Research Article

Use Factor Analysis in Determining Most Important Factors Affecting Childhood Obesity

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Abstract: Childhood obesity is one of the most important health problems prevalent in all countries of the world, as many studies conducted in most countries of the world indicate that there is a marked increase in the prevalence of obesity and overweight among children in various societies, and the reports of the World Health Organization have indicated an increase Disturbing in the rate of obesity in children in early childhood, as it has become a global epidemic, according to the description of the World Health Organization [1]. It was found that about 40 million children under the age of five suffer from overweight and obesity, as the percentage of children who suffer from obesity increased in age (5 to 19) years old from 1 in 10 children in 2000 to approximately 1 in 5 children in 2016. [4]The causes of obesity are many and varied, and the possibility of a child being exposed to the risk of being overweight and obese is due to the overlap of many biological and environmental factors. It is well known that maintaining the normal weight of the body requires a balance between the thermal energy entering the body (through food) and the heat energy consumed (through the energy consumed in each of the basic vital processes, represented in the digestion and absorption of food, as a result of carrying out the usual daily activities. Including physical activities and sports, and this adds the energy needed for growth in pre-adulthood. [3]. The importance of the research lies in identifying the most important factors causing obesity in children whose ages range from 5 to 14 years, through the use of a factor analysis method that revealed the presence of 5 main factors that had a clear effect on childhood overweight and obesity.

1. Introduction

Obesity definition:

Obesity is defined as an increase in the percentage of fat and its accumulation under the skin and around body tissues that are different from the normal limits [6], and this accumulation results from an imbalance between energy intake from food and energy consumed in the body [5], where fat accumulates under the skin and in various body tissues [10].

Childhood obesity

It is obesity that occurs in childhood years and is considered more difficult than obesity in adults, due to the possibility that a fat person will remain fat in adulthood. [10] Its difficulty lies in the fact that the increase in fat tissue is not only by enlarging the cell, but by increasing the number of fat cells, and if the number of fat cells has increased, so they do not decrease in number even with the practice of various weight loss programs, but only the size of fat cells decreases, so most children with obesity remain suffering from them even after adulthood. [3]

Obesity in children has many health risks, as it is considered the beginning of the road to many health problems that were previously considered problems for adults, such as cardiovascular disease, high cholesterol, high blood pressure, diabetes second type, acute and advanced fatty hepatitis, and also leads to problems of apnea and shortness of breath during sleep [6], arthritis, gout, varicose veins, and digestive diseases [3]. Childhood obesity can also lead to many psychological problems represented by low self-esteem and frustration as a result of these children being exposed to bullying and ridicule of children who have a healthy weight, which affects them significantly. Negative in the future [8]. This is represented by their irregularity in attending school and their reluctance to participate in sports and social activities. [10]

The early childhood years are an important stage in preventing obesity in later life stages. [3]

Obesity measures

The diagnosis of obesity is based on the body mass index (BMI), which is related to the health of the body's appearance, depending on its height.

And its weight as an acceptable standard clinical measure for overweight and obesity for children aged two years and over according to the following equation:

BMI = body weight in kilograms / square height in meters [6]

Where the World Health Organization defined obesity indicators according to the following classifications [9]

	Obesity indicators	No.
29 ,99 – 25 Kg	Overweight	1
Kg 34,99 - 30	Low obesity	2
Kg 39 , 99 – 35	Medium obesity	3
Kg 40 ≤	Severe obesity	4

This study relied on World Health Organization criteria to determine overweight and obesity from the age of 5 years to less than 19 years through the body mass index plus two standard deviations and plus one standard deviation for obesity, according to the standards of the WHO. [1]

2. The Study Sample

A random sample consisting of 150 children aged (5-12 years) suffering from overweight and obesity was selected through an electronic form that was shared through social media sites due to the difficulty of obtaining information by direct methods due to the impact of the Corona pandemic and after work is disrupted in all Schools, universities and most institutions in Iraq, and after excluding inappropriate forms, 150 questionnaires were selected, emptied and entered into the SPSS statistical package, and then subjected to statistical treatment through the use of a factor analysis method for the purpose of identifying the factors causing obesity in children.

