

The obesity/depression relationship among schoolchildren in the Rabat.Sale.Kenitra region

Oumaima Ibbat*, Youssef EL RHAYAM***, Marouane Aouji*, Mustapha Mouilly**, Nabil Berrid*, El mahjoub Aouane*

*Laboratory of natural resources and sustainable development, Faculty of Sciences, Ibn Tofail University, B.P. 14000. Kenitra, Morocco.

**Laboratory of biologie and health, Faculty of Sciences, Ibn Tofail University, B.P. 14000. Kenitra, Morocco.

*** Laboratory of Advanced Materials and Process Engineering, Department of Chemistry, Faculty of Sciences, Ibn Tofail University, B.P. 14000.

***Laboratory of Organic Chemistry, Catalysis and Environment, Department of Chemistry, Faculty of Sciences, Ibn Tofail University, B.P. 14000.

***Corresponding author: Youssef EL RHAYAM

ORCID:<https://orcid.org/0000-0003-0757-3912>

Abstract- Obesity is gaining ground in Morocco. A phenomenon that could cause other diseases and affect the health of those affected.

This disease is the result of several factors: food, hereditary, physical and also psychological.

To discover the true impact of psychological factors on the appearance of this phenomenon in Moroccan children, our study is based on a survey aimed at primary school children aged between 6 and 12 years in the region of Rabat, Salé, Kenitra les 200 completed questionnaires are processed by the SPSS software which allowed us to note that 52.5% of the obese cases studied always or most of the time feel depressed while the way to manage this depression differs from one child to another.

Index Terms- Childhood obesity, Psychological factors, Depression, Statistical study, Morocco

I. INTRODUCTION

Today considered a global "epidemic" by the World Health Organization (WHO), obesity is placed at the extreme end of the malnutrition continuum and affects almost all populations. The cause most mentioned to explain it is that of a disruption of the energy balance which results from excessive energy intake coupled with too low energy expenditure[1].

Obesity is a polygenic condition (apart from a few exceptional cases of single gene or syndromic abnormalities) in which a large number of genes have amplified effects in a given environment (epi-genetic modifications)[2] The effects of these genes are, for example, modulated by diet and the level of physical activity during life and can also be influenced by bariatric surgery[3].

Certain genetic and social aspects create a predisposition to obesity in certain individuals, while environmental and psychological factors seem to contribute to its maintenance. In addition, certain processes that are still poorly understood seem to influence the way in which the individual processes information and deploys behaviors favoring the balance of the energy balance. The interaction of all these factors establishes that obesity has a complex etiology [4].

Poor diet and inadequate PA may stem directly from the psychosocial factors of obesity. Affected children who have low self-esteem or also experience bullying, depression or weight bias [5].

II. Materials and Methods

This work is a statistical study of obese children at the level of the region (Rabat/Salé/Kenitra).

-Our survey is based on a questionnaire which is formed by closed and open questions intended for children in the age group between 6 and 12 years old.

The period for the distribution of questionnaires began in October 2020 and ended in May 2021.

The data processing was carried out during the year 2022.

The operations carried out during our study consist of several steps indicated as follows.)

Step 1: Have an authorization to access primary schools at the level of the teaching delegation of two cities and also have a list of public primary schools (khemisset and Kenitra) we worked on 10 establishments for each city.

Step 2: The questionnaire used for our survey consists of 5 pages each page is composed of 5 to 8 questions with simple and clear sentences since it is intended for children.

This questionnaire is already processed by a reliability test and we found that all the questions we asked in it are homogeneous with random measurement error = 0.1 less than 1 so the results that will be obtained will be targeted and reliable

Step 3: The visit of each primary school and the observation by the naked eye of the schoolchildren of each school level and with the help of a person in charge we gather all the children who are overweight in an empty class to take the measures which we use for our study the weight / height this operation lasted almost 6 months for each city studied.

Step 4: Filling in the questionnaires by myself, indicating the name/age/ sex and calculating the mass index of each respondent, then converting the paper version of the questionnaires to Excel, which lasted almost 1 month.

