with these conditions.

(b) **High Cholesterol & High Blood Triglyceride**

Obesity can occur concurrently with or lead to disease conditions like abnormal high blood cholesterol including high levels of bad cholesterol (high LDL cholesterol) and high blood triglycerides (high TGs) [41], as well as metabolic syndrome [42] which can be problematic for individuals living with these conditions. In addition, increases in remnant cholesterol or the so called "ugly cholesterol" (non-HDL, non-LDL cholesterol) [43], [44] as well as decreases in good cholesterol (low HDL cholesterol) have been attributed to overweight and obesity according to published reports [43]-[45]. Ugly cholesterol is known to be worse than bad cholesterol as it causes more incidences of atherosclerosis, inflammation and ischemic heart disease. Fortunately ugly cholesterol can be lowered by life style interventions such as weight loss, exercises, as well as use of drugs such as statins and fibrates [44].

(c) **Pregnancy Induced Hypertension, Gestational Diabetes & Complications in Pregnancy and Delivery**

Because of the upward global trend in obesity, many women of child-bearing age are also becoming obese [17]. Obesity is associated with reduced fertility in some of these women [46]. In addition, obesity in pregnant women increases risks of adverse health outcomes especially negative birth outcomes for the mothers and their babies. For
the child, obesity increases the risk of health problems such as preterm birth, small for gestational age & low birth weight babies. It may also lead to lifelong health problems for the child including Type 2 Diabetes, heart disease and childhood obesity, which may progress to adult obesity [47]. For the pregnant woman, excessive amount of maternal weight gain may increase her risk of complications not only during pregnancy but also during labor, delivery and post partum period. Such risks include pregnancy induced hypertension, pre-eclampsia, gestational diabetes and excessive gestational weight gain [48]-[51]. Other risks include macrosomia (having very big babies) [29], [30], birth injury, instrumental and Caesarian deliveries [40], [41]. Some gynecological complications include hemorrhage during labor and/or delivery, post partum bleeding, infections, postpartum weight retention, difficulty with breastfeeding and post partum obesity[47]-[50].

(d) Metabolic Syndrome, Hypertension, Gall Bladder Disease and Urinary Tract Infection:
Conditions like metabolic syndrome [34], [42], as well as high blood pressure [51] have also been implicated in the obesity and overweight epidemic. These diseases are costly, affecting the individuals both functionally, emotionally and financially.

Similarly problems of excessive body weight can also result in increased risk of other chronic diseases like gall bladder disease [52] and urinary tract infections or UTIs [53].

(e) Mental Health Problems Including Depression
In some individuals, obesity has resulted in mental health problems including depression and low self esteem, according to several reports [54]-[56].

(f) Bleeding Problems & Inflammation
Bleeding problems [57], [58] and veno-thrombo-embolism or VTE [59] have been reported in people living with obesity. In addition, some published reports indicate that inflammation is one of the conditions that can result from obesity and overweight [60], [61].

(g) Sleep and Breathing Problems including Asthma
Many people living with obesity and overweight tend to snore during sleep; they struggle to breath and sometimes do not get enough air. Sleep problems [62], asthma [63] and other poor breathing conditions like obstructive sleep apnea [62] - [64], [65] have been attributed to obesity and overweight.

(h) Musculo-skeletal Diseases
Obesity has been implicated in various musculo-skeletal diseases [66]-[68]. Some diseases like rheumatoid arthritis [69] and osteo-arthritis [70] have also been associated with excessive body weight.

(i) Fatty Liver, PCOS & Some Cancers
Some diseases such as fatty liver [71], and non alcoholic fatty liver [72], polycystic ovarian syndrome or PCOS [73]-[75] have been attributed to obesity. In addition, some cancers, such as endometrial, prostate, breast and colon cancers have also been attributed to obesity and overweight [76], [77]. Some studies indicated that certain cancers have been correlated to maternal pre-pregnancy obesity [76]-[78].

(j) Reproductive Problems in Men and Women & Infant Mortality
Some reproductive problems are associated with being obese or overweight in both women and men. Obesity and overweight in women can result in conception and implantation problems [79] while in men, obesity can cause reproductive problems such as reduced sperm count, decreased sperm quality and increased male infertility [80]. Other reproductive problems in women include sexual dysfunction, reproductive complications [81], infertility [46] and Caesarian section problems [81], [82].