After completing the questionnaires, 23 variables were assigned, including (x_1: gender, x_2 : age: x_3, height: x_4 ,weight: x_5, number of brothers and sisters: x_6, the child's arrangement among his siblings: x_7, the mother's marital status: x_8,the child's family status: x_9, the economic situation of the family: x_{10}, the mother's work: x_{11}, the child's bedtime: x_{12}, the child's possession of electronic games: x_{13} , the time the child spends sitting on electronic games: x_{14} , genetics: x_{15}, fast food: x_{16} , Sweetened juices and soft drinks: x_{17}, the child's exercise of sports: x_{18} ,medicine: x_{19} , the way to go to school: x_{20} , the amount of the child's daily expense: x_{21} , the child's behavior within the family: x_{22} ,the child eating breakfast: x_{23},the presence of a sports lesson in the school)

After analyzing it statistically using the percentage first, it was found that the percentage of males suffering from obesity was 47%, while the percentage of females was 53%, which indicates that the possibility of females being exposed to the risk of obesity is greater for females than it is for males, and the degree of obesity that suffers is classified Including children according to the global obesity indicators, as shown in the table below:

Table No. (1)

The ratio	Children Number	Obesity indicators	No.
%63,33	95	Overweight (25 - 99 29) kg	1
% 30	45	Low obesity (30 - (34.99) kg	2
% 5 , 33	8	Medium obesity (35 - 99, 39) kg	3
%1,33	2	Severe obesity (≤ 40 kg)	4

Moreover when doing a factor analysis using the basic components method, this aims to take P from the response variables :

$x_1, x_2, \dots, x_p$ and find a linear combination of these variables to produce unrelated components $z_1, z_2, \dots, z_p$ called the main components. Where the first basic component is expressed as follows:

$$Z_1 = a_{11}X_1 + a_{21}X_2 + \cdots + a_{p1}X_p$$

Where a_{ij} represents the saturations of the response variables by the first factor, while the second component expresses it

$Z_2 = a_{12}X_1 + a_{22}X_2 + \cdots + a_{p1}X_p$

And these compounds are arranged so that Z_1 exhibits the largest amount of change and Z_2 displays the second largest amount of change, and so on, so that is [13].

$Var\ (Z_1) \geq Var\ (Z_2) \geq \cdots \geq Var\ (Z_p)$

Where the equation can be written in matrix form as follows [14]

$Z_{(p\times m)} = A_{(p\times m)}F_{(m\times 1)} + U_{(p\times 1)}$

$$\begin{bmatrix} Z_1 \\ Z_2 \\ \vdots \\ Z_p \end{bmatrix} = \begin{bmatrix} a_{11} & a_{12} \dots & a_{1m} \\ a_{21} & a_{22} \dots & a_{2m} \\ \vdots & \vdots & \vdots \\ a_{p1} & a_{p2} & a_{pm} \end{bmatrix} \times \begin{bmatrix} F_1 \\ F_2 \\ \vdots \\ F_m \end{bmatrix} + \begin{bmatrix} U_1 \\ U_2 \\ \vdots \\ U_P \end{bmatrix}$$

The basic components method is summarized by extracting the value of the latent roots (Eigen Value), which represents the sum of the squares of the contributions of all the variables to each factor of the matrix separately and that its value decreases from one factor to another according to the order. The correct one is accepted as a factor, and if it is less than one, it is rejected. The sum of the latent roots expresses the variance that can be explained by the factors, as the proportion of the variance explained by each factor is calculated by extracting the ratio of the eigenvalue that accompanies each factor to the number of variables using the characteristic equation*:* [12]

$$|\lambda I - A| = 0$$

And then extract the value of the eigenvectors associated with each eigenvalue selected according to the following equation:

$$|R - \lambda I|a = 0$$

Where the eigenvalue represents the amount of the factor's contribution to the sum of the common values, and the eigenvector associated with the largest eigenvalue represents the estimated loads of the first factor, and the second vector associated with the second largest eigenvalue represents the estimated second factor loads and so on, thus we obtain a matrix of the first estimated factor loads: [14]

$$A_1 = \begin{bmatrix} a_{11} & a_{12} \dots & a_{1m} \\ a_{21} & a_{22} \dots & a_{2m} \\ \vdots & \vdots & \vdots \\ a_{p1} & a_{p2} & a_{pm} \end{bmatrix}$$

