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Nutritional Behavior and its Relationship with Obesity in Down's Syndrome Children

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Author's contribution:
-Ababsa houssam eddin; The first author contributed to the design of the study, the formulation of the problem, and the conduct of the study tests
-Kerroum bachir and kerroum mohamed; did the statistical treatment and interpreted the results and explained them, linking them to the theoretical aspect and previous studies

Conflict of Interest Statement:
The authors undertake that this study has been carried out in light of the requirements of scientific research ethics and scientific honesty, and that it does not conflict with any public or governmental entity.
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Abstract:
This study aims to reveal the nature of the relationship between dietary behavior and daily activity with obesity in children with Down syndrome
When looking for the causes of obesity in this category, we find that most of them are acquired from negative daily practices, because the "Down's Syndrome" patient shares with the community many nutrition problems, such as the frequent intake of simple starches and sugars, the lack of vegetables and fruit in daily food, and the frequent intake of fast food. If these dietary habits constitute a health risk to everyone, their risk is higher in the case of Down's syndrome, because this category has more preparedness for obesity than others. So and in order to do so, we used the descriptive method in the correlational method on a sample of 20 children with Down syndrome, and we used a set of scientific methods to collect data, namely the Inbody device and the BEBQ scale and NAP, and finally we reached a conclusion saying that there is a positive correlation between dietary behavior and obesity in children with Down syndrome.
Keywords: Down's Syndrome ; Obesity ; Nutritional Behavior.

Problem of the study:
Down's syndrome children suffer from many diseases, as a result of the nature of their body composition and physiological and morphological features. One of these diseases is the severe obesity; it obstruct the work of various functional organs and sometimes it curbs their work..., **(Herve Benony et aut, 2008, p. 48**) When looking for the causes of obesity in this category, we find that most of them are acquired from negative daily practices, because the "Down's Syndrome" patient shares with the community many nutrition problems, such as the frequent intake of simple starches and sugars, the lack of vegetables and fruit in daily food, and the frequent intake of fast food. If these dietary habits constitute a health risk to everyone, their risk is higher in the case of Down's syndrome, because this category has more preparedness for obesity than others, due to many reasons, which can be summarized in the following: **(houssameddine, 2019, p. 21)**
- The Down's Syndrome children do not have a mutation of height just as their peers in society; they are shorter than their peers, resulting in fat being stacked in less space, and therefore the speed at which their excessive weight appears. **(Abu Al-Ala, Abdel-Fattah, and Dr. Ahmed Nasr Al-Din , 1994, p. 80**)

- The majority of adolescents with Down's Syndrome suffer from hypothyroidism, which in turn leads to a reduction of 10-15% in their metabolic rate than others. Thus, the rate of food burning decreases, leading to the accumulation of fats and weight increase.
- Weak jaw muscles and slow teeth growth favor soft, high-calorie food from low-calorie vegetables and fruit.
- Unfortunately, the families contribute, though not being aware of the increase in their children's weight, because they got used to think, in the first two years, that their children's problem was "weak weight and refusal of food.", that is why we find that they got used to pursuing them with food whenever possible, in addition to praising them when they eat lots of food, so, they grow thinking that the greedy boy is well-liked. **(• Abdelhamid Kamel Ouahssanine, Mohamed Sobhi , 1998, p. 198)**

But... The biggest problem for adolescents is not "weak weight and food refusal", but what is known as emotional eating, which leads the child to eat for psychological satisfaction and not just to fill hunger, in addition to the tendency of Down's Syndrome subjects to prefer fast food than home food. All this can be expressed with the term nutritional behavior, that contributes in one way or another in determining the level of overweight and obesity of Down's Syndrome subjects.

So, our study came to reveal the nature of the relationship between dietary behavior and obesity in Down's Syndrome subjects.

The problem of the study was formulated as follows:

Is there a correlation between dietary behavior and obesity in Down's Syndrome children?

The following secondary questions arose from the general question:

- Is there a correlation between dietary behavior and obesity in Down's Syndrome children?
- Is there a correlation between the level of physical activity and obesity in Down's Syndrome children?