Recent studies also indicate that an increased infant mortality is correlated with maternal pre-pregnancy obesity and overweight [83], [84].

| Medical & Health Consequences of Obesity & Overweight | References |
|------------------------------------------------------|------------|
| Cardiovascular Diseases-(coronary heart disease, or CHD, Congestive heart failure or CHF, Heart attack, Stroke, Sudden cardiac arrest, Angina (Chest pain, Abnormal heart rhythm). | [34]-[37] |
| Diabetes & Hyperglycemia, Insulin resistance | [38]-[40] |
| Abnormal blood cholesterol(high LDL, low HDL, remnant cholesterol and high triglycerides) | [43]-[45] |
| High blood triglyceride, dyslipidemia | [34], [41], [42] |
| Metabolic syndrome*** | [34], [42] |
| Pregnancy Induced Hypertension, Gestational diabetes, Pregnancy Complications; Breastfeeding difficulties | [29], [30], [46]-[49]; [50] |
| High blood pressure, Urinary system problems-gall bladder issues, gall stones, incontinence, urinary tract infections | [51] |
| Depression & Some Mental Health Problems | [52]; [53] |
| Bleeding problems Hyper-coagulable state | [54]-[56] |
| Venous Thrombo Embolism in Obese Children | [57], [58] |
| Inflammation | [59] |
| Sleep problems | [60]; [61] |
| Asthma | [62] |
| Other Breathing problems— such as Obstructive Sleep Apnea, Mild sleep apnea Obesity hypoventilation syndrome; Musculo-skeletal problems, Rheumatoid arthritis, Osteoarthritis Fatty liver; Non alcoholic fatty liver Poly Cystic Ovary Syndrome(PCOS) Cancers (of endometrial, prostate, breast, colon) | [64] [65]; [66]-[70]; [71]; [72]; [73]-[75]; [76]-[78] |
| Reproductive Problems: Conception & Implantation problems, Sexual dysfunction, Reproductive | [79]; [80];[81];[46];[80][29], [30], [80], [81] |

Table 2. Medical & Health Consequences of Obesity & Overweight.
2.1.2. Major Quality of Life Consequences

In addition to the aforementioned health & medical consequences, the overall quality of life (QOL) of obese/overweight persons is decreased and some people living with obesity, particularly morbid obesity, experience poor quality of life. These major QOL consequences and accompanying references are listed in Table 3a.

(a) Stigma, Discrimination, Prejudice & Poor School Achievement in Children

Many obese people, including young people and school children, are subjected to prejudice and social stigmatization according to some published reports [18], [85]-[88]. This can lead to high risk of depression, poor self acceptance, poor life satisfaction and low self esteem in some individuals. Children living with obesity have been observed to do poorly in schools [89]. Some children living with obesity always feel nervous and keep focusing on their weight instead of paying attention in class. This is a distraction that can interfere with children’s participation in social and academic activities in school and can consequently affect overall school performance in a negative way.

(b) Weight Bias, Stigma, Weight Discrimination and Poor Body Image

Many people living with obesity, including children, experience weight bias, stigma, weight discrimination and poor body image [33]. According to some published reports, the inclination to form unreasonable judgments based on a person’s weight is known as weight bias, while the social sign that is carried by a person who is a victim of prejudice and weight bias is called stigma [90],[91]. Societies have used weight bias and stigma as ways of shaming and blaming people so that they will become disciplined and motivated enough to lose weight and conform to societal norms of thinness, beauty and good looks. Unfortunately most of the causes of obesity (e.g. genetics, environment) are not caused by the obese victim but by several factors outside the control of the obese or the overweight person. In many places, obese and overweight children are teased in schools or playgrounds because of their weight [91]. This teasing negatively affects children’s self-esteem and feeling of self-worth. Some authors have discussed weight bias extensively [90]-[93]. According to published reports [90], [94], [95], weight bias and stigma affect children and adults in many other ways besides teasing. These other ways include: taunting in the youth across race and ethnic lines, employment related discrimination and work victimization of adults that may also affect children as they grow into adults. Other discriminatory effects of stigma and weight bias include blaming and shaming by peers, teachers and even some parents. In addition, discriminatory attitude of healthcare workers and educators, the media and parents promoting thinness as positive and obesity or overweight as negative has led to feeling of guilt and remorse by the obese children. Salary and wage discrimination by employers have also been reported for the obese especially women [90].