After that, the communalities, which represent the sum of the squares of the factor's loads on the various variables, are extracted from the factor matrix. Each variable contributes with different sizes to each of the factors, and the sum of the squares of the variable's contributions on the factors of the matrix are the values of the prevalence of the variable, which represents the proportion of the variance that is Explained by the extracted factors for these variables. [13]

When obtaining the matrices of the estimated factor loads, we begin to interpret the relationship between the variables according to the (Kaiser) criterion, which is based on choosing the number of factors so that it is equal to the number of eigenvalues that exceed the integer one. [12]

The preliminary results of the factor analysis were represented in the table below

Table No. (2) the preliminary results of the test

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.385	23.415	23.415	5.385	23.415	23.415
2	1.925	8.370	31.785	1.925	8.370	31.785
3	1.669	7.255	39.040	1.669	7.255	39.040
4	1.570	6.825	45.866	1.570	6.825	45.866
5	1.289	5.605	51.471	1.289	5.605	51.471
6	1.183	5.143	56.614	1.183	5.143	56.614
7	1.131	4.918	61.532	1.131	4.918	61.532
8	.979	4.258	65.790			
9	.960	4.175	69.965			
10	.864	3.757	73.722			
11	.846	3.680	77.401			
12	.706	3.071	80.472			
13	.683	2.967	83.439			
14	.634	2.756	86.196			
15	.615	2.676	88.872			
16	.527	2.290	91.162			
17	.450	1.959	93.120			
18	.424	1.845	94.966			
19	.362	1.573	96.538			
20	.358	1.557	98.096			
21	.284	1.233	99.329			

22	.126	.546	99.875			
23	.029	.125	100.000			

Extraction Method: Principal Component Analysis.

When observing the table, it becomes clear that some of the variables did not reach the required degree of saturation, which was defined as (0.6) as a minimum [12]. Therefore, those variables were excluded and the statistical analysis process was repeated using the factor analysis method, as well as the process of rotating the axes using the Varimax method (the greater variance method) to obtain more accurate results and move away from randomness in determining factors. The rotation process also helps to make a logical interpretation of the factors [13], as it was found that there are five factors that have a direct relationship to the effect on weight gain in children under the age of 14 years that cause their obesity, as it represents **74,334** of the total variance and have distinct roots greater than 1, and this can be seen in the following tables

(Table No. (3) the initial values of ramifications (socialism)

Communalities

	Initial	Extraction
Baby age	1.000	.874
Height in CM	1.000	.881
Weight in Kg	1.000	.783
Marital status of the mother	1.000	.704
With whom the child lives	1.000	.761
The economic condition of the family	1.000	.719
Is the mother working?	1.000	.721
What is the child bedtime?	1.000	.552
Does the child have a mobile,ipad,or tablet device?	1.000	.583
Does the child drink soft drinks a lot?	1.000	.609
Did the child take any type of medicine containing cortisone?	1.000	.763
Is there a sport lesson in the school?	1.000	.969

Extraction Method: Principal Component Analysis.

Table No. (4) Matrix of components before recycling

Component Matrix[a]

	Component				
	1	2	3	4	5
Baby age	.923	.068	-.100-	-.076-	-.034-
Height in CM	.929	.058	-.106-	-.057-	-.024-
Weight in Kg	.877	-.039-	-.098-	-.060-	.005
Marital status of the mother	-.273-	.680	-.363-	.124	.140
With whom the child lives	.205	-.793-	.277	.086	.082
The economic condition of the family	-.139-	.427	.574	-.418-	-.110-
Is the mother working?	.062	.242	.707	.334	-.220-
What is the child bedtime?	.690	.171	.107	.136	-.128-
Does the child have a mobile,ipad,or tablet device?	.734	.193	.085	.004	-.004-

Does the child drink soft drinks a lot?	.752	.068	.012	.107	.164
Did the child take any type of medicine containing cortisone?	-.069-	.075	.018	.861	.102
Is there a sport lesson in the school?	.048	.083	.268	-.095-	.937

Extraction Method: Principal Component Analysis.

a. 5 components extracted.