Through the review of literature on this subject and a series of previous studies, the scientific hypotheses have been formulated as follows:

2. General hypothesis: There is a correlation between dietary behavior and obesity in Down's Syndrome children.

1.2 Partial hypotheses:

- There is correlation between dietary behavior disorders and obesity in Down's Syndrome children.
- There is a correlation between the level of physical activity and obesity in Down's Syndrome children.

3. Objectives of the study:

-Knowing the nature of the relationship between dietary behavior and obesity in Down's Syndrome children.
- Knowing the nature of the relationship between dietary behavior disorders and obesity in Down's Syndrome children.
-Knowing the nature of the relationship between the level of physical activity and obesity in Down's Syndrome children.
-Knowing the contribution of dietary behavior in reducing obesity in people with Down syndrome.

4. The adopted methodological methods:

4.1 Research method : The two researchers used the descriptive method, with the correlative studies, to fit into the nature of the problem to be studied, as the "correlative methods are used to determine to what extent there are variables or in other words to what extent the changes with factors correspond with changes with another factor".

4. 2 The research population and sample: The sample of the research was selected by the intentional method, among 20 children with Down's Syndrome, aged 14 and 16 years, all of them are males.

Table 1: Explain the characteristics of the study sample

Middle of IMC	middle of tall	middle of weight		age
26.34	1,61	85,12	08	14-15 yaer
26.81	1.62	86,89	12	15-16 yaer

4. 3 Research tools:

4. 3. 1. Physical measurements:

The two researchers used the appropriate tools to the nature of the study, which meet the scientific criteria (reliability-consistency-objectivity) with a high degree as follows:

- Measuring the chronological age, height and weight.

a-Age: by reference to the date of birth
b-Height: It has been calculated in centimeters, using height calculator.
c. Weight: It has been calculated in kilograms, using the In Body device.
It is a device to measure the proportion of body components : muscles, fats, water and bones. It also gives an estimation of basal metabolic rate requirements for daily calorie energy BMR, as well as BMI.
Where this device depends on the BIA, (BIOELECTRIC IMPEDANCE ANALYSIS). It is a factor based on the relationship between body weight and the percentage of accompanying body water, as well as other biological data (age and gender...)..
The sample was subjected to measurement on an empty stomach, after exit of the bathroom and before any physical activity (with care to stand on the feet 5 minutes before measurement, because sitting or lying changes the distribution of water in the body) **(Ibrahim, 1996, p. 89)**

4. 3. 2. Psychometrics:

A - The Baby Eating Behavior Questionnaire (BEBQ) This questionnaire was used to research eating behavior by (**vanstrien of al 1986)** in order to evaluate the pattern of behavior in eating, and this questionnaire consists of 33 questions divided into three categories: cognitive adherence, emotional eating, and external eating **(Aladdin, 2018, p. 93)**

B - Nutrition and Physical Activity Assessment Tool(NAP): This questionnaire, prepared by **Marin 2000**, contains 7 dimensions, each dimension representing a level of daily activity per hour within 24 hours ... Where the NAP of the sample is determined by comparing the number of hours of daily activity on a standard table that determines the level of NAP for each individual of the sample **(Bahaa El-Din Ibrahim Salama,., 2002, pp. 145-146)**

Psychometric stability:

We have found the stabilization factor using the method of applying and reapplying the test, as the Baby Eating Behavior Questionnaire (BEBQ) and Nutrition and Physical Activity Assessment Tool(NAP) on 07 children from the research population and from outside the principal research sample (survey sample) and after eight (08) days, the application was repeated in the same terms as the first procedure. The Pearson correlation coefficient was calculated between the first application degree and the second application degree; the following table shows the degree of the Pearson correlation coefficient.

