LETTER OF ACCEPTANCE

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We are pleased to inform you that your paper title "**Demographic characteristics of students with malnutrition diseases in Al-Mahaweel district for the year 2022-2023**" has been accepted for publication in the Journal of International Ethics and will appear in Volume 19, Issue No. 2, 2023 I take this opportunity to thank you for your interest in the GGE Center, and I wish you all the best in your future endeavors.

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Sirkku Hellsten

Demographic characteristics of students suffering from malnutrition in Mahaweel district for the year 2022-2023

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Abstract

The study aims to describe and analyze some elements of the population structure of students with the most prevalent health diseases among the groups of society, including primary education students whose ages range between (6-14) years, namely malnutrition diseases in the district of Mahaweel, and to identify their demographic characteristics represented by (the qualitative structure and age) for the infected students, revealing their prevailing health condition and showing the extent of its close association and relationship with the infection of the disease, as well as the changes that occur in the infection rates for each indicator of malnutrition diseases according to the time period specified for the study and for both sexes (males and females), as the total The total number of infected people is (494) cases distributed among the three disease indicators (wasting, stunting and obesity), where the incidence of wasting disease for males reached (103) cases, with a rate of (40)%, while the incidence of wasting disease for females reached (96) cases, with a rate of (40.5). The incidence of stunting among males was (85) cases, at a rate of (33%), while the incidence of females was (80) cases, at a rate of (33.7%), while the incidence of obesity in males was (69) cases, at a rate of (27%), and for females (61) cases with a rate of (25.8)% of the total study

population, where it is noted that the incidence of infection is higher for males than for females for social, health and nutritional reasons that males enjoy without females. year for wasting disease (87) cases, with a rate of (44)%, while the volume of In the age group (9-11) years, there were (66) cases, with a rate of (33)%. As for the age group (12 years and over), the number of infected people reached (46) cases, with a rate of (23)% of the total number of people infected with this disease. As for dwarfism, the number of infected people in the age group (6-8) years was (73) cases, with a rate of (44.2%), while the number of people infected with the age group (9-11) years was (53), with an infection rate of (32.1%). (12 years - and over), the number of infected people reached (39), with a rate of (23.7)% of the total number of people with dwarfism, and with regard to obesity, the number of infected people for the age group (6-8) years was (58) cases, with a rate of (44.6%), while it reached The number of infected people for the age group (9-11) years was (41) cases, with a rate of (31.5)%. As for the age group (12 years and over), the number of infected people was (31), with a rate of (23.9)% of the total number of people infected with this disease.

The introduction:

The incidence of the disease takes several dimensions and important demographic characteristics for the purpose of identifying and detecting it as a biological phenomenon of importance that requires studying the characteristics (quality and age) of its population infected with the disease in order to understand its nature, causes and factors contributing to its emergence and the infection of a specific group and not others, which helps in determining the spatial distribution of the prevailing health condition in society. However, the disease is not limited to affecting one sex or the other due to the difference in physiological and hormonal nature.

There are diseases that affect both sexes, but they affect one at a higher rate than the other, such as heart and blood vessel diseases, which are more common in males than females, and blood diseases that affect females more than males due to complications of pregnancy and childbirth[1].

Malnutrition is one of the most common health diseases among infants, children under the age of five, and those between the ages of 6 and 14, as a result of a clear deficiency in nutritional elements, including proteins and vitamins, which leads to a lack of nutrition and vital energy, leading to multiple forms of malnutrition, such as: (Wasting, stunting, weight loss, and protein deficiency). Therefore, in this aspect of the study, we will address the gender and age composition of those suffering from the most common and widespread malnutrition diseases in Al-Mahawil District for students, according to the time period of the study.

1 – Research problem

What is meant by the problem of the study is that it is a question that requires explanation and clarification, or an ambiguous position that has not been clarified or met [2] .

