



Promotion Material on Addressing
Overweight and Obesity as
Emerging Health Concerns Among
Civil Aviation Personnel in the
Republic of Albania

Introduction

Overweight/Obesity are essentially synonyms of excessive accumulation of fat in the human body.

Today it represents a rising global problem in modern way of living, consequentially leading gradually to impairment of wide range of natural anatomical structures of our organs, which inevitably leads (sooner or later) to functional impairment of affected organs by this condition as well (although some organs/systems are more susceptible/prone to be more affected than others, none of them is spared by damaging effects of overweight/obesity) and non-physical (mental health) impact as well.

Overweight and Obesity are commonly called 21st century epidemic conditions, because of their global reach (particularly among economically active population) and their continuously increasing tendency among worldwide population, namely young age population.

These conditions are at the same time acting worldwide as huge pressures on already overstretched health systems of the states, because of significant financial, economic and social impact/burden they are creating in the working sector.

Available data on global level confirm that number of overweight/obese people in some states is tripling in 2016, compared to 1980's and this trend continues to grow even more in recent period.

The data available in US in 2013 show that about 33.3 % of population is overweight and 33 % are obese.

Although comparative data are not available in the Republic of Albania the trend is considered the same in our country as well.

Aviation industry is not an exemption regarding proportion of overweight/obesity among members of this economic sector.

If not treated, overweight/obesity can impose direct safety hazard/concern, affecting long-term wellbeing and overall health of members of professional cabin crew, including flight crew and air traffic controllers, that ultimately may lead to subtle or even acute in flight and/or on duty incapacitation.

Apart of their organic and non-organic effects, these conditions have huge ramifications in psycho-social state of affected individuals (low self-esteem, predisposition to depression and other psychiatric/psychological disorders).

Since proportion of obesity/overweight conditions is considerably high (32 reported cases out of 114 in total) among civil aviation personnel in general and particularly among air traffic controllers of ALBCONTROL, special attention shall be given to this aspect of potential long-term impairment of health condition and negative impact on aero-medical certification.

Overweight/obesity are particularly important, because, if not timely treated, they have direct impact on all systems of organs and represents known risk factors for development of various diseases (arterial hypertension, coronary heart disease, heart attack, diabetes, cancer, gastro-intestinal disorders, depression etc.).

Definition and overview

Overweight which progress to Obesity represent a pathology with complex combined and intertwined influence of external and internal factors on an individual, which leads to accumulation of excess amounts of energy (namely in the form of accumulation of excessive amount of fat) that is not mobilized in balance with its accumulation, (so there is a net surplus of accumulation of energy). This energy is deposited in form of lipid compounds within cells/tissues of the body.

Two main factors that affect overweight/obesity are:

1. Genetic predisposition and
2. Environmental factors.

Additional influence on individuals weight gain can play some medical conditions (thyroid disorders) and use of certain pharmacological agents (steroids), who can influence specific distribution of fats in the body, although these are more infrequent factors, compared to influence of genetically predisposition and environmental factors.

The main casual factors that are responsible for excessive body fat accumulation - adiposity are:

- ✓ food with high energy density available
- ✓ increasing use of such food
- ✓ environmental factors
- ✓ sedentary lifestyle
- ✓ social factors
- ✓ impaired circadian rhythm
- ✓ impaired sleep architecture
- ✓ genetic factors

As per World Health Organization (WHO) definition of overweight/obesity is prescribed as an '***abnormal or excessive fat accumulation that may impair health***'.

Two main numerical factors that could help treating and stratifying risk for development of pathological conditions, due to overweight/obesity are Body Mass Index (BMI) and Waist Hip Circumference Ratio (WHR)

- a) **Body Mass Index (BMI) which represent ratio of your weight in kg and your height in centimeters (cm) and can be subdivided in the following categories:**

A1) 18.5–24.9 (healthy/ideal weight);

A2) 25–29.9 (Overweight 1);

A3) 30–34.9 (Obesity 1);

A4) 35–39.9 (Obesity 2);

A5) 40 or more (Obesity 3)

Although helpful, BMI has some shortcomings, especially among people with high variation on height ('too small and too tall' people).