Table 2: illustrates the calculation of the stability coefficient of measurements

Variables	Correlation Coefficient
Nutrition and Physical Activity Assessment Tool(NAP)	0.81
Baby Eating Behavior Questionnaire (BEBQ)	0.70

Table 1 shows that the correlation coefficient of the variable of Nutrition and Physical Activity Assessment Tool (NAP) has reached 0.81 and the Baby Eating Behavior Questionnaire (BEBQ) has reached 0.70, which are all correlation coefficients we can rely on in judging the stability of the test.

Reliability of the measurements: The researcher found the coefficient of measurements reliability, using self-reliability which is equal to the square root of the constancy coefficient.

Table 3: illustrates the calculation of the coefficient of measurements reliability

Variables	Correlation Coefficient	self-reliability
Nutrition and Physical Activity Assessment Tool (NAP)	0.81	0.90
Baby Eating Behavior Questionnaire (BEBQ)	0.70	0.83

The table shows the increase of test reliability coefficient, which indicates its applicability.

5. Statistical means:

The researcher used the Statistical Package for the Social Sciences (SPSS), as well as the manual method; and found the following:

1. The arithmetic mean.
2. The standard deviation.
3. Spearman's correlation coefficient.

6. Presentation, interpretation and discussion of results

6. 2 The first hypothesis results:

The hypothesis states:

- There is a correlation between dietary behavior disorders and obesity in Down's Syndrome children.

Table 4 : shows Spearman's correlation coefficient between dietary behavior disorders and obesity.

		Dietary Behavior Disorders	Obesity
Obesity	Spearman's degree	1.000	0.845**
	Significance		0.01
	Number of the sample	18	18
Dietary Behavior Disorders	Spearman's degree	0.845**	1.000
	Significance	0.01	
	Number of the sample	18	18

From the previous table: the correlation coefficient = 0.845* * and at a significance level below 0.01 so, it can be said that the relationship between dietary behavior disorders and obesity is a strong positive relationship and has a statistical significance at the level of 0.01

Figure 1: A graph illustrating the form of prevalence of the relationship between dietary behavior disorders and obesity.

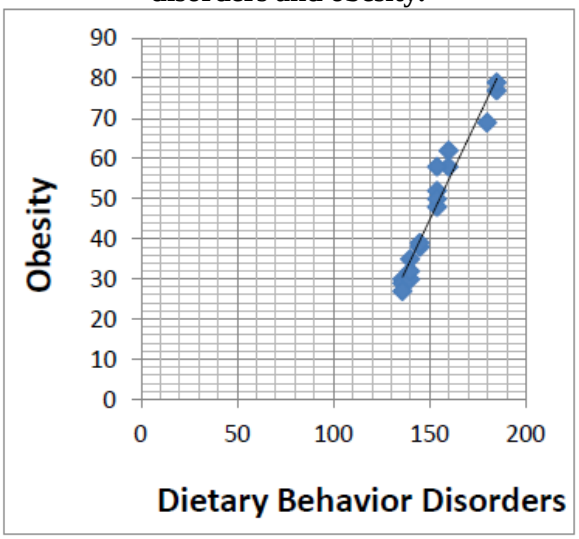

Figure 1 shows us that the data are distributed in linear form, from right to left and therefore there is a strong positive linear relationship between dietary behavior disorders and obesity.

6. 2 The results of the second hypothesis

The hypothesis states:

- There is a correlation between the level of physical activity and obesity in Down's Syndrome children.

Table 5: Correlation coefficient shows the level of physical activity and obesity.

		Level Of Physical Activity	Obesity
Level Of Physical Activity	Spearman's degree	1.000	-0 .634 *
	Significance		0.05
	Number of the sample	18	18
Obesity	Spearman's degree	-0 .634 *	1.000
	Significance	0.05	
	Number of the sample	18	18

From the previous table: the correlation coefficient = 634. 0- * And at a significance level below 0.05 so, it can be said that the relationship between the level of physical activity and obesity is negative and has a statistical significance at the level of 0.05

Figure 2: A graph illustrating the prevalence of the relationship between the level of physical activity and obesity.