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[1] Amal Saleh Al-Kaabi, Medical Geography, 1st edition, Basra, 2011, p. 141

[2] Amer Ibrahim Qandilji, Scientific Research and Respect for Information Sources , House of Cultural , Affairs Press, Baghdad, 1993, p. 49.

The problem of the study revolves around knowing the demographic characteristics of primary school students in the Al-Mahawil district and explaining the role of geography in analyzing the gender and age variation of the population suffering from malnutrition diseases who are between the ages of (6-14) years, especially the students. Therefore, the problem of the study can be formulated in several questions, which are as follows:

1 - Do the gender and age composition have an impact on the difference in incidence of the disease?

2 - To what extent do demographic characteristics influence the increasing cases of malnutrition among the student population ?

2 - Research hypothesis

The hypothesis of the study represents the scientific method of systematic steps in formulating the art of intellectual organization of a series of multiple ideas [1].

It is noted that there is a clear discrepancy in cases of malnutrition (wasting, stunting, and obesity) according to their demographic characteristics (age and gender).

3 – Research objective

The researcher seeks to shed light on the demographic characteristics of the study population and its relationship to the incidence of malnutrition among the most important group of society in the study area, which is the group of school students in primary education who are aged (6-14) years. The most important objectives of the study can be defined as follows:

A - Determine the age groups of those suffering from malnutrition diseases that are the most common and widespread in the administrative units of the judiciary.

B - Knowing the increasing incidence of the aforementioned diseases according to the gender structure between males and females and knowing which of them is more infected in the study area.

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[1] **Ali Jawad Al-Taher, Literary Research Methodology, Beirut, undated, p. 15**

4 – (The importance of rearch)

They represent preliminary proposed solutions to study the research problem, justified by the researcher to find out the connection between causes and things[1]

The importance of the research emerged to demonstrate the role of geography in analyzing the disease phenomenon on a geographical basis and warning of the seriousness of the most widespread health diseases, which are malnutrition diseases, and their increasing spread among the educational community groups in the study area, whose indicators have been increasing in recent times.

5 – Research Approach

The scientific method represents a set of organized steps followed by the researcher in the art of organizing values from a series of sequential ideas

The researcher followed the descriptive method combined with the quantitative analytical method to study the behavior of pathological phenomena, relying on the data obtained through the field study of the study population.

6 - (Sources Research)

  The sources of data and information that the researcher relied on were numerous according to the nature of the study's axes and justifications to reach the desired goals, as follows:

A - Sources of data and information: The study relied on the sources provided by school health records for those suffering from malnutrition and school card records for student samples that were taken from schools affiliated with the study area.

B - Library sources: These are scientific theses, dissertations, modern books, scientific magazines and periodicals.

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(1) Mohsen Abdel-Sahib Al-Muzaffar, Spatial Research Techniques and Analysis , Dar Al-Safaa for Publishing and Distribution, Amman , 2007, pp. 35-36.

C - Field study: The field study focused on several axes, the most important of which are :-

1 - Getting to know the reality of students in general and those infected in particular through repeated visits to schools and direct observation of (skin, hair, nails and eyes colour), diagnosing cases suspected of being infected, reviewing information on the school card, and collecting information pertaining to the infected.

2 - Questionnaire: Here, a questionnaire form was prepared that contains several axes related to the respondents, and it was distributed according to the sample selected from the study population, and the information was collected, dispersed, and tabulated to be analyzed and the results benefited from.

3 - Visiting some government departments and institutions for the purpose of collecting data for the study community, including the Babylon Education Directorate, the Statistics Department, and the health sector in Al-Mahawil District for the purpose of reviewing the rates and numbers of infection cases annually, and the Central Bureau of Statistics to view the size of the population in the study area.

7 - Limits of research

The spatial boundaries of Al-Mahawil District are that it is located within the northern part of Babil Governorate, between latitudes (25-32) north and longitudes (20-44) east.

