

Obesity, psychosocial representations and stigmatization, physiopathological consequences : diagnostic and accommodation via physical and sport activities

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Abstract

Obesity has become a worldwide epidemic as far as the developed countries are concerned, as well as the majority of the developing countries, where the consequences are more serious due to the quality of care and the amputated healthy accommodation. Many organizations have been alarmed as to undertake an immediate action aiming at hindering this epidemic via the elaboration of strategies for both fighting and prevention so as to stop its emergence. This article aims to highlight the repercussions of obesity on psychosocial representations resulting from stigmatization, discrimination, social inequalities and even exclusion and rejection of the individual; and on the genesis of the various pathologies as well as the increase in morbidity and mortality associated with it. It also highlights the effect of a sedentary lifestyle and the importance of physical activity to prevent and fight against overweight and obesity, and therefore, prevent the various complications associated with it; to finish with the main recommendations to achieve it.

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I. Introduction

Nowadays, obesity has become a worldly epidemic affecting both children and adults. It is a matter of a chronic disorder associated with several comorbidities. It represents a public health problem at a world scale for it does not only affect industrialized countries, but the majority of the developing ones as well, where its consequences are more serious because of the bad quality of the provided care and the health care often amputated if compared with developed countries. In Algeria, we estimate the proportion of overweight and obesity at 24,9% and abdominal obesity at 20,8% (Belounis, Ait Amar, Hamzaoui; 2019). The mobilization of health services and the cost of the associated medical care have considerably increased and still continue to increase (Poirier and al., 2006). It is an illness, as it was defined by the World Health Organization (WHO), that is characterized by «*an abnormal or excessive accumulation of fat that could harm health*», since it affects the different systems physiology and contributes to the genesis of different pathologies such as the cardio-vascular diseases type 2 diabetes, high blood pressure, some cancers with respiratory diseases...etc.

Because of the dizzying increase of obesity prevalence, many organizations have sounded the alarm, to undertake an action aiming at braking this epidemic, via the conception and the elaboration of different approaches and strategies for both the management and the treatment of obesity (Klein and al., 2004) and ideally prevent and stop its emergence seeing the frequency of its treatment failure (Fogelholm and Kukkonen-Hajula, 2000). One of the key strategies was to produce a major increase in the participation in sport and physical activities for their advantages upon both health and the reduction of the rising costs of sedentarity (Fox and Hillsdon, 2007).

This article aims at underlining the relationship between sedentarity and obesity development as well as the strategies and the intervention modalities with the use of different sport and physical activities in order to prevent from and fight against overweight and obesity, and thus, prevent the different complications related to it. To achieve this, several points were addressed namely the consequences and the effects of obesity, the means and methods of diagnosis and of classification and its physiopathology concerning the principal mechanisms included in the obesity genesis.

Obesity, psycho-social representations and stigmatization

In addition to health matters, obesity is also related to appearance problems which vary greatly between the social groups, a fact that has direct consequences on social inequalities (De Saint Pol, 2013). The body and its

forms represent a field of a social distinction that gives a glimpse about the person's status in society (De Saint Pol, 2013). We find in a given society a cultural vision with an idea about the ideal body model which does not imply being slim but rather having the good large size and being overweight, with a positive evaluation, and which will be a symbol of good health, richness, prosperity and well-being, unlike slim, that is, synonymous with poverty. It has been shown, through sociological investigations, that this interests women more than men within the same socio-economic class (Poulain, 2002). While this characterizes the socio-cultural classes of the common people compared with the more privileged ones. The latter who must have engaged in preventive programs, respect the hygiene conditions as well as the dietetic rules. However, a new category of a higher social class presents an excess of weight as a result of the rise of the energetic needs, for these people regard food as a well-being and a pleasure means against psychological aggressions (Khzami, Selmaoui, Agorram, 2015) with socialized food portions, and without caring about prevention in all its energetic dimensions, social and affective. We also find the overconsumption of dietetically inadvisable products by families who consider it as a sign of both modernity and a social success as well (Corbeau, 2005). One has to know that the food portions are not decisions taken individually but the outcome of a series of social circumstances and constraints (Poulain, 2004).