Table No. (5) The Latent Roots (Variation of the Components)

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.212	35.099	35.099	4.212	35.099	35.099	4.117	34.306	34.306
2	1.425	11.877	46.976	1.425	11.877	46.976	1.473	12.277	46.583
3	1.160	9.667	56.643	1.160	9.667	56.643	1.194	9.954	56.537
4	1.102	9.186	65.829	1.102	9.186	65.829	1.102	9.185	65.722
5	1.021	8.505	74.334	1.021	8.505	74.334	1.033	8.612	74.334
6	.793	6.612	80.945						
7	.684	5.703	86.648						
8	.510	4.247	90.895						
9	.485	4.043	94.938						
10	.412	3.430	98.368						
11	.161	1.339	99.707						
12	.035	.293	100.000						

Extraction Method: Principal Component Analysis.

Table No. (6) Matrix of basic components after recycling

Rotated Component Matrix

	Component				
	1	2	3	4	5
Baby age	.924	.067	-.082-	-.092-	-.033-
Height in CM	.928	.073	-.093-	-.073-	-.027-
Weight in Kg	.859	.154	-.131-	-.070-	-.005-
Marital status of the mother	-.129-	-.810-	-.071-	.145	.077
With whom the child lives	.049	.857	-.092-	.094	.083
The economic condition of the family	-.099-	-.178-	.680	-.449-	.113
Is the mother working?	.075	.086	.792	.280	-.046-
What is the child bedtime?	.707	.019	.185	.103	-.087-
Does the child have a mobile,ipad,or tablet device?	.751	-.007-	.133	-.014-	.043
Does the child drink soft drinks a lot?	.751	.075	-.018-	.111	.165

Did the child take any type of medicine containing cortisone?	-.041-	-.071-	.074	.866	.020
Is there a sport lesson in the school?	.034	.006	.020	.002	.983

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The First Factor: (bad health habit)

This factor formed (34,306) of the total variance, which indicates the importance of this factor in explaining the factors that cause obesity in children as the variables of this factor were represented

1- x_1 : The age variable with saturation amount 924,0
2- x_3 : length, with a saturation of 928,0
3- x_4 : The child's weight, with a saturation, is 877,0
4- x_{11} : Bedtime at 0,707 saturation
5- x_{12} : Owning a mobile phone and the amount of saturation is 0,751
6- x_{16} : Drink sweetened juices and soft drinks, at a saturation of 0,751

Through noticing the variables of the first factor represented by (the child's age, the child's height, the child's weight, the child's sleeping time, the child's possession of a mobile phone, iPad or any tablet device, the child's consumption of artificial juices and soft drinks), we find that they are closely related to the healthy habits that the child practices. Which becomes clearer as the child gets older, especially at the beginning of adolescence, and the increased desire to get out of parental control, and as a result of the development in all areas of life and the globalization that has swept the world and the shift in what children eat from traditional to modern feeding patterns, and the spread of fast food and foods saturated with sugar and saturated fats [4] As fast food has become available in all malls and public places in addition to the speed of obtaining it with the popularity of home delivery service, the role of the media in promoting these products through visual illusions and appetizing product photography and adding flavor enhancers to meals to make the consumer addicted cannot be excluded. Children are considered the most affected by these advertisements, which negatively affects their choices and their current diet Future and thus has a clear impact on their health. [17]

Eating high-calorie foods regularly, such as: fast foods, baked goods, snacks, sweets and sweetened juices including fruit juices and soft drinks are all factors causing obesity in adults and children alike. Consumption of sugar-sweetened beverages is associated with the risk of developing the second type of diabetes and is associated with weight gain. One 330ml can of soft drinks with added sugar can contain up to 35 grams of sugar. [1]

It is evident from the study of this factor that one of the most important causes of weight gain is the excessive intake of sweets and sugars, as well as high refined white sugar as it gives a high percentage of calories that represent a burden on the body as the body converts the surplus of these calories into fat that accumulates inside it. In addition to this, the use of table salt in large quantities, which cause the retention of fluids in the body. [3] What cannot be ignored is the correlation of high prices of healthy foods compared to foods that have little nutritional benefit and rich in calories in the local market, with the possibility of overweight in children and their exposure to obesity. [15] From the study of the sample, it became clear that the percentage of children who consumed sweetened juices and soft drinks on a daily basis was 62% of the total sample.