Poor body image and weight discrimination have also been reported in adults [91], [94]). In some parts of the USA, it has been reported that obese people are often perceived as lazy, stupid and lacking will power to control food intake [94]. This negative perception of people living with obesity tends to be translated into verbal and physical assaults, shaming, discrimination and other negative attitudes [94], that can have psychological consequences on the affected individual. Weight discrimination has also been associated with high circulating levels of C-reactive protein (CRP), a well known bio-marker for inflammation and various diseases [96].

(c) Increased Surgical Risk

Some people living with excess weight experience increased surgical risk and surgical complications [35], [81], [82], [97]. This can be both painful and expensive, and sometimes result in problematic side effects [98]-[100].

(d) Poor Hygiene

Some very obese people are not able to adequately perform personal hygiene, grooming, or bending because they could not clean or wash hard-to-reach areas of body or between the fatty folds in their skin and can develop skin infections. This negatively affects their quality of life and level of engagement in physical and social activities [101].

(e) Increased Length of Hospital Stay, High Cost of Drugs, Medical Care & Insurance

The health problems associated with obesity and overweight will result in increased length of hospital stay [102], [103], high medical and insurance costs [103], [104], high drug expenditure [105], other economic burden and health costs [106]-[108].

(f) Loss in Work Hours, Decreased Productivity, Diminished Paycheck

Many obese people who also suffer from obesity comorbidities experience loss in work hours and show decreased work productivity with resultant diminished paycheck [103], [109], [110]. According to some published reports, other hidden costs of obesity include not only medical costs but also productivity costs, transportation cost and costs in human capital [111].

(g) Other Hidden Costs

In addition to loss in income, obese people encounter other costs related to work such as buying custom made clothes and shoes for work or shopping at expensive specialty clothing stores for big and tall people; the clothes/dress sizes

| Medical & Health Consequences of Obesity & Overweight | References |
|------------------------------------------------------|-------------|
| complications, Infertility, in men and women Cesarean section problems, Breastfeeding problems, Infant mortality associated with maternal pre-pregnancy obesity | [82],[81],[82],[50],[83],[84] |

**Metabolic syndrome - occurs when any 3 or more of the following conditions listed below are present: (high waist circumference, high blood pressure(BP) or BP medications(meds), high blood sugar or diabetes meds, high triglycerides(TG) or TG meds, low HDL & high LDL or Cholesterol meds).
of the obese are not available in regular department stores. Some extremely obese people who occupy two seats instead of one seat in a passenger vehicle or in an airplane are sometimes made to pay more for the extra space occupied. [90], [111].

(h) Discomfort and Disability, Mobility Problems & Decreased Physical Endurance

Some obese and overweight people endure discomfort, disability & pain. These problems arise because of the excess body weight which contributes to joint pain, knee and back pain and other problems associated with obesity [27], [112], and [113]. In addition, some people living with obesity experience mobility problems [24], [25], while others have been reported to show decreased physical endurance [19].

(i) Premature Death & Disability

In addition to discomfort and pain, premature death and disability have been reported in some individuals afflicted with excessive body weight [24], [114]-[116].

(j) Victims of Bullying & Fighting

Some obese or overweight children have experienced bullying, taunting, victimization and fighting in the school yard or play grounds, resulting in emotional problems in the victimized persons according to some published reports [118]-[121].

Table 3a. Some Quality of Life (QOL) Consequences of Obesity & Overweight Published in Literature.

| QOL Consequences of Obesity & Overweight | References |
|-----------------------------------------|------------|
| Prejudice, discrimination -social, academic, job stigmatization | [18]; [85-88]; |
| Poor school achievement | [89] |
| Weight Bias, Stigma, shaming & blaming, Negative attitude, negative perception | [33], [90]-[96]; |
| Poor body image and weight discrimination | [91] |
| Increased surgical risk, Caesarian complications; other surgical complications | [35], [81], [82], [81], [97]-[100] |
| Mobility problems | [24]; [25] |
| Decreased physical endurance | [19] |
| Poor hygiene problems | [101] |
| Increased length of hospital stay | [102]; [103] |
| Increased health care and insurance costs(at individual, national, global levels) | [103]; [104] |
| High drug expenditure | [105] |
| Other economic burden and health costs | [106]; [108] |
| Loss of work productivity, Job absenteeism & presenteeism | [104]; [109]; [110] |
| Other hidden costs-productivity, transportation, human capital costs | [111] |
| Low back pain, leg & knee pain, other physical discomfort | [27]; [112]; [113] |
| Premature death & disability | [24]; [61]; [114]-[117] |
| Victims of Bullying & fighting | [118]; [121] |