The body and its forms influence individuals, their daily life, their relationships and their professional carrier as well. The status of an obese person creates phenomena of discreditation and stigmatization that would certainly have an impact over the social mobility (Poulain, 2004) which is more significant when obesity appears since a younger age. In the case of a younger obese, the discrimination is discernible via inappropriate agitations, a feeling of rejection and exclusion by others. The outcomes of obesity are mainly psycho-social (Puhl and Lanter, 2007) through negative behaviors towards obese persons by affecting their social orientations or even provoking a social handicap (Poulain, 2004). Obese persons are often socially alienated, victims of depression, isolation and self-underestimation. Once adults, segregation is particularly seen as far as their professional carrier is concerned. We notice that obese men often reach an inferior social class compared with other men (De Saint Pol, 2013) and get less promotions. This discrimination may become a vicious cycle if the obese person accepts and sometimes justifies the prejudice and the discrimination-based-attitudes

and adopts a character of self-underestimation and a change as far as self-image is concerned. (Poulain, 2009)

The preventive policy against obesity has to take into account the social factor, its surrounding, its history and both the socio-cultural and the psychological complexities through a real multi-disciplinary approach. (Corbeau, 2005). One must shed light on the construction process of the social differences as well as the stereotypes, of which, these persons are victims. The fight against stigmatization has to go through a fight policy against discrimination and the means of devaluing obese persons, to suggest a support and to help them better cope with obesity so as to break the vicious cycle. According to Sobal (1991), the intervention goes by the knowledge and the identification of the stigmatization mechanisms and those of devaluing so as to hinder them, the anticipation of their effects in different social contexts, the assumption of the stigmatization via different psychological behaviors and behavioral techniques, and at last, seeking to interfere at the level of society against stigmatization through communication, sensitization and back up actions.

Pathological Outcomes: Why Talking about Obesity?

Obesity is linked to a rise of the morbidity risk such as the cardiovascular diseases, diabetes type 2, arterial hypertension, some cancers and sleeping disorders, of morality as well as a decrease of life quality (Poirier and al., 2006). The healthy accommodation and the medical services costs, associated with obesity and its diseases, have increased significantly and still increase. We report a change of the metabolic profile within persons having an accumulation of adipose tissues in excess with adaptations and changes of both heart function and structure (Poirier and al., 2006). Obesity affects the heart and represents an independent risk factor for cardiovascular diseases (Poirier and Eckel, 2002; 2000) due to its influence over the other risk factors, already defined, such as dyslipidemics, arterial hypertension, glucose intolerance and diabetes, inflammation markers, obstructive sleep apnea, and hypoventilation...etc. As a result, it paves the way to numerous heart complications such as the coronary disease, the heart failure and the sudden cardiac death (Poirier and al., 2006). Assaban, Mahrous and Aramadi (2015) also report an alteration of the kinesthetic perception among fat students who cannot perform the physical exercises easily.

Obesity Diagnostic

Several methods have been validated to either measure or estimate the body composition, and thus obesity, going from the simplest, accessible for all, to the most complex one, necessitating the use of a high technology and a certain operator competence.

Among these methods, the measurement and the calculation of the Body Mass Index (expressed by the link between the weight and the height) represents both an easy and an accessible way, which is useful and important for the mass epidemiological studies. This method allows to determine the weight excess degree and to establish a rating into normal weight, overweight, obesity and massive or morbid obesity. The Body Mass Index plays a decisive role in the variation of the body weight via its influence over the will and the pertinence to practice a physical and a sports activity or a leisure one. Petersen and al. (2004) indicate that the risk of becoming sedentary after 10 years increases as the Body Mass Index increases. They report an inverse relationship by suggesting that a high value of the BMI induces weaker levels of physical activity later on. However, the limitation of this method lies in the accuracy lack regarding the tissues nature that causes a weight excess that may be the fatty tissue, as well as the distribution and the detection of greasy substances. The place of the fat accumulation, particularly abdominal, has a proportional relationship with the comorbidity risk and represents a risk factor for the cardiovascular pathologies (Poirier and al., 2006), from which the interest to measure the waist circumference. Cornier and al. (2002) indicate that abdominal obesity evaluated by waist circumference is associated with an increase of the health expenses and that the waist circumference represents a better health indicator when compared with the Body Mass Index.