The factor of healthy habits also includes the variable of the child's ownership of a mobile device or any other tablet device, as it contributed to a saturation of (751.0) and the percentage of children who own a mobile phone or any other tablet device is 72%, as recent studies have shown that there is a strong relationship between the hours that the child spends in watching television or using electronic devices and between being overweight in children and thus making them more at risk of childhood obesity [6], as the percentage of Internet users has increased significantly in recent times, in a recent study it proved that the percentage of people who have access to the Internet It increased from 1% in 1990 to 45.6% in 2000 and to 68.8% in 2008, and it continues to increase until the Internet services are almost accessible to everyone at the present time. [15] Where these media contribute to the lazy lifestyle, which. It is a cause of the decrease in physical activity practiced by the child, and thus it is one of the factors causing obesity in children. [2]

Among the wrong dietary habits is eating food while using these media, represented by snacks such as (potato chips, pastries, sweets, sweetened juices, soft drinks, etc.) which are rich in calories and thus be one of the factors contributing to weight gain and obesity in children. [7] Where the child eats large quantities of food without awareness and without feeling full, which leads to an increase in body weight and obesity. [3]

Among the other variables that contributed to the saturation of this factor is the variable of insufficient sleep. The percentage of children who go to sleep after midnight was 71% and this negatively affects the health of the children and their diet. Where recent studies have shown that short sleep periods for children under the age of four are associated with an increased risk of weight gain and obesity by almost twice, and also indicate that adequate sleep in infancy and the pre-school period may reduce the risk of obesity and that sleeping less than eight hours a day increases From the possibility of obesity in children. [2] In addition to this is the bad quality of sleep represented by not sleeping early and keeping the child awake for long hours after midnight, which leads to the child's exposure to reduced insulin action and hormonal disorders, which increases the child's appetite, as it pushes the child to eat meals light and rich in calories immediately before bed, which increases the risk of obesity in children. [6]

Wrong sleep habits lead to a decrease in the level of metabolism in the body, which leads to a decrease in the amount of energy consumed, and thus an increase in the percentage of body fat and weight gain. One of these wrong habits is going directly to sleep after dinner, as this leads to storing dinner food energy in the form of fat that accumulates inside the body and thus leads to weight gain and obesity. [3]

The second factor: (social factors)

This factor comes in the second range in importance and explains (12.277%) of the total variance, as for the variables of this factor they

x_7: The variable of the maternal marital status with saturation amounting to 0, 81

x_8: The variable of the child's status within the family with a saturation of 0,857

Through the results of the statistical analysis, it appeared that this factor includes two variables, namely the marital status of the mother (married, divorced or widowed) and the variable of the child's family status (with whom does the child live? with both parents or one of them) with a saturation of (81 0) and (857, 0) Straight.

To analyze this factor, it became clear that the family environment has an effective role in increasing the weight of children through the types of foods available at home that are preferred by family members, as well as the nature of the meals, their quantities and the times of eating these meals are all factors that help to increase the weight of children if these habits do not stem A healthy diet, as well as the nature of the family's daily life if it encourages physical activity or follows an inactive lifestyle are all factors that influence children's tendencies and dietary trends [7]

As many children grow up at the present time in environments that encourage overweight and obesity, as it is called (the obesity environment), and as a result of globalization and urbanization, the risk of exposure to an obese environment increases in high-income countries and low and middle-income countries alike and in all socio-economic groups. Changes in the availability and types of food, as well as reduced physical activity needed for transportation or play, have led to an imbalance in energy level. Children are the most vulnerable age groups to foods rich in energy and poor in useful nutrients, which are characterized by being cheap and easy to obtain. [4]

What is observed at the present time and in all societies is the diminishing opportunities for physical activity both inside and outside schools, and an increase in the time devoted to entertainment activities that are based on screen and characterized by lack of movement. [17] The role of family and friends on the child's tendencies and nutritional habits cannot be neglected, as the family and friends have a clear influence on the individual's lifestyle and daily habits [6] and the risk of obesity can be transmitted from one generation to another as a result of behavioral and biological factors, and behavioral influences persist across generations, as children inherit social status. Economic, norms, cultural behaviors, and family behavior related to nutrition and physical activity. [1]