2.1.3. Major Anecdotal Reports on Quality of Life Consequences of Obesity

An informal interview of gym clients during a nutrition practicum by the author, on perceived or experienced consequences of obesity and overweight, was conducted at a local gym. Client responses disclosed their experiences and the impact which obesity was having on their health and quality of their lives. Such consequences range from changed personal perception of oneself and extra cost of living expenses to some of the public's attitude to the obese especially discrimination and bullying. Affected people said they complain privately to trusted friends and family about their experiences and feel sad because of these negative experiences; some of these experiences have fueled the drive in some obese to lose weight. A few of these anecdotal reports on QOL have been reported in literature, while others are not at all documented in research studies, refereed journals or other publications. Nevertheless, these are real life experiences reported by people affected by obesity and overweight. Some of these anecdotal reports on QOL & health are listed in Table 3b and are presented below, while the rest are presented in Table 3c.

(a) Intense Body Odor Due to Excessive Sweating:

Excessive sweating and wetness of hair in the obese leads to bad smells and sometimes chronic body odor; some obese people avoid putting on makeup because of excessive sweat.

(b) Falls & Injuries, Skin Rashes & Unsightly Marks on Body Surfaces, Feet and Fingers

Because of excessive sweating by the obese, dripping sweat can wet floors, leading to slips, falls and injuries in affected people; these conditions can cause discomfort, serious injuries and sometimes disability. The excessive sweating can also affect the skin in some obese individuals as their inner thighs or knees rub together when they walk; skin touching skin feels itchy & sweaty leading to rashes. Car seat belt buckle makes a mark on the bulging belly; shoe buckles also make marks on swollen feet. Sometimes fat marks are seen on the belly or thighs as striae; in other people, sometimes unsightly varicose veins are observed on legs and feet of the obese.

(c) Needing Assistance to do ADLs, Personal Hygiene & Grooming, Housework & Domestic Chores

Some individuals living with obesity do not have the ability to do some activities of daily living (ADLs); some of them need help from family, friends or paid assistants to do personal care. Others have difficulty doing pedicure, manicure, personal grooming, hygiene & shaving. Many of them have difficulty cleaning or washing hard-to-reach areas of the body. Some are unable to do household chores. This difficulty in doing household chores and errands by people living with obesity leads to outsourcing of these activities to others. Consequently, the privacy and independence of the obese people may be compromised.
(d) Loss of Wedding Bands and Expensive Rings that Do Not Fit on Fat Fingers

Wedding rings do not fit on swollen or fat fingers; the rings may be too tight or may be lost because of not being worn regularly on the ring finger.

(e) Poor Dressing Habits, Shabby Dressing, Shoddy Appearance at Formal Occasions & Embarrassment when Clothes Snap & Tear

Some people living with obesity wear baggy sweat pants or oversized clothes to cover up or hide excess fat even for most social or formal occasions; others wear extra large or over-sized clothes, flowing gowns or wrappers to cover up instead of wearing properly fitted clothes that look formal or professional. Clothes that do not fit properly or easily snap and tear when worn by the obese people cause anger and embarrassment for them. Similarly, ripping under-wears & elastic bands of pants falling apart especially in public places can also cause embarrassment for the obese.

(f) The Obese Report Getting Disgusting Looks, Negative attitudes, Stereotypes & Prejudice from Strangers Because of Their Bodyweight

People living with obesity often get nasty looks and stares from by-standers in public places like parks, gardens, movie theaters and even churches & schools. Looks of disgust and pity from people in restaurants, shopping malls, museums have been experienced by some obese people. Other obese people complain of getting nasty looks from fellow restaurant patrons when they attempt to eat out; this experience forces many obese people to refrain from going to restaurants and would prefer to order take-out foods from the comfort of their homes.

Inadvertent negative attitudes to persons living with excessive weight have been reported by some affected individuals. Sometimes total strangers have asked obese/overweight persons about fast food prices, flavors, tastes or locations of nearest fast food restaurants even when the obese person is from out of town. Having a negative attitude at first sight of obese persons without even speaking to them or knowing them personally is a form of negative stereotyping and prejudice which should be abhorred in all societies.

(g) Tendency to Overeat because of Frequent Orders of Take-out Foods

Some obese individuals say that the prefer to order take-out restaurant foods from home instead of visiting restaurants in the city to avoid scorn or being stared at; however frequent orders of take-out foods can lead to over-eating, creating more problems for the obese.