We define two kinds of obesity: android and gynoid, that may be objective to the waist circumference measurement. This latter represents a complement to the Body Mass Index. Besides, the android obesity is defined by an increasing waist size, and consequently, it majors the comorbidity risk, unlike gynoid obesity, characterized by a normal waist size with an accumulation of fat under the waist, and so, does not major the morbidity risk.

It is noted that the waist circumference measurement has to follow a rigorous approach so as to have an accurate measurement and avoid both under-estimation and over-estimation errors. It must be carried out via a standing position, knees slightly separated with normal expiry. The braid

must be perfectly placed horizontally around the waist by keeping it firmly but without compressing the skin.

The skinfold method represents a diagnostic tool that allows to estimate the total as well as the deep greasy component of the body. It is a simply realizable method with a low cost. It allows to estimate the fat mass through the measurement of the skinfolds in different points of the body whose amount introduced in its predictable equations, through the use of a special caliber vice grip. However, it represents some drawbacks such as the difficulty to measure the skinfolds for a patient attained with a morbid obesity. It does not well estimate the deep fatty tissue and tends to underestimate the visceral obesity and the intra-abdominal obesity which plays a crucial role in the cardiovascular diseases.

Impedancemetry or bio-impedance represent a widely used method to estimate both the body mass and composition. It is a simple technique, easy to use, quick, does not need cooperation from the study subject person and non- invasive. This technique has been made valid in relation with a reference method that is biphotonic absorptiometry, and possesses a good repetitiveness (LeGallais and Millet, 2007). Impedancemetry is an indirect method based on the measuring of the biological tissues conductivity (Le Gallais and Millet, 2007). It provides more representative and more reliable results than other techniques depending on the individual's technicity. The physical principle of bioimpedance is based upon the content of different liquid tissues. Moreover, the electrical current, generated by the system, flows into the body and easily penetrates the muscular tissues, unlike the fatty tissues, that present a higher impedance. This impedance difference, which represents the resistance degree of the current body compartments, allows the identification of the tissues as well as the quantification of the different muscular components, fatty, hydric and mineral.

The DEXA (Dual x-ray absorptiometry) or biphotonic absorptiometry is a reference method that aims to study the body composition, and which, allows the separation of three compartments fatty, thin and mineral content with a great accuracy through the scanning of the whole body, with a two-level-energy X-Ray beam whose mitigation functions together with the composition of the penetrated substance. Besides, it allows a reliable record of low-amplitude variations within these components. The drawback of this method lies in its high cost, the lack of accessibility and indispensability for the patients with a mass obesity, in addition to the fact that it does not distinguish between the visceral fat mass and the subcutaneous one.

There are other methods for both the measuring and the estimating of the body composition but whose use is scarce such as the body density measurement, the measurement of the total water and the computerized tomodensitometry, the Nuclear Magnetic Resonance NMR, ...

Physiopathology: installation of obesity.

The factors, which influence the installation of obesity, are grouped into two main categories, from the one hand, we find the genetic susceptibility of certain persons to develop an overweight reaching the morbid obesity. This susceptibility represents a non-altered factor, but that may be managed to brake its expression and this by adopting a very active lifestyle that favors the risk decrease (Rampersand and al., 2008). The other category, on the other hand, represented by both the behavioral and the environmental factors, which are of a capital importance for the genesis and accommodation of obesity. We also find, particularly, the food behavior disorder and sedentarity. The weight gains result in a balance rupture between the total amount of calories coming mainly from food, and the basal energy expenses as well as the supra-basal ones. However, there is a big individual variability in the android obesity development that may be due to a malfunction of the hypothalamo-pituitary axis with an alteration of the hormone growth production and of sexual hormones and cortisol. This central component is linked with and influenced by certain environmental factors such as the psychological stress level, psychological situation, social relationships...etc.