At the same time BMI does not focus on specific distribution of fat in different body regions and on report between distribution of fat deposition and body muscle mass.

Therefore, in this context a new parameter comes into play.

- b) Waist circumference/Hip circumference (WHP ratio) is a parameter which reflects specific anatomical fat distribution and is very important factor in relation to possible healthy-risks in conjunction with overweight/obesity.**

WHP depending on specific distribution of fat accumulation in individual can be typically categorized:

1. When WHR > 0,85 it is named as “apple shaped” or android (visceral fats deposits on upper parts of the body, namely belly/waist), typically among men and
2. When WHR < 0,85 it is named “pear shaped” or gynoid, typically among women (deposits at thighs and bottom) which are less metabolically active.

Associated health risks related to overweight/obesity

There are numerous associated health risks that can arise from overweight/obesity, since this is a systemic condition which has reflection on wide range of organs and may show chain causing effects on different organic systems, causing health risks of variable severity (high, medium and low level health risks) , as follows:

1. Cardiovascular system (coronary heart disease, heart attack, hypertension, stroke);
2. Diabetes type 2 and insulin resistance;
3. Dyslipidemia
4. Breathlessness;
5. Obstructive Sleep Apnea (OSA);
6. Gall bladder stones formation;
7. Osteoarthritis;
8. Hyperuricemia (Gout);
9. Psychological Factors;
10. Some forms of cancers (colorectal cancer, cancer of uterus etc.);
11. Impaired fertility;
12. Polycystic ovary disease;
13. Low back pain;

All presented health risks are differently expressed in different individuals, but the outmost health risk factors on the aero-medical certification context/perspective represent diseases of cardiovascular system, because of their high potential of acute incapacitation, (hence all the aforementioned pathologies coronary heart disease, stroke, thromboembolism) while exercising privileges of licenses - pilots or flight controllers.

Treatment options

Obesity represents a complex condition/disease which requires systemic multidisciplinary approach, because this is a long-term battle that should be fought consistently and continuously, while gains/results from affected individuals are seen gradually and their maintenance is not an easy task at all.

Before immersing on specific options tackling overweight/obesity it is very important to focus on unique context of development of these conditions among different members of civil aviation personnel.

In this sense the comprehensive approach can be focused on the following topics related to overweight/obesity:

- ✓ Are the overweight/obese signs/symptoms something that has a long-lasting pattern (spanning from early adulthood) or;
- ✓ Are the overweight/obese signs/symptoms appearing acutely and related to recent changes in life-style (cessation of smoking, commencing use of new medication – contraceptive pills) or there are different stressors that could play role on excessive weight gains (job loss, change of social status etc.)

Answers provided will pave the way for different approach/measures on treating overweight/obesity. Long lasting obesity requires long term treatment, which on other hand demand more stringent commitment and discipline by the individuals.

Recent overweight/obesity signs/symptoms that can be attributed to effects of pharmacological agents and/or other psycho-social changes, may be treated more efficiently.

Available options for overweight/obesity treatment can be categorized in three different fields:

a) Modifying life style and diet;

Behavioral measures are most effective, but the most challenging ones to follow, in order to achieve desirable goals on body weight reduction (BMI up to 24.9). Remember that this behavior is deep rooted on daily routine activities and in a way represents long-term established character patterns of individuals concerned.

- ✓ Measures which affect life style changes and new diet regime, inter-alia include, but not limited to:
- ✓ Engage in regular physical activities (150 min/week moderate activity and/or 75 min/week intensive activity;
- ✓ Read food labels;
- ✓ Exercise your routine working in ergonomically natural position;
- ✓ When lifting objects/weights keep your back straight;
- ✓ Build up gradually intensity of physical activity during recreational & sportive activities;
- ✓ Maintain weight through balanced and healthy food/diet with right proportion of high content in fibers and low content in ultra-processed food;
- ✓ Quit smoking;
- ✓ Take food with appropriate calories;
- ✓ Minimize food intake of portions rich on refined sugars (energy drinks, cakes, ice cream etc.);
- ✓ Eat foods rich on fibers and combination of whole grains, nuts, legumes, fresh fruits & vegetables;
- ✓ Reduce salt intake to about 5 gr./day;