(h) Uncomfortable Sitting Positions at Tables

Some obese people complain that their bellies usually touch the table when they are seated at restaurant or home dining tables; others say they have to sit on chairs at the edges of tables instead of the middle, to facilitate getting around during meal times.

(i) Erroneous Perception/Assessment of Intellectual, Physical and Behavioral Abilities of the Obese & Hasher judgment of the obese

Some obese people complain of negative attitudes and stereotypes from the public. Erroneous negative perception of the obese and overweight persons has been reported as some of the troubling experiences they encounter frequently. These experiences include being labeled as stupid, unsuccessful, fat, lazy, lacking will power and self-control or lacking self discipline because of their excessive body weight. In addition, some people living with obesity report that other people have been more judgmental and hasher on them because of the obesity problems but not as judgmental on others with alcohol, smoking, chronic disease or substance abuse issues. This saddens people living with obesity.

(j) Exclusion of Some Obese People from Some Hospital Treatments & Surgical Procedures

Some patients living with obese weight status complain that they have been excluded from participation in some medical procedures because the health provider said “patient is deemed too large for machine”, for example the bone scan machine which tests bone density and osteoporosis; some patients report of being told to come back for testing procedure after losing some weight. Similarly, some obese people report that they have been excluded from certain surgeries like total knee replacement surgeries and other elective surgeries until they have lost a certain amount of weight. The reason given for this action was “to ensure successful procedure and better outcomes for the surgeries”, according to some obese people.
climbing stairs or walking short distances is problematic for the obese; frequent knee, hip, back and joint pains due to the excessive bodyweight can be worrisome for the obese. Not being able to lift heavy objects or even carry up a young child makes the obese feel bad.

(b) Inability to Participate in Group Activities & Poor Social Life

Feeling left behind when walking and talking with others in a group and unable to keep pace with others when walking together is annoying for the obese. The obese have to deal with many movement and flexibility issues. In addition, many people living with obesity complain about difficulty in dating or finding and keeping appropriate mates and friends; this leads to poor social life.

(c) Poor Sleep Quality, Snoring and Sleep Apnea

The obese experience snoring when sleeping and some obese people do not have a satisfying and relaxing sleep; others disturb family members and significant others with loud snores during their sleep.

(d) Accidental Breakage of Furniture Especially When Seated on Chairs, Couches & Sofas

Some very obese people report that their heavy body weight has led to accidental breakage of some furniture when they are seated especially on chairs. Such broken furniture have led to falls & injuries in the office, home, public or private settings & consequently the obese person became embarrassed and felt they were a 'laughing stock' of some on-lookers.

(e) Self Esteem Issues & Poor Feeling of Self Worth

Lack of zeal in doing any task, taking leadership roles or taking initiatives leads to low self esteem in people living with obesity. Similarly, feeling bad after looking in the mirror or feeling shameful because of exposed fat are common experiences of obese people. In addition, feeling bad after looking at old profile photos or older photos of self as a slim person compared to current photos of self as a fat person lead to poor feeling of self worth in the obese.

(f) Weight Discrimination, Teasing and Bullying in Children & Adolescents

Constantly experiencing weight discrimination, teasing & bullying can affect obese children's psychological and physical functions, leading to some children dropping out of school. Some anecdotal reports also state that some bullied obese children develop fear of school or a dislike for attending school and some children consequently dropped out of school, while other parents changed schools for their obese children and adolescents to avoid weight based bullying and teasing.

(g) Erroneous Perception of Any Obese Woman as Pregnant (when in actual fact, she is not pregnant)

Some co-passengers in public transportation tend to volunteer their seats to the obese woman in the bus or subway train for fear the bumpy bus or train ride might harm 'her unborn baby'; sometimes strangers in a bus or train touch the belly of an obese non-pregnant woman, asking to know her due date of delivery or expressing their feelings/concern for the current high cost of baby clothes, diapers and baby foods. Such expressions can be embarrassing to a non-pregnant woman.

(h) Alleged Denials of Health Insurance, Promotion in Workplace and Job Offers Some obese people allegedly report being denied health insurance because of their obesity and excessive bodyweights. Other obese people allegedly report being denied promotion or feel they were not given positive recommendation for promotion in the workplace because of the obesity or excessive body weight. Some obese people also allegedly report being denied job offer or feel they were not considered for certain jobs because of their obesity-related problems or excessive body weight. This saddens some people living with obesity.