As for its geographical location, it is bordered to the south by the center of the city of Hilla, to the north by the Alexandria district of the Musayyib district, to the east by the Kuthi district, and to the west by the Al-Saddah district of the Musayyib district. It is about 20 km from the center of the Hilla district and about 80 km from the capital, Baghdad. Note map (1). Al-Mahawil District consists of three units: the district center, the Imam and Nile districts, and its affiliated villages, with an area of (965,901) km2, representing 18.2% of the total area of Babil Governorate, distributed according to administrative units. The area of the Al-Mahawil District center reached (286,171) km2, while The Nile district occupied 456,236 km2, which is the largest percentage in the district

Al-Imam district came in last place in terms of area, as it occupied (223,494) km2 of the area of the study area. Note Table (1) and Map (1). The time limits are represented by a study population of (45,300) students and a study sample size of 2% of the total study population of (906) students.
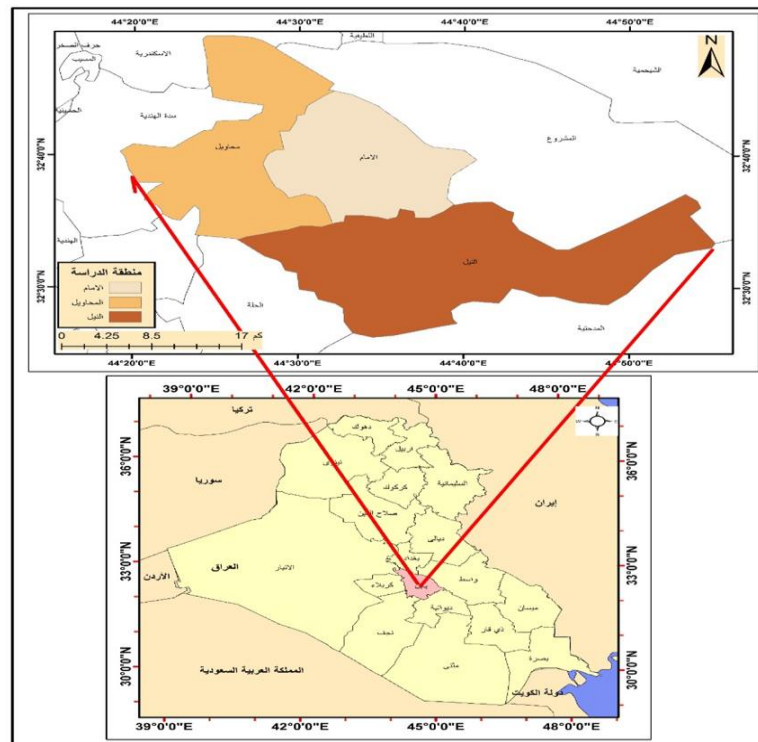
Table (1)

Area of Mahaweel District according to administrative units for the year 2023

Administrative unit	Area km2	Percentage to the governorate %
Mahaweel District Center	**286.171**	**5.4**
Nile District	**456.236**	**8.6**
Imam District	**223.494**	**4.2**
Total	**965,901**	**18.2**

Source: Iraqi Ministry of Planning, Babil Governorate Planning Department, 2022

Map (1)

Location of the study area in relation to Babil Governorate

Source: From the researcher's work based on data from Table (1)

First: The qualitative composition of students suffering from malnutrition in the study area for the year 2022-2023

Qualitative composition means the composition of the population by sex and its percentage in most of the peoples of the world that are not affected by counter-migration or incoming migration, to be close to one hundred or slightly less than it [1] . The percentage is extracted by dividing the number of males by the number of females and multiplying the result by one hundred [2]. Therefore, its importance appears on the economic, social and health aspects of the population infected with the disease .