Through a review of previous studies, it became clear that for mothers who suffer from overweight or malnutrition before or during pregnancy, and for mothers who gain weight during pregnancy, they are more likely to have children who are overweight than others. [8]

It was also found that psychological disorders represented by anxiety and depression are among the factors that cause obesity, through the child's resorting to eating meals in excess of the body's daily need and thus causing him to gain weight and obesity, so anxiety and depression may be the cause and consequence of obesity. [7]. Personal, parental and family stress may increase a child's risk of obesity. Where some children eat a large meal

of food to overcome problems, or to treat some emotions such as: tension, or fight boredom. And their parents may have similar tendencies. The risk of obesity can be transmitted from generation to generation, and the health of the mother may affect the growth of the fetus and expose the child to the risk of suffering from obesity, as the care provided to the woman before, during and after pregnancy severely affects the health and development of the child at a later time and the first years of life are important in the formation of feeding behaviors. Good and physical activity that reduces the risk of obesity [17] and breastfeeding a child is one of the factors that help reduce the likelihood of a child being exposed to overweight and obesity in the child's early years. [16]

The Third Factor: (the Economic Factor)

This factor explains (9.954%) of the total variance and includes the following variables :

x_9: Variable of the family's economic status, with a saturation of 0,68

x_{10}: The mother's work variable, with a saturation of 0,79

This factor includes two variables: the family's economic status with saturation of (0,68) and the variable of the mother's work with saturation of (0,79) as it became clear that the economic situation of the family has a role in increasing the likelihood of children being exposed to the risk of overweight and obesity, and this factor can be explained through Study the sample, it became clear that the percentage of children who did not eat breakfast was (39%) and children who ate breakfast sometimes was (34%). By asking about the amount of the child's daily allowance, it was found that the children whose daily allowance was (≤ 1000 dinars) was (62%) and less than 1000 dinars, the percentage was (37%), which prompts the child to compensate for breakfast by buying what is available in school stores of sweets, sweetened juices and soft drinks, which are rich in calories, which give the child a feeling of fullness, which leads to his symptoms of eating Healthy foods.

It also became clear that the mother's work variable has a role in increasing childhood obesity, through the working mother's resort to preparing fast food that does not take a long time in preparation such as pasta, pastries and others, which are rich in calories and thus be a cause of weight gain and obesity.

Forth Factor (pharmaceuticals)

This factor explains (9.185%) of the total variance and includes one variable that mainly contributes to its formation, which is (the child eats any anti-depressant and allergy medication)

x_{18} : The child's intake of drugs to a saturation amount of 866,0

Some prescription medications, such as glucocorticoids, and antipsychotics, may increase the risk of obesity. These include risperidone, olanzapine, antiepileptics and allergies [6].

It has been found that some medications may lead to weight gain if not compensated for through diet or activities. These medications include some antidepressants, diabetes medications, antipsychotic drugs, steroids, and beta blockers [3].

Fifth Factor (physical activity)

This factor comes last in terms of its importance in explaining the relationship between the variables, as it represents 8.612% of the total variance and this factor contains one variable that mainly contributes to its formation, which is (physical activity),

x_{17}: Child not engaging in any physical activity 983, 0

This factor is considered one of the main factors associated with the emergence of obesity in children, which is represented by the lazy lifestyle prevalent in society in general and children in particular, where the daily lifestyle of the child is characterized by lethargy and lack of movement, whether at home, by spending long hours watching TV or playing games With the accompanying consumption of sweets, gypsum and sweet drinks, or the way to go to school, the majority of children use the car as a way to go to school, so that the parents 'argument is for the distance of the school from the places of residence, lack of safety, and parents' fear of their children from accidents and being the most comfortable way for the child. [7] From the observation of the study sample, it became clear that the percentage of children who use the car as a way to go to school was (68%) and those who use the car sometimes and walk at other times, their percentage was (18%), while the percentage of children who go to school on foot was (14%) which is a small percentage compared to others

The decrease in physical activity in children is not limited to the home environment, but the school has a role in the decrease in the level of physical activity in children by reducing or dispensing with sports lessons and focusing on academic achievement [2]. Only (9%), which is a very low percentage, which reflects negatively on children's health and their attitudes and tendencies towards movement and play.