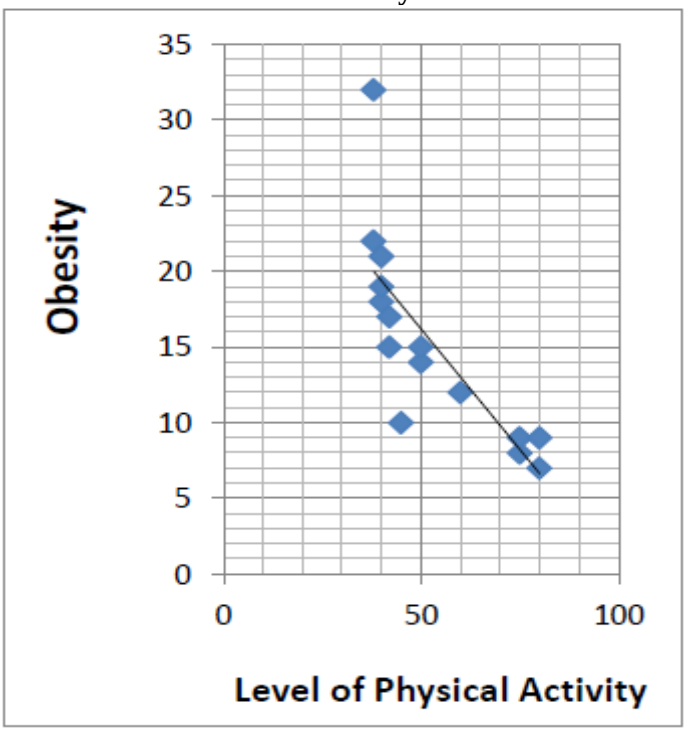

Figure 2 shows that data are distributed in linear form, from the left to right and therefore there is a negative linear reversed relationship between the level of physical activity and obesity.

6.4 Discussion of hypotheses:

Through presenting the results of the first and second hypothesis, we see a strong correlation on both the negative and positive sides, as we see the emergence of a positive correlation between dietary behavior disorders and increased obesity in Down's children, which is due to a combination of illnesses and causes that clearly contribute to the appearance of obesity; some of them are acquired and some others are organic, emotional eating for example results from all the accumulations acquired by Down's child at the stage of early childhood, as a result of the encouragement by the parents and family for excessive eating, as Down's child in this early stage of childhood is characterized by the lack of appetite, which leads the entourage to encourage excessive eating. This creates in Down's child a kind of habits and misperception towards food .... In addition to the parents' excessive affection for Down's child, which makes it difficult to persuade him to eat healthily and to stay away from harmful sweets and starches. **(Yazid, 2018, p. 21)**

The appearance of the second hypothesis results, with a strong negative relationship between the level of physical activity and obesity, is considered to be observation of the obvious. As it is known that physical activity contributes to the maintenance of a perfect body and fights obesity.... However, the lack of the daily physical activity among Down's children is due to several reasons... for example, hypothyroidism always makes them feel exhaustion and fatigue. Also, the lack of muscular tone and muscular tension among them makes them lose the opportunity to provide the body with various nutrients and essential elements, which is reflected in their daily activity level.... In addition, most Down's children do not practice sport; this factor also prevents them from getting a perfect body and fighting obesity **(• Abdelmalek Kermich, Ababsa Houssemeddine, 2016, p. 19)**.

7. Conclusion:

After analyzing the results of hypotheses validity and their interpretation, the study reached the following results:

1- There is a positive correlation between dietary behavior disorders and obesity in Down's syndrome children.

2- There is a negative correlation between the level of physical activity and obesity in Down's syndrome children:

In light of these findings, the general question has been answered and the hypotheses of the study were accepted, i.e. there is a correlation between dietary behavior and obesity in Down's syndrome children.

Also, the researchers suggest the following:

- Proposing programs to adjust the dietary behavior in Down's syndrome children.
- Organizing awareness days for the families of children with Down's syndrome, about the risk of obesity and how to fight it.
-Assimilating and knowing the physiological and morphological composition nature of Down's syndrome children and how to deal with it.
- The necessity of introducing adapted physical activity in the daily schedule of this category, to raise their physicaefficiency.

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