It is necessary to point out the gender ratio in the study area so that we can know the qualitative demographic differences and changes that occurred between the last population census conducted in Iraq, which was the 1997 census, and the gender ratio for the study period in 2022. We will also study the differences and changes at the level of Babil Governorate and Iraq, where the number of males in The study area in 1997 was (86,134) people and the number of females was (95,926) people, with a sex ratio of (89) males for every 100 females. As for Babil Governorate, the number of males was (587,457) people and the number of females was (594,294) people, with a sex ratio of (98) males. For every female, and at the level of Iraq, the number of males according to the 1997 census was (10,987,252) people and the number of females was (11,058,992) people, with a sex ratio of (99) males for every hundred females. We notice from the above that the number of females exceeds the number of males. During this period, this makes the male gender ratio low for several reasons, including the period of the Iran-Iraq war (1987-1988). And the Gulf War in 1990, which led to a high death rate for males in addition to the missing and prisoners during this period, as well as external migration operations, which led to a decrease in the percentage of males, whether in the study area or at the governorate and Iraq level. As for the 2022 census or population estimates, the number of males reached The study area was (120,101) people and the number of

(1) Fathi Muhammad Abu Ayana, Population Geography, Foundations and Applications, 1st edition, University Knowledge House, Alexandria, 1993, p. 302.

(2) Fawzi Abd Sahawneh and Musa Abboud Samha, Population Geography, 2nd edition, Dar Wael for Publishing and Distribution, Amman, 2007, p. 56

females was (117,218) people, with a sex ratio of (102) males for every 100 females.

As for Babil Governorate, the number of males was (1,156,319) people and the number of females was (1,132,137) people, with a sex ratio. It reached (102) males for every hundred females, as for the level of Iraq

The number of males for the year 2022 reached (21,354,544) people and the number of females reached (20,894,338) people, with a gender ratio of (102) males for every 100 females. Here we notice that the relative increase for males is higher than for females, as is clear and completely different. Regarding the gender ratio for the 1997 census, for several reasons, including the return of immigrants after 2003, in addition to the high percentage of births for males compared to females, according to the statistics of the vital registry of births and deaths in Iraq, it is noted in Table (2) and Figure (1)

Table (2)
Relative distribution of the species percentage* for the study area, Babil Governorate, and Iraq for the year 1997 and 2022

Sex Ratio	Female	Male	Years
Study area			
89	95926	86143	1997
102	117218	120101	2022
Babylon Governorate			
98	594294	587457	1997
102	1,132,137	1,156,319	2922
Iraq			
99	11,058,992	10,987,252	1997
102	20,894,338	21,354,544	2022

Source: Ministry of Planning, Central Bureau of Statistics and Information Technology, Population Statistics Directorate, 1997 Census and Iraqi population estimates for the year 2022

*The species ratio was calculated according to the following equation :-

$$\text{Gender ratio} = \frac{\text{Number of males}}{\text{Number of females}} \times 100$$

Source : See: Abbas Fadel Al-Saadi, Population Geography, p. 395

Through the field study of the study area, we note from the data of Table (3) and Figure (2) that several observations show us about the qualitative composition of students suffering from malnutrition diseases at the level of Al-Mahawil district, which are as follows: Both genders are exposed to malnutrition diseases (males and females) equally, according to The incidence rate recorded in the field, and it is noted that the percentage of males infected with malnutrition diseases is higher in general compared to females and at the level of administrative units affiliated with the study area, with a rate of (52)% for males and (48)% for females. As for the detailed level of diseases, the number of males infected with the disease has been overwhelming. Wasting (103) cases reached a rate of (40)% of the male population, while the number of cases of infection among females reached (96) cases, a rate of (40.5)% of the female population. As for dwarfism, the number of infected males reached (85) cases of infection, a rate of (33)% and females (80) cases, with a rate of (33.7%), while the number of students infected with obesity in the study area reached (69) cases, with a rate of (27)%, and the number of females infected students reached (61) cases. An infection rate of 25.8% of all females in the study area. Note Table (3) and Figure (2).