- ✓ Set your drink limits;
- ✓ Have several free alcohol days within a week;
- ✓ Inform about alcohol percentage in various alcoholic drinks;
- ✓ Don't binge drink, spread drinking within several days;
- ✓ Decrease as much as possible short-term effects of alcohol drinking-don't drink on empty stomach;

b) *Pharmacological options;*

Pharmacology treatment of obesity, although present through disposal of several drugs with various mechanisms of action, vast majority of them are not compatible with safety-critical duties in aviation environment (piloting and flight control tasks/duties), due to significant and adverse side-effects, unacceptable for aviation professionals.

The most important drugs for the treatment of obesity are:

1. Phentermine; (sympathomimetic agent);
2. Orlistat (Gastrointestinal lipase inhibitor);
3. Liraglutide (glucagon like peptide) and
4. Topiramine (anticonvulsant);

The most adverse side effects of these drugs include:

1. Gastrointestinal disturbances (flatulence, leaky stools, gastro-intestinal irritation);
2. Insomnia (sleep deprivation);
3. Arterial hypertension, palpitations and ECG changes, including cardiac arrhythmias;
4. Hypoglycemia (especially inconvenient for users of sulphonyl-urea);
5. Delusional symptoms, suicidal thoughts and acute angle glaucoma, causing serious visual impairment in the cockpit/radar of flight control tower;

Having in mind adverse side effects of the pharmacological agents mentioned, Orlistat is the only one that may be considered, if other measures have fallen short to give any desirable effect on weight loss. But even in this case, temporarily unfitness is obligatory (due to potential gastrointestinal problems that can occur) in order to monitor for a certain time - period any side effect on gastrointestinal tract.

c) *Surgical treatment of obesity*

There are different surgical techniques available for treating obesity, who can be considered among people with severe obesity (BMI < 40), or people with underlying diseases (diabetes) and BMI less than 40.

Surgical treatment should be taken in account, if other conventional measures (modifying life style or treatment by pharmacology agents) show no improvement in lowering excessive body weight.

Surgical techniques used for treating of obesity are:

1. Roux-en-Y gastric bypass (RYGB);
2. one-anastomosis gastric bypass (OAGB);
3. laparoscopic sleeve gastrectomy;

Although the described techniques have shown good results on short-term weight loss (patients undergone the surgery were followed-up for two years) there are still no available studies for long term effects of surgery interventions.

Several complications of the interventions has been reported (gastrointestinal post-operative bleeding, post-operative infections, hypoglycemic hyperinsulinemia, chronic anemia, vitamin B12 and thiamine deficiency). These conditions can potentially damage long-term prospects of aero-medical certification of civil aviation personnel.

Recommendations

Since the number of overweight/obese cases extracted from medical records of civil aviation personnel in Republic of Albania (namely air traffic controllers) reflects the ongoing global trend in this field, the interventions on life-style and diet are initial steps recommended to be taken in effort to manage and better modify inconvenient trends, regarding overweight/obesity among air traffic controllers of 'ALBCONTROL'.

The recommendations toward employer consist on:

1. Installation of facilities/instruments in appropriate working space which can be used regularly for moderate physical and social activities of controllers (treadmills, static bicycles, table-tennis equipment etc.);
2. Installing kitchen with food/drinks that are calorie – friendly for consumption;
3. Organizing socially connecting events among controllers with retreats to touristic attractions (sea & mountain trips, walking or recreational and sportive activities);

Conclusions

If not managed properly, Overweight lead to obesity and if the latter is not timely tackled, can lead to several health complications, spanning from moderate decline of health parameters, to serious complications with potential of acute in flight/desk incapacitation, resulting to potential events of catastrophic consequences in aviation.

Obesity is a complex problem, requiring complex multidisciplinary approach and ongoing lifelong efforts. The positive outcome of this disease cannot be reached without comprehensive approach, not just from medical professionals, but from other members/stakeholders of aviation industry, including but not limited to; association of aviation professionals (Aviation Pilot Unions, Unions of Flight Controllers, airlines, air navigation service providers etc.) and all members of society as well.