Step 5: Results that include 200 responses are processed by SPSS software.

Regarding our questionnaire, the page that deals with the impact of the psychological factor includes 3 questions written in a clear manner.

- Do you feel depressed? the answer will allow us to know the percentage of children who feel depressed and to discover whether depression can be considered as a cause or a result of obesity in children.
- What are you doing to deal with this depression? the purpose of this question to study the different behaviors of the child vis-à-vis depression and to discover if there are actions that influence obesity and also in this direction and to detect that it is the role of parents and community in this situation.

III. Results and discussion

a- You feel depressed

84 of the children never feel depressed with a percentage of 42%, 95 children feel depressed from time to time with a percentage of 47.5% and 21 children always feel depressed with a percentage of 10.5%.

Fig.1

Depression is manifested by symptoms of different nature and intensity. Typical symptoms vary greatly from person to person. According to the criteria of the World Health Organization, a depressive episode is identified as persistent sadness for at least two weeks. It is accompanied by a loss of joy in life, motivation and interest, as well as a decline in concentration and general performance.

b-Depression as a cause of obesity

Stressors that encourage "emotional eating" may be important psychosocial factors in obesity [6], bullying [7], neglect and abuse, [8] or a living environment where there is no consistency, limits and supervision.

Stressed children are more prone to binge eating or emotional eating i.e. overeating to comfort themselves or make themselves unattractive. Parental separation or divorce [9], bullying, physical or mental abuse or violence, and living in successive foster homes are examples of stressors that often lead to overeating. Such challenges can predispose a child or adolescent to use food as a coping mechanism

Chronic stress can also accentuate poor sleep habits [10], fatigue, and resistance to regular PA at school and at home. Insufficient sleep is a known risk factor for obesity. Stress can adversely affect the immune system by increasing the risk of viral upper respiratory infections [11] and further impair regular PA. Stressful life situations (including poverty), generalized anxiety or depression can stimulate neuroendocrine responses. Activation of the hypothalamic-pituitary axis and the sympathetic nervous system can induce intra-abdominal adiposity, insulin resistance and metabolic syndrome through excessive production of cortisol [12].

Weight bias", defined as the tendency to make unfair judgments based on an individual's weight, is an important social problem. Overweight people are often teased and find it difficult to make friends. Children who are obese or overweight are more likely to be bullied, humiliated or ostracized, and to engage in bullying behavior. It is difficult to promote weight loss through only lifestyle changes when a child is unknowingly being bullied and nothing is being done to support them in this regard, [13]. Some bullied children are unable to stick to a healthy eating plan because they eat their emotions. Fear of bullying may cause them to exercise less and stay indoors. Discrimination against obese people is a damaging, pervasive and important social problem that must be addressed quickly and concretely, as part of the child or adolescent's therapeutic regimen.

c- Depression as a result of obesity

Prospective studies have revealed that obese adolescents are at risk for major anxiety and depressive disorders later in life [14]. When obesity becomes chronic, the inability to control weight gain over a long period of time can predispose affected children to depression [15]. The longer the child is overweight, the more likely they are to suffer from depression and other mental health disorders [16]. In addition, childhood depression is associated with higher body mass index (BMI) during adolescence and adulthood [17]. People with depression tend to sleep poorly and feel less energy or motivation to do PA. In some patients, depression is associated with a craving for carbohydrates. Insulin resistance may underlie this craving, as well as the associated hyperphagia and weight gain seen in some depressive syndromes [18].

It cannot always be clearly established whether depression is the cause or the result of obesity, because both possibilities can turn out but what is noticed from our studies and other studies is that Children and adolescents who are overweight may experience harmful psychosocial sequelae, including depression, teasing, social isolation and discrimination, decreased self-esteem, behavioral problems, dissatisfaction with life, body image and reduced quality of life.

d- What do you do to manage depression?

According to the graph children deal with depression in several ways, we found that 54% of children sleep and also 36% watch television and the rest of the cases are divided between those who practice sports, who eat, who draw and children playing video game.