Table (3)

Numerical and relative distribution of students suffering from malnutrition diseases by type in Al-Mahawil District for the year 2022 - 2023

Total injuries	The ratio%	Females	The ratio%	Male	the disease
199	40.5	96	40	103	Emaciation
165	33.7	80	33	85	Dwarfism
130	25.8	61	27	69	Obesity
494	100	237 48%	100	257 52%	the total

Source: From the researcher's work based on the questionnaire form, the first section

It is noted from the above during the study of the qualitative composition of students infected with malnutrition diseases in the study area, and according to the results produced by the field study, it was shown that the highest percentage of infected people is among males compared to females, as the total number of infected males reached (257) cases, with a rate of (52)%, and females (237 cases, with a rate of 48%. This is due to several reasons, including social reasons. Most families give males the right to choose food or drink, especially outside the home, as they enjoy the freedom to leave and enter at any time, completely unlike females, so they are not given the right to leave. Or eating outside the home as males do. In addition, some females acquire nutritional and healthy habits from their mothers because they stay with them in the house or the kitchen, unlike males who prefer quick-prepared or poorly cooked food in order to rush out to perform daily activities. Males are also exposed to diseases as a result of mixing. Excessive daily exercise, whether at school, in the street, when playing, or when eating outside the home, makes him more vulnerable to diseases , including malnutrition.

Figure (1)

Numerical and relative distribution of students suffering from malnutrition diseases by type in Al-Mahawil District for the year 2022 -2023
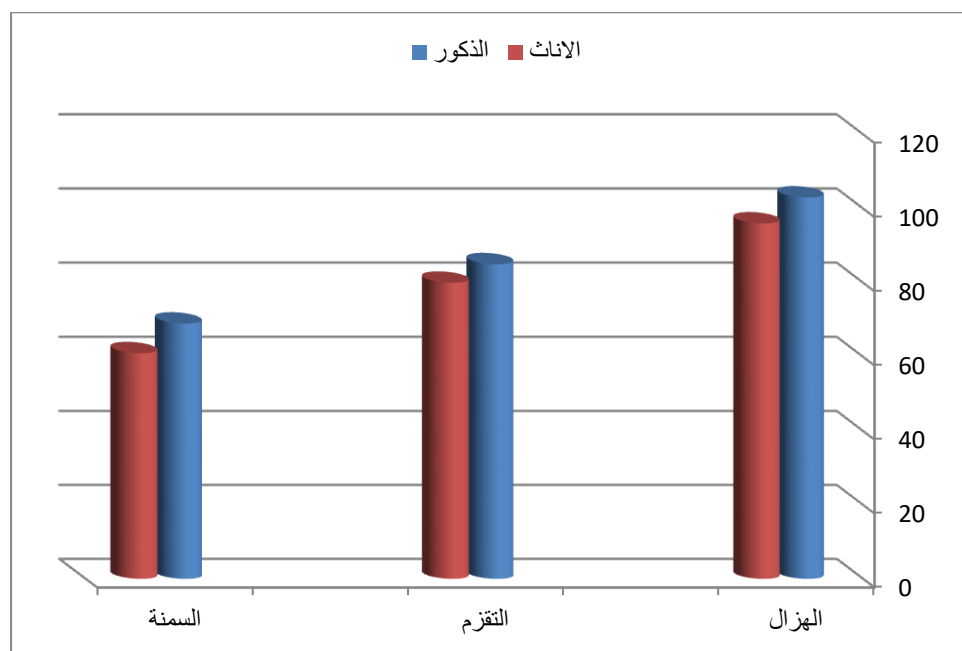
Source: From the researcher's work based on the data in Table (2)

Second : Age composition of students suffering from malnutrition in Al-Mahawil district for the year 2022-2023

Age composition means the distribution of the population affected by diseases according to their age groups, in a varying manner, to indicate the health status of those infected on the one hand and to indicate the extent of their vitality and physical activity on the other hand [1].