Importance of the physical activity in the obesity accommodation

Obesity, inactivity and physical and sports activity

During the last years, several studies have reported a significant decrease concerning home and physical activity, and the covered distance through walking or on bike (Department for Transport. National Travel Survey, 2004) together with an increase of the rest free time (Office for National Statistics, UK Time Use Survey, 2005) and the use of the means of transport mainly cars. (Department for Transport. National Travel Survey, 2004). According to the thermo-dynamic law on the energetic balance equation, Stubbs and al. (2002) report that a change in the physical activity can induce a weight change if the energetic needs are not counter-balanced by the energetic expense change. We attend a significant change in lifestyle with a labor transfer for the tertiary sector of services (International Labour

Organisation, 2006) and thus resulting in the proportion decrease of people engaged in handy jobs and creating a decrease in the daily energetic needs expenses which had become less than the advised ones (Hayes and al., 2005). We hereby, mention the food diet with a negative energy balance, pharmacotherapy, surgery...etc. However, the physical activity together with a food rebalancing, represent the most important component of all therapies.

Although the various observations in the anterior studies about the relationship between the physical activity and obesity had been flimsy and ambiguous. The physical and the sport activities has been considered as one of the most important strategies to counter and prevent overweight and obesity (Erllichman and al., 2002; Saris and al., 2003) whatever the gender is (Fogelholm and Kukkonen-Hajula, 2000) or mainly regarding women (Owens and al., 1992). The main purpose of this strategy is to avoid the sedentary lifestyle (Petersen and al., 2004) and to favor a major increase regarding the involvement in physical and sport activities, due to their beneficial effects upon health, morbidity and mortality (Petersen and al., 2004) and the decrease of the costs resulting from sedentarity. The increase of the physical practice precociously in life represents the most efficient method to fight obesity (Mitchell and al., 2002). The principal fields of the physical activity that contribute to the decrease of the incidence and the obesity prevalence are mainly the physical and sport activities as well as the recreational physical activity, in addition to the heavy physical activity housewife and the kinetics Travel and Transportation physical activity (Fox and Hillsdon, 2007). The increase of these activities practice might well be an important means that compensates the daily weak energetic cost. (Fox and Hillsdon, 2007).

Recent studies have underlined the importance of the quantitative aspect of the relationship between the physical activity and the weight gain risk or obesity and had concluded that it was necessary to reach a given sport practice level that had to increase the energetic cost from 1.7 to 1.8 times the value of the basic metabolism (Erllichman and al., 2002; Saris and al, 2003). Petersen and al. (2004) indicate in an epidemiological study that the obesity Odds Ratio for the active subjects corresponded to half of the ones who are less active with a significant difference.

The physical and sport activities play a crucial role concerning the prevention and the accommodation of obesity. It interferes in many fields like the energetic cost, which can overpass the rest basal values, in addition to the food portions watch. We also watch some positive effects of the

physical activity psychologically speaking, and that mainly concerns the humor regulation, the well-being feeling and the self-esteem. The latter favor the limitation of the weight gain and the observance of dietetic pieces of advice.

The sport and physical activity intervene in the regulation of appetite through the energetic cost. That is why, it had been reported that when the energetic cost decreases, the appetite regulation depends on some extrinsic factors such the availability of food and the need for satisfaction, and thus the weight gain is easily carried out. However, when the energetic cost rises up, the appetite regulation is carried out according to the real needs (intrinsic factors). This is at the origin of the reduced risk of the overweight and of the altering of the hedonist response to food.

The physical activity has a good effect on health. It provokes a decrease of the lipidic troubles that often accomand obesity and the overweight. It has been borne out that there is a dose-response relationship between the physical activity and the lipidic profile, and mainly as far as triglycerides and HDL cholesterol are concerned. This finding is more significant when the energetic cost is above 2000 kcal/week.