Fig.2

What is observed from these results is that the method of managing stress in children leads in one way or another to gaining weight because if we talk about these 2 factors there sleeping too much and watching television which are major factors of a sedentary lifestyle which always influences the onset of obesity in children.

e- The role of parents in managing their children's depression

Parents play a crucial role in promoting healthy and active living and in managing obesity in children and adolescents [19]. The following parenting responsibilities are particularly important: setting an example, setting limits [20], purchasing healthy foods for family consumption, maintaining healthy family habits (eg, eating and exercising together), manage time and money effectively and ensure that a divorce or separation is as traumatic as possible [21].

Children and adolescents who lack routines, habits, boundaries and supervision at home are more vulnerable to obesity [22]. For reasons still unclear, there is also a higher incidence of obesity in children who do not have siblings. In theory, perhaps the only child would eat more to stave off boredom or loneliness,[23] or the parents would treat their only child more like an adult, serving them larger portions of food, or sharing too much "screen time" with them instead of focusing on physical activity. Children are sometimes pushed by their parents to excel in a given sport, who may be welded together by an aversion to sport and exercise. They may become more sedentary due to "exhaustion" or disillusionment and give up all forms of PA [24].

A parent may find it difficult to discuss their divorce with the clinician, but this event may represent a significant psychosocial factor in obesity [25]. If divorced parents do not communicate or blame each other for their child's health status, it becomes difficult to encourage sustained behavior change. Separation and divorce strain parental resources (time, money, and energy), consistent with healthy eating and regular PA. Some children react to divorce-induced stress by eating their emotions.

f-The role of the community in managing depression in children

First Nations, Inuit, certain ethnic minorities, and children who live in apartments, public housing, or neighborhoods where outdoor play is hampered by weather or lack of safe facilities, are also more vulnerable to obesity, [26]. Limited access to recreational opportunities, parks and neighborhood playgrounds, which stems from urban sprawl and particularly affects low-income families, is also correlated with obesity [27]. Even though many provinces and territories have eliminated quality daily physical education (PE) classes in favor of academic subjects, up-to-date research has found that, in fact, PE classes regulate academic performance and detect the depression. The benefits of PA and participation in sport and recreation programs on the health and well-being of children and adolescents are too often short-circuited by cost, lack of access or opportunity, and parental time constraints [28].

IV. Conclusion

According to our study carried out at the level of primary schools in the Rabat Salé Kenitra region, we found that 58% of children feel depressed either forever or from time to time. Depression as a cause of obesity: plus food factors, lack of physical activity we can consider psychological factors as a cause of obesity if we talk about depression we are talking about the set of actions that absolutely leads to weight gain in children is proven by the way children manage depression (54% of

depressed children manage depression by sleeping and 36% watch television) what we notice by these actions is the lack of physical activity which leads to obesity.

V. Recommendations

Advise children, adolescents and families on their practices, so that they accumulate the daily recommended amount of physical activity and limit their sedentary behaviors, as set out in national guidelines.

Explore psychosocial issues when counseling overweight patients and their families.

Emphasize motivational interviewing to help families adopt and maintain lifestyle modifications, including:

Encourage all caregivers to attend orientation sessions. A written summary of the objectives and measures selected should be given to all those who were unable to attend, in order to promote uniformity of information.

Identify sources of stress in the patient's family and make referrals to mental health professionals as needed, either at the time of lifestyle counseling or before.

Screen the patient for stress, screen for anxiety, depression, low self-esteem and reduced quality of life, and refer the patient to mental health professionals as needed.

Work with other community leaders to improve nutrition and increase physical activity capacity in community centers, child care settings, schools and children's hospitals.