The lifestyle that we live and the work we practice are among the most important causes of the spread of obesity at the present time as it contributes to reducing muscle effort and the types of intended or unintended movement, so many children do not consume all the prices they consume during daily activities. All of these reasons reduce the physical activity that the child performs and thus increase his risk of being overweight and obese. [3] Although children in early childhood stage usually tend to love physical activity and movement, some of them may not get what they need from the movement activities necessary for their health, physical growth and motor development, due to the lack of space available for play and movement, Or because of fear and excessive protection by parents for their children, or the parents' lack of awareness of the importance of the child's motor activity, physically, psychologically and socially. Therefore, it is not surprising that we find in our time that a remarkable proportion of children spend most of their daily time in non-motor activities, which may enhance their inactivity behavior, such as watching television, or playing video and computer games, and similar activities. Although these non-motor games may develop discovery and imagination, they certainly do not develop their motor skills, do not develop their physical fitness, and do not contribute to the promotion of their organic health. [18]

3. Results

1. The number of children suffering from overweight and obesity has increased in recent decades and in various developed and developing societies alike. The proportion of children aged 5-19 years who are overweight increased from about 1 in 10 children (10.3 percent) in 2000 to just above 1 in 5 children (18.4 percent) in 2016.

2. Childhood overweight and obesity are serious health problems for children, during their childhood and in the later stages of their lives. In childhood, it can cause a number of health problems, including complications in the digestive system and the skeletal system, in addition to the onset of the diabetes second type, behavioral and emotional problems, including depression and mental disorders.

3. Childhood obesity is a strong indication of suffering from obesity in adulthood, which may lead to serious health and economic consequences. For many children who suffer from overweight and obesity in childhood, obesity continues to accompany them in their later stages of life.

4. There are many social and biological factors that play a fundamental role in increasing the likelihood of a child being exposed to overweight and obesity.

5. Unhealthy diet, a high-calorie diet - which lacks fruits and vegetables, is full of fast food, and crammed with high-calorie drinks and extremely large portions of food - contributes to gain weight.

6. The wrong healthy habits represented by the frequent consumption of foods rich in calories and whose nutritional value is low, such as sweets, pastries, sweetened juices and soft drinks, have a prominent role in weight gain and obesity.

7. The time during which the child goes to sleep and the number of hours that the child sleeps also were among the factors that cause obesity in children.

8. The increase in obesity in recent years is due to the apparent lack of activity levels as a result of technological progress, which in turn was reflected in the increase in sitting and not moving as an inactive way of life prevalent in many societies.

9. Lack of exercise for everyone, especially children. Children who do not exercise are more likely to gain weight, because they don't burn many calories.

10. Spending a lot of time on static activities such as: watching TV or playing video games may contribute to weight gain and obesity, especially if accompanied by eating foods rich in calories.

11. It was found that the wrong health habits factor explains 34,306% of the total variance of the factors causing overweight and obesity in children, which includes age, weight, height and time during which the child goes to sleep, the child's possession of a mobile phone and the consumption of sweetened juices and soft drinks, while the social factor contributed by 12,277% Of the total variance, as it includes both the marital status of the mother and the position of the child within the family, the economic factor explained 9.954% and includes the variables of the family's economic situation and the work of the mother, while the medicine factor explained 9.185% of the total variance, and the percentage of the last factor represented by physical activity was 8.612% of the total variance.

4. Recommendations

1. Spreading a healthy culture in the community, especially among the family, to present healthy, balanced food and take care of the health of children.

2. Dedicating health programs through the media, seminars and training programs to clarify the risk of obesity in children and the possible health problems it may cause in the future.

3. The necessity of practicing a minimum daily physical activity in order to obtain the health benefits resulting from the practice of physical activity, and reduce the time the child spends watching television and sitting on electronic games.

4. Work to provide parks and safe places for walking and physical activity for children.

5. Ensure that the children sleep enough time and do not leave them awake for late hours at night.

6. Requiring schools to provide a sport class, especially in primary schools, for the child to practice physical activity and get rid of lethargy and laziness.

7. Conducting more research and studies in this regard in order to be able to address the increasing risk of obesity in children.

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