Through the field study, some facts were noted regarding those suffering from malnutrition diseases in the study area in terms of the recorded incidence in general, which are as follows :-

All age groups are exposed to malnutrition diseases (wasting, stunting, and obesity) in varying proportions. This is attributed to the diet among these groups, in addition to the quality of the food they eat in terms of specific deficiency in some food elements such as proteins and vitamins, and from the data in Table (3) and Figure (2). The extent of the infection and its percentage in relation to the disease indicators and age groups of the affected students becomes clear to us, as the incidence of wasting disease in the age group (6-8) years reached (87) cases, at a rate of (44)%, while the number of people infected with stunting in this group reached (73) cases. The infection rate reached (44.2)%. As for obesity, the number of infected people reached (58) cases, with a rate of (44.6) out of the total number of people infected with this disease. Next comes the age group of infected students (9 - 11) years, where the number of those infected with wasting disease reached (66). One case of infection reached a rate of (33)% of the total number of people infected with this disease, while the number of those infected with dwarfism reached (53) cases, an infection rate of (32.1)%. As for obesity, the number of those infected for this age group reached (41), an infection rate of (31.5)%. Of the total number of people infected with this disease, as for the last group (12 years and older), the number of people infected with wasting disease reached (46) patients, at a rate of (23)% of the total number of people infected with this disease, and the number of those infected with stunting within this age group of students reached (39) cases. An infection rate of 23.7%, while the number of infected people reached There were (31) cases of obesity, representing (23.9)% of the total cases of this disease.

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(1) Abbas Fadel Al-Saadi, Population Geography, pp. 738-739

Note Table (3) and Figure (2)

Numerical and relative distribution of students suffering from the most common malnutrition diseases according to age groups in Al-Mahawil District for the year 2022-2023

stunting		Obesity		Emaciation		age categories
%	the number	%	the number	%	the number	
44.6	58	44.2	73	44	87	**6 – 8 years**
31.5	41	32.1	53	33	66	**9 - 11 years**
23.9	31	23.7	39	23	46	**12 years - and more**
100	130	100	165	100	199	**the total**

Source: The researcher's work based on the results of the questionnaire

When analyzing the results of the above study and examining the percentages and numbers of age groups of infected students in the study area, we find the following:

The proportion of the age group (6-8) years ranked first in terms of the incidence of all indicators of malnutrition diseases, as the proportion of people infected with this group was wasting disease (44)%, stunting disease (44.2)%, and obesity disease (44.6%), and this is due to the fact that all Those who fall into this category are those from the first three stages of primary school whose diet changed between home and school, which had a negative impact on them, making the group most affected by malnutrition diseases.

   The age group (9-11) came in second place in terms of the percentage of cases of malnutrition, the most common disease in the study area, as the percentage of cases of wasting disease (33)%, stunting (32.1)%, and obesity (31.5)%, and in this age group it begins. Nutritional awareness or diet is increasing for the better and improving, because most people take the advice of their parents or school, which reduces the incidence of malnutrition diseases. As for the lowest rank in terms of the size of the infection, it is the age group (12 years and above) in terms of the rate of infections, so the rate of infection with wasting disease reached (The incidence of dwarfism was 23.7%, while the incidence of obesity was

23.9%. The reason for the decline in infection rates for this age group of students is the awareness of the real danger of worsening the crisis and health problems as a result of failure to adhere to healthy and correct diets. This is done by not overeating or skimping on meals for most of this age group.