REFERENCES

- [1]. M Mas, MC Brindisi, S Chambaron - Cahiers de Nutrition et de Diététique, 2021 - Elsevier Cahiers de Nutrition et de Diététique Volume 56, Issue 4, August 2021, Pages 208-219.
- [2]. C. Spence et al. Eating with our eyes: From visual hunger to digital satiation brain cogen 2016.
- [3]. A. Batada et al. Nine out of 10 Food Advertisements Shown During Saturday Morning Children's Television Programming Are for Foods High in Fat, Sodium, or Added Sugars, or Low in Nutrients. J Am Diet Assoc (2008).
- [4]. I.M.T. Nijs et al. Differences in attention to food and food intake between overweight/obese and normal-weight females under conditions of hunger and satiety appetite 2010).
- [5]. Puhl RM, Latner JD Stigmatisation, obésité et santé des enfants du pays. Taureau psychologique 2007 Jul; 133(4):557-80.
- [6]. Vaidya V Psychosocial aspects of obesity Adv Psychosom Med 2006/ 27/ 73-85.
- [7]. Puhl RM Latner JD Stigma, obesity, and the health of the nation's children Psychol Bull 2007 Jul; 133 (4) : 557-80.
- [8]. Pinhas-Hamiel O, Modan-Moses D, Herman-Raz M, Reichman B Obesity in girls and penetrative sexual abuse in childhood. Acta Paediatr. 2009;98(1):144-7. Epub.
- [9]. American Academy of Pediatrics, Committee on Psychosocial Aspects of Child and Family Health Helping children and families deal with divorce and separation. Pediatrics 2002;110(10):19-23.
- [10]. Steele JS, Buchi KF Medical and mental health of children entering the Utah foster care system. Pediatrics 2008;122(3):e703-9. Epub.
- [11]. Ievers-Landis CE, Storfer-Isser A, Rosen C, Johnson NL, Redline S Relationship of sleep parameters, child psychological functioning, and parenting stress to obesity status among preadolescent children. J Dev Behav Pediatr 2008;29(4):243-252.
- [12]. Walsh NP, Gleeson M, Pyne DB Position statement. Part Two: Maintaining immune health. Exerc Immunol Rev 2011;17:64-103.

[13]. Anagnostis P, Athyros VG, Tziomalos K, Karagiannis A, Mikhailidis DP Clinical review: The pathogenetic role of cortisol in the metabolic syndrome: A hypothesis. *J Clin Endocrinol Metab* 2009;94(8):2692–701.

[14]. Anderson SE Cohen P, Naumova EN, Jacques PF, Must A Adolescent obesity and risk for subsequent major depressive disorder and anxiety disorder: Prospective evidence. *Psychosom Med* 2007;69(8):740–7.

[15]. Eremis S, Cetin N, Tamar M, Bukusoglu N, Akdeniz F, Goksen D Is obesity a risk factor for psychopathology among adolescents. *Pediatr Int* 2004;46(3):296–301.

[16]. Mustillo S, Worthman C, Erkanli A, Keeler G, Angold A, Costello EJ Obesity and psychiatric disorder: Developmental trajectories *Pediatrics* 2003;111(4 Pt 1):851–9.

[17]. Pine DS, Goldstein RB, Wolk S, Weisman MM The association between childhood depression and adulthood body mass index. *Pediatrics* 200;107(5):1049–56].

[18]. Morgan PJ, Okely AD, Cliff DP, Jones RA, Baur LA Correlates of objectively measured physical activity in obese children. *Obesity* 2008;16(12):2634–41.

[19]. Groupe d'experts sur les Lignes directrices de pratique clinique d'Obésité Canada; Lau CC, Douketis JD et coll. Lignes directrices canadiennes de pratique clinique 2006 sur la prise en charge et la prévention de l'obésité chez les adultes et les enfants [résumé]. *JAMA* 2007;176(8):S1–13.

[20]. American Academy of Pediatrics, Council on Sports Medicine and Fitness, Council on School Health Mode de vie sain et actif : Prévention de l'obésité infantile grâce à une activité physique accrue *Pédiatrie* 2006;117(5):1834–42.

[21]. American Academy of Pediatrics, Comité sur les aspects psychosociaux de la santé de l'enfant et de la famille Aider les enfants et les familles à faire face au divorce et à la séparation. *Pédiatrie* 2002;110(5):1019–23.