(i) Extra Cost of Living Expenses for the Obese: On Furniture, Transportation, Personal Care, Clothes, and Household Chores

- Use of Oversized furniture: Using oversized chairs, custom made toilet seats, special bath scales, and large beds to accommodate the large body size leads to extra cost.
- Transportation costs: Similarly paying for double seats instead of single seats in public transportations or airplanes brings an extra cost to living expenses.
- Extra expenditure on skin care: Itchy thighs & skin rashes from excessive sweating leads to spending extra money on deodorants, topical ointments, creams, antiseptic soaps, lotions, powders etc;
- Inability to find suitable clothes or shoes in regular local department stores: Having to order clothes from the internet or from expensive specialty clothing stores for big and tall people is costly. Similarly having to visit tailors for custom made clothes lead to added cost to living expenses for the obese.
- Costly Outsourcing of chores: Difficulty in doing household chores or personal care leads to costly outsourcing of duties to others, thereby compromising the person's independence and privacy and an added cost to living expenses.

Table 3c. Other Anecdotal Reports on Health & Quality of Life Consequences (As Experienced by People Living with Obesity & Overweight).

| Description                                                                 | Consequences                                                                                     |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| (a) Frequent Exhaustion, Overheating and Pain from Physical Activity:      |                                                                                                 |
| (b) Inability to Participate in Group Activities                           |                                                                                                 |
| (c) Poor Social Life:                                                      |                                                                                                 |
| (d) Poor Sleep Quality, Snoring and Sleep Apnea                            |                                                                                                 |
| (e) Accidental Breakage of Furniture especially when Seated on Chairs,    |                                                                                                 |
| (f) Self-esteem Issues & Poor Feeling of Self Worth                        |                                                                                                 |
| (g) Weight Discrimination, Teasing and Bullying in Children & Adolescents: |                                                                                                 |
| (h) Alleged Denial of Health Insurance, Promotion in Workplace and Job     |                                                                                                 |
| Offers to the Obese                                                       |                                                                                                 |
| (i) Extra Cost of Living Expenses for the Obese: On Furniture,             |                                                                                                 |
| Transportation, Personal Care, Clothes, and Household Chores              |                                                                                                 |

3. Action Needed to Combat Obesity
& Its Consequences

The consequences of obesity and overweight have prompted not only government agencies, but also professional organizations, non-governmental organizations (NGOs), as well as for-profit and non-profit organizations and foundations, to take action in raising awareness and reaching out to the general public to curtail the obesity and overweight trends. These organizations include among others the Academy of Nutrition & Dietetics (www.eatright.org), the American Heart Association or AHA (www.heart.org), the American Diabetic Association (www.diabetes.org), some charitable organizations and foundations like the Young Men’s Christian Association (YMCA).

Recent reports [7], [17],[22] have stated that the percent of US adults aged 20 years and above who are obese was 35.1 % between 2011 & 2012, while the percent of US adults in the same age group who had excess body weight (overweight and obesity) in the same period was 69.0%. This increasing trend in obesity and overweight has also been reported in other developed [8]-[10] and developing countries of the world [8], [16], [9]. The obesity trends have various causes as discussed in previous papers and are assessed in different ways [2], [122]. A better understanding of the causes and consequences of obesity, its prevention and treatment strategies will lead to a concerted action to fight the obesity epidemic.

4. Conclusion

Obesity epidemic has affected many countries and is still trending upwards at an alarming rate. The rising trend has been observed across many population and age groups including the elderly, the youth, children, adults, men, adolescents and women of child bearing age. The medical and quality of life consequences of obesity are many and obesity is a serious burden on population health [123]. Even anecdotal reports of obesity’s consequences are common and have been echoed by people living with obesity. Many people are concerned about the negative consequences of obesity on health and social life. This review can help raise awareness on the health and quality of life consequences of obesity. Raising awareness on these consequences can stimulate further interest in prevention and treatment of obesity. It may also motivate and encourage people to lose excess weight so as to improve their health and quality of life. Public health education, open discussion and awareness of the negative impacts of obesity can act as a deterrent and/or a wake-up call for those individuals who are currently complacent about their dietary caloric consumption and their excess body weight. Raising awareness may also spur the public into action. Appropriate interventions and collaborative efforts of individuals, health professionals, industry and government will help to reduce the obesity epidemic and its consequences.

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