Figure (2)

Numerical and relative distribution of students suffering from the most common malnutrition diseases according to age groups in Al-Mahawil District for the year 2022-2023
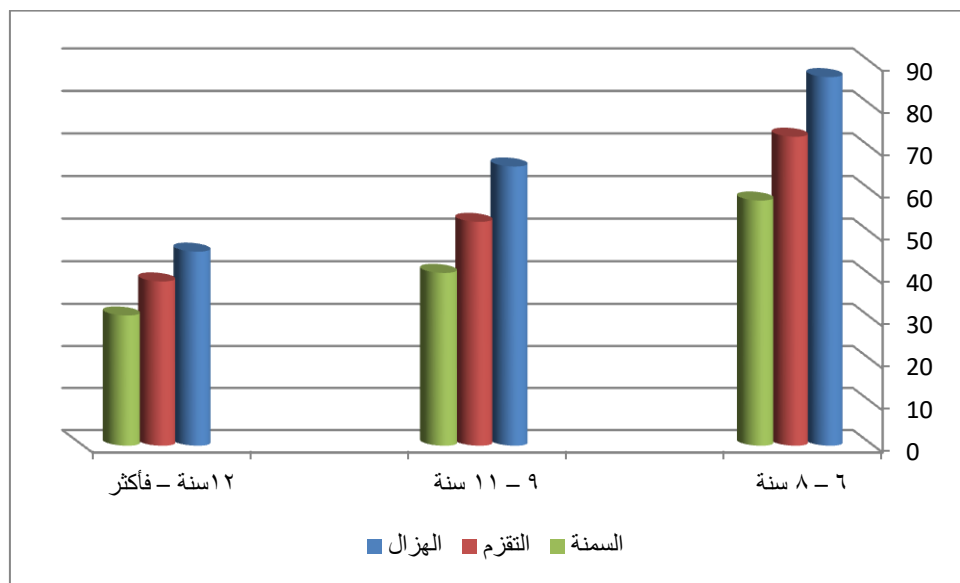
Source: The researcher's work based on the data in Table (3)

Conclusions

1 - There is a clear discrepancy in the gender ratio between the 1997 census and the population estimates for the year 2022 in the study area. In 1997, it reached (89) males for every hundred females, while in 2022 it reached (102) males for every hundred females. This indicates a significant increase in the proportion of males during The study period .

2 - The spread of wasting disease ranks first among students in the study area. The number of people infected with it reached (199) cases out of the total number of infected people in the community.

3 - Obesity comes in last place among the most common diseases in the study area, as the number of people infected with it reached (130) cases of infection from the community studied in the study area.

4 - It was proven through the study that the percentage of students most at risk of malnutrition in the study area are in the age group (6-8) years, where the infection rate reached (40.9)% of the total number of students, and this is a dangerous indicator for the most important age group of the population.

5 - Infection rates decrease as the student gets older, in order to increase his health and nutritional awareness on the one hand, and to demonstrate the family's influence on him through eating habits or home follow-up on the other hand. This is what the study showed, as the age group (12 years and above) ranked last in terms of infections with a volume of (116) cases of infection out of the total number of infected students.

6 - It was found through the study that the infection rate for males exceeds the infection rate for females, as it reached about 52% throughout the study area, while the rate for females was about 48% as a result of social and behavioral reasons in which males enjoy it more than females.

Recommendations

1 - The great interest of school administrations in following up on cases of diseases, especially malnutrition diseases and for the first age groups, because they do not realize the danger they face at this important age through improper nutrition or neglect of their health.

2 - Activating the role of health control for students through school health and coordination between health and educational institutions in following up on cases of infection among students and treating them, and before that by diagnosing and preventing the causes that lead to infection.

3 - Holding periodic workshops between the school health coordinator and parents, especially students who are injured or who suffer from health or nutritional problems, so that they can know how to confront and prevent future infections.

4 - Follow up on cases of infection with high rates that warn of danger, especially in males. It has been shown through the study that the infection rate for males is higher than the infection rate for females, and this calls for actual follow-up of them.

5 - Focusing on cases of infection within cities due to the factors that contribute to infection more than in the countryside, and following up on children, whether from families or from school administrations, on the type of food or drink they eat outside the home or inside school.

6 - Continuous communication by parents of students and creating a monthly or semi-monthly program to follow up on dangerous cases of infected students, such as excessive obesity, extreme thinness, or yellowing of the face as a result of protein deficiency, etc.

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