[22]. James WPT, Nelson M, Ralph UN, Cuir S Déterminants socioéconomiques de la santé : la contribution de la nutrition aux inégalités de santé. *BMJ* 1997;314(7093):1545–50.

[23]. Brenner JS, Conseil AAP sur la médecine sportive et la condition physique Blessures de surmenage, surentraînement et épuisement professionnel chez les enfants et adolescents athlètes. *Pédiatrie* 2007;119(6):1242–5.

[24]. Yannakoulia M, Papanikolaou K, Hatzopoulou J, Efstathiou E, Papoutsakis C, Dédousis VG Association entre le divorce familial et l'IMC et les habitudes alimentaires des enfants : l'étude GENDAI. *Obésité* 2008;16(6):1382–sept].

[25]. Rydén P J, Hagfor L Coût de l'alimentation, qualité de l'alimentation et position socio-économique : comment sont-ils liés et qu'est-ce qui contribue aux différences dans les coûts de l'alimentation ? *Nutrition Santé Publique* 2010;14(9):1680–92].

[26]. Jeune savoirs traditionnels, Katzmarzyk PT Activité physique des Autochtones au Canada *Can J Santé Publique* 2007;98 Supplément 2S148–60.

[27]. Razani N, Testeur J Obésité infantile et environnement bâti. *Pédiatrie Ann* 2010;39(3):133–9].

[28]. Institut canadien de la recherche sur la condition physique et le mode de vie Bulletin 03 : Obstacles à l'activité physique des enfants. <http://72.10.49.94/fr/node/555> (consulté le 1er septembre 2011).

AUTHORS

Oumaima IBBAT—Oumaima IBBAT, PhD student. Laboratory of natural resources and sustainable development and email address (oumaima.ibbat@uit.ac.ma).

Youssef EL RHAYAM—Doctor, *** Laboratory of Advanced Materials and Process Engineering, Department of Chemistry, Faculty of Sciences, Ibn Tofaïl University, B.P. 14000.

***Laboratory of Organic Chemistry, Catalysis and Environment, Department of Chemistry, Faculty of Sciences, Ibn Tofaïl University, B.P. 14000 and email address (y.elrhayam@gmail.com/youssef.elrhayam@uit.ac.ma).

Marouane Aouji -PhD student. Laboratory of natural resources and sustainable development and email address (Marouane.aouji@uit.ac.ma)

Mustapha Mouilly-PhD student. Laboratory of biologie and health, Faculty of Sciences, Ibn Tofaïl University, B.P. 14000. Kenitra, Morocco.

Nabil Berrid- PhD student. Laboratory of natural resources and sustainable development.

El mahjoub AOUANE—, Professor, Laboratory of natural resources and sustainable development and email address (aouane_mahjoub@yahoo.fr).

Correspondence Author—Youssef EL RHAYAM, email address, (y.elrhayam@gmail.com/youssef.elrhayam@uit.ac.ma) contact number. +212618732347.

Figure capture



Fig.1

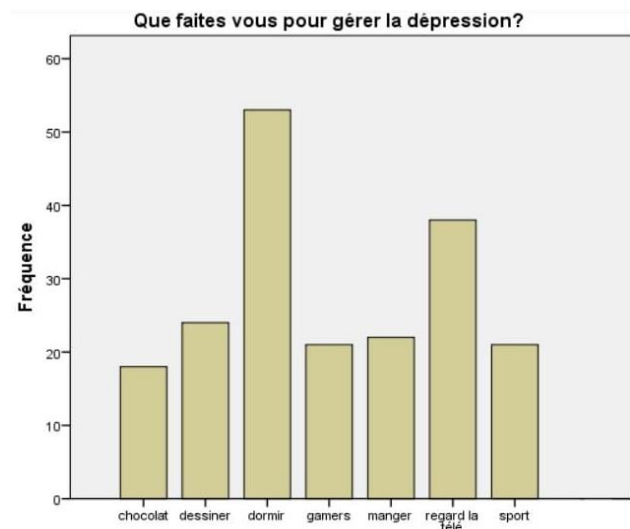


Fig.2