The interest given to the physical activity regarding the fight against obesity is due to its continuous effect upon the energetic cost. Surely, The energetic cost increases significantly during a physical activity session. Yet, this increase of cost persists even up to 12 to 15 hours after a session, and the comeback of the metabolism to its rest value is achievable only after 24 to 48 hours (De MelloMeirelles and Chagas Gomes, 2004 ; Thornton and Potteiger, 2002), a fact that leads to another session so as to re-increase the energetic cost again . This is the principal of the sport practice regularity. Several types of the physical and sport activities, according to their intensity, can be used in accordance with the practitioner's profile. One can mention the week intensity of physical activity, limited to 60% of the theoretical maximum heart rate (calculated through many methods whose simplest is $MHR_{th} = 220 - age$). Saris and al. (2003) report that the secondary prevention of the weight gain among previously obese people necessitates from 60 to 90 minutes of moderate physical activity, this duration that decreases if the intensity increases. However, the primary prevention from the weight gain is assured via a single physical activity of a moderate intensity of 45 to 60 minutes a day. The high intensity physical activity or the excessive physical activity, with a high intensity and pauses, favors the consumption of fats while resting (Yoschioka and al., 2001). However, the

last alternative to the sport practice remains the fast walk, which, though not of a significant intensity, would be very beneficial to health.

Recommendations for the Fight against Obesity and the Promotion of Health via the Sport and Physical Activities

The sport investment, the sport facilities and infrastructure should be regarded as the authorities' strategy in order to increase the public sport and physical activities practice and to promote health (Fox and Hillsdon, 2007), so as to reach appreciable levels. It is urged to increase the number of people engaged in a regular physical activity until reaching a maximum of individuals who should be active at a rate of 30 minutes of a moderate activity with a frequency of 5 times a week. The exploitation of the sport facilities, particularly the school ones which have witnessed an important development the last years, should evolve and not remain static as noticed. It must not be limited to the minimum time devoted to the physical activity in the school syllabus and the facilities must be more accessible for extra activities. The private sport facilities, hugely developing lately, the awareness of the efficiency of the physical activity programs that had led to the building of sports halls in certain factories and production companies represent factors that contribute to the energetic cost increase and to counter sedentarity and the time spent in inactivity and fight its shortcomings.

The fight against obesity and the promotion of health go also by the public awareness of the advantages of the fact of adopting an active lifestyle such as the decrease of the means of transport use and their substitution by active means of transport like the march and bicycles. It is crucial to stick to the consensual opinion of the public health and to advocate a moderate intensity activity of 45 to 60 minutes per day (Wareham and al., 2005).

Finally, due to the heart work increase as far as obese persons are concerned as previously seen, it is important to underline the interest of a physical activity that is framed by a health or sport and physical activities professional. It is important as well to inform engaged persons to avoid fast weight loss strategies and even unrealistic by setting the goal that is not the weight normalization, but rather a certain loss that may improve the risk factors (Kraus and al., 2002). It is important to underline that even with a minimum or absent weight decrease, the obese persons having a good cardio-respiratory capacity show a decrease of the risk of the cardiovascular mortality when compared with persons with normal weight but sedentary (Lee, Blair, Jackson, 1999). It has been reported that persons who try to lose weight globally present a significant decrease of mortality causes independently from any weight change (Gregg, Gerzoff, Thompson,

Williamson, 2003, Williamson and al., 2000), with a 25% of mortality decrease within persons going through diabetic overweight (Williamson and al., 2000).

II. Conclusion

Obesity, a public health problem, is a chronic metabolic disorder linked with several comorbidities and mortality increase. Several means and methods allow its diagnosis, particularly, the measure of the Body Mass Index and the waist circumference, which represent reliable means, of simple use and accessible as well. Sedentarity, inactivity and unbalanced diet are linked with its prevalence increase, and the adoption of an active lifestyle as well as the practice of regular sport and physical activities proved to be more than indispensable in order to prevent from and fight against its consequences on health. This practice has to be regular, adapted, secured and often personalized, and ideally under the coaching of a sport and health